

August 5, 2010  
2CM022.017

Minto Explorations Ltd.  
Suite 900 – 999 West Hastings St  
Vancouver, BC V6C 2W2  
Canada

**Attention: Anne Labelle, Manager – Sustainability and Legal Affairs**

Dear Anne,

## **Minto Mine: Groundwater Baseline Conditions**

### **1.0 Requirements and Objectives**

Groundwater baseline conditions found at the Minto Mine site are discussed in this report. The report outlines the work done to date to assess the hydrogeological conditions that are currently observed at the mine site, and the potential impacts of proposed mine design on the hydrogeological system.

#### **1.1 Information Requirements**

In order to carry out an assessment of the baseline conditions at the site, a conceptual model of the groundwater flow system, and its interaction with receiving surface water bodies, is required. This conceptual model is used to assess the potential flow regime by mapping out the groundwater flow paths, gradients, and geological materials that the water will flow through. These data are used to estimate the volume, or flux of water flowing through the system, and the related impact of groundwater flow on surface water bodies.

#### **1.2 Monitoring Objectives**

A groundwater monitoring program was designed to collect baseline data and monitor potential effects from the open pits, underground workings, tailings facilities (in-pit and dry stack tailings facility (DSTF), and waste rock and overburden dumps at the Minto Mine site (Figure 1). The objective of the groundwater monitoring program is to provide background and on-going water quality data to serve as an early indication of potential impact of the mine on the local groundwater quality.

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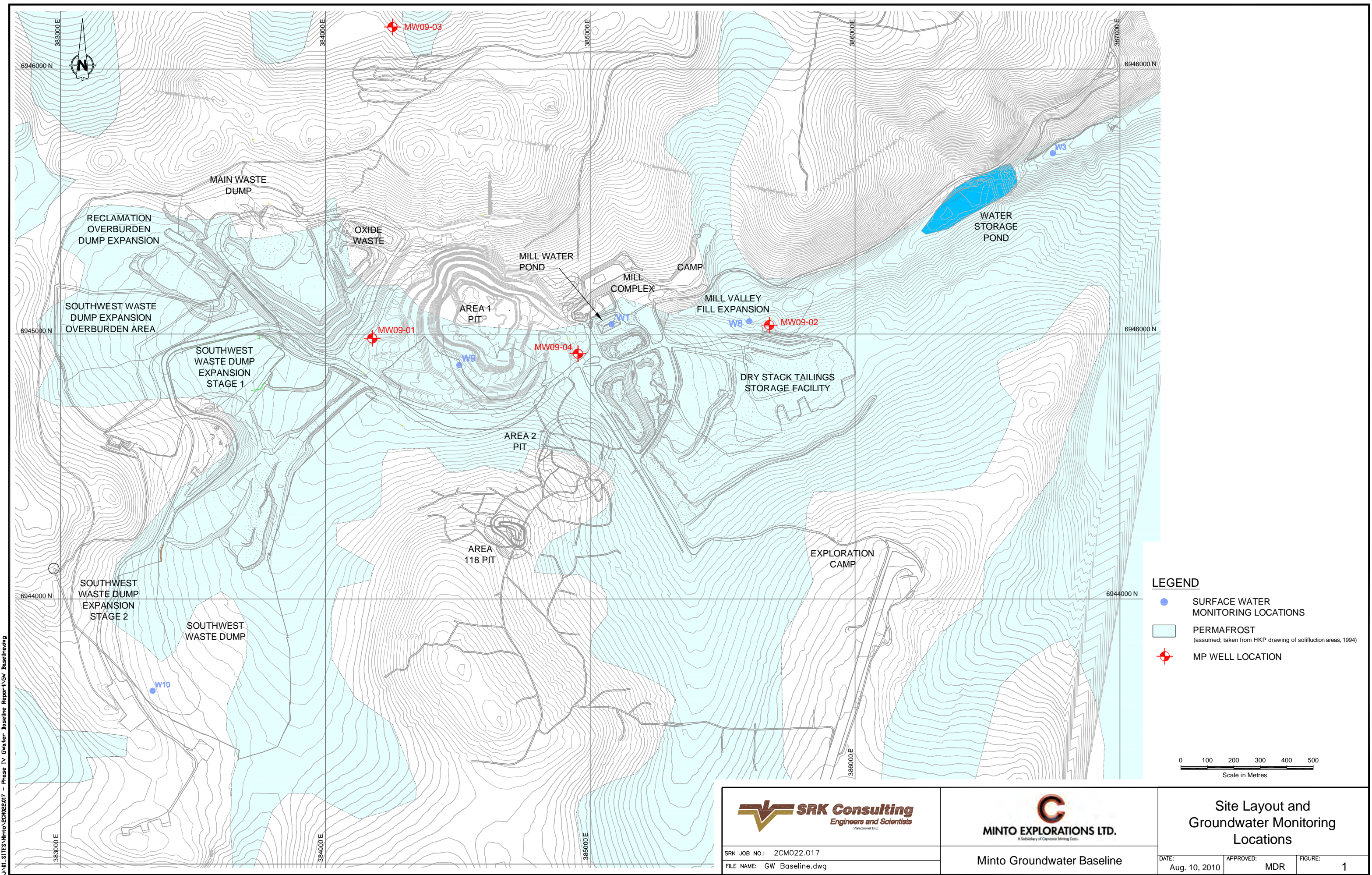
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Minto Groundwater Baseline

**Site Layout and Groundwater Monitoring Locations**

DATE: Aug. 10, 2010    APPROVED: MDR    FIGURE: 1



## 2.0 Hydrogeological Conditions

To establish baseline conditions, a groundwater monitoring program was carried out in the vicinity of the waste rock, overburden dumps, and the dry stack tailings facility (DSTF) at the Minto Mine site to provide background and on-going water quality data. The objective of the groundwater monitoring program was to provide an early indication of potential impact of the mine workings on the local groundwater quality.

Groundwater at the Minto site will be constrained to the overburden and bedrock flow systems. A complicating factor for monitoring groundwater at the site is the extent of permafrost at the site. The general hydrogeological characteristics are discussed below to give a clearer picture of the conditions that will affect the movement of groundwater on the site, and were used to prepare a conceptual model of the hydrogeological conditions.

### 2.1 Geology

#### 2.1.1 Overburden

Throughout the mine site the residual soils grade into weathered bedrock. The overburden soils thin out to the south and east of the DSTSF site.

Geotechnical investigations within the plan area of the dry stack tailings facility (DSTF), as reported in EBA, 2007, indicated overburden thicknesses of up to 45m. These deposits are thought to be an extension of an infilled valley, which also passes through the southern end of the open pit. The overburden soils generally comprise a thin veneer of peat and vegetation overlying a fine-grained silt or silt and sand of colluvium origin. The colluvium is underlain by coarse-grained sand with trace gravel that is considered to be a residual soil. The exception to this is at borehole 94-21, in which a clay layer from ground surface to a depth of 18-9m was observed (EBA, 2007).

Detailed soil logging by SRK in the area of the SW Dump (SRK, 2008) indicated that overburden material is comprised of silty, and in certain locations, clayey material, with fractions of sand, gravel and cobbles. Overburden thickness varies in this area (from 10.7m at 08SWC270 to 51.8m at 08SWC273). Typically, the overburden thickness increased along the valley bed, and decreased on the valley slopes. This is expected to be similar for overburden conditions across the project site.

#### 2.1.2 Bedrock

The Minto site is underlain by predominantly igneous rocks of granodiorite composition. Minor amounts of other lithologies consisting of small dykes of simple quartz-feldspar pegmatite, aplite, and an aphanitic textured intermediate composition rock are also observed. Bodies of all of these units are relatively thin and rarely exceed one metre core intersections. These dykes are relatively late, generally postdating the peak ductile deformation event; however, some pegmatite and aplite bodies observed in a rock cut located north of the mill complex are openly folded. Conglomerate and volcanic flows have been logged in drill core by past operators, but have not been recently confirmed as the drill core from previous campaigns was largely destroyed in forest fires and no new drilling has intersected such rocks.

With the possible exception of the lithological contacts of the dykes, the lithology types encountered in the Minto Mine site are not expected to have significant primary porosity as it relates to hydraulic conductivity (K) or transmissivity. The low K values (less than  $10^{-9}$  m/s), make it unlikely that significant groundwater flow will occur in competent bedrock. Flow may, however, occur in bedrock that has been fractured/faulted to produce open, secondary porosity/permeability.



Bedrock in the vicinity of the DSTF is located at approximately 45m depth (EBA, 2007). In general, outcrop exposure on the property is poor. Where exposure is available, it has been affected by deep weathering and variable oxidation, as the terrain was not glaciated during the last ice age event.

### 2.1.3 Structure

Secondary porosity/permeability is the dominant flow path in intrusive and metamorphic rocks. For this reason, it is important to have an understanding of the structural and mineralization environment of the site when constructing the conceptual flow model.

The copper-sulphide mineralization at Minto is strongly associated with foliated granodiorite within a deformation zone. The deformation zone forms sub-horizontal horizons within the more massive plutonic rocks of the region and can be traced laterally for more than 1,000 metres in the drill core. The similarity of chemistry and texture of both the deformed and the massive granodiorites suggest the deformation zones are structural in origin and not stratigraphic. The deformation zones are thought to represent healed, shallowly dipping faults that may have formed when the rocks passed through the brittle/ductile transformation zone in the earth's crust in transition from a deep emplacement environment to eventual exhumation of the regional batholith. Because of the inclusion of mineralization and the ductile nature of the main faulting at the site, these healed structures are not expected to represent significant flow paths.

Late, brittle fracturing and faulting is noted throughout the property area and is associated with a conjugate set of regional faults. The DEF Fault strikes more or less east-west and dips north-northwest and cuts off the main zone mineralization at its northern end. This type of faulting can often form significant flow paths within a rock mass. However; recent drilling results and data collected from instrumentation across the DEF fault in the north wall of the Area 1 Pit indicates that a significant hydraulic head is maintained across this feature (SRK, 2009 – unreported work in progress). This appears to indicate that the DEF is not a significant flow feature, but rather is holding back water flow across the structure. This characteristic; whereby, fault zones act as barriers to flow has been observed at other mine sites.

Current structural analysis of the site (SRK, 2009 - work in progress) indicates that faults of any sort are not expected to occur within the footprints of the waste and overburden dumps or DSTF.

## 2.2 Permafrost Conditions

Permafrost conditions on the site will make groundwater monitoring problematic. Permafrost on the site has been found to be extensive and deep (SRK, 2008). Data from drilling at several locations has shown permafrost ranging from depths from within 1.0m of ground surface to depths of up to 10 m.

Geotechnical drilling in 1994 and 1996 by EBA observed permafrost in each of the boreholes drilled within the vicinity of the proposed DSTSF (Figure 1), with the base of the permafrost occurring at varying depths (EBA, 2007). Measurements of the active layer in these areas indicated a maximum depth of only about 1.0 m in September 1996, directly under the DSTSF footprint.

The observed ice contents in boreholes downstream of the DSTF (94-11 and 94-21) and within the footprint of the DSTSF (96-G07 through -G12, excluding -G10), typically ranged from frozen ground to visible ice at 10% to 20% of the total volume. Two of the boreholes, 96-G09 and 96-G12, showed ice intervals of 1.5 and 4.0m thick respectively within the upper 10m.

Initial data from the ground temperature cables installed in 94-11, 94-21, and 96-G08 indicate a relatively uniform ground temperature of close to -0.8°C after equilibration with slight seasonal warming within the top 2 to 4 m. The active layer in 94-G11 and 94-G21 are on existing disturbed



trails, and so will be deeper than the surrounding soils. Readings from 2006 for 94-G11 indicate similar ground temperatures and active layer thickness.

In November 2007, vibrating wire piezometers were installed within and down gradient of the existing dry stack tailings storage facility (DSTSF) in boreholes DSP-1 and DSP-2. Each of these piezometers is equipped with temperature sensors at the piezometer tip. At both of the locations, the sensors were installed at 1 m and 1.7 m respectively. No pore water has been measured in the piezometers to date, as ground conditions have remained frozen.

In addition, three more temperature cables providing profile data were installed in the vicinity of the DSTSF in holes DST-1, DST-2, and DST-5. Initial observations from the piezometer temperature probes indicate that temperatures did not rise above  $-0.3^{\circ}\text{C}$  at any time and ranged as low as  $-2.6^{\circ}\text{C}$ . Temperature cable DST-5 (Figure 1) is located outside of the footprint of the DSTSF and provided a profile reflecting conditions on an un-insulated site. Temperature averaged approximately  $-0.5^{\circ}\text{C}$  below 1 m depth, and fluctuated near surface to values exceeding  $5^{\circ}\text{C}$ .

No groundwater was observed in any of the boreholes during the EBA geotechnical drilling program.

Soil investigation drilling in the region of the SW waste rock dump in February to April, 2008 (SRK, 2008), most cores contained non-visible ice, indicating the pore water was frozen; however, clear chunks of ice were also observed in many cases. Data from thermistors installed in the same drill holes indicate that this permafrost is close to  $0^{\circ}\text{C}$ ; however, water in any monitoring standpipes would freeze in the permafrost layer.

The results of the temperature and piezometer monitoring near the SW Dump through June 2008 suggest that unfrozen layers at depth may be limited or non-existent, and that shallow perched water tables within the seasonally thawed active layer may provide the only mechanism for transport within this region of the basin.

### 2.3 Historical and Existing Groundwater Monitoring

To date, groundwater monitoring has been installed under various initiatives, including:

- Installation of standpipes in 1994 at the proposed dam alignment (P94-20) and the pit vicinity (P93-E).
  - Water chemistry samples collected between 1994 and 2006
  - Water levels observed at ~15m and 26m depth in P94-20 and P93-E respectively
  - Both destroyed during construction and pit excavation, respectively, in 2006)
- Vibrating wire transducers down gradient of the DSTSF;
- Vibrating wire transducers in the dam core; and
- Standpipes installed during the SW dump foundation investigation.

Besides standpipes P93-e and P94-20, it appears that all standpipes installed on the site to date have frozen, indicating that permafrost conditions exist across most of the site at shallow depths.



## 2.4 Hydrogeological Implications of the Geological Model and Past Monitoring

The implications of the geology (overburden, lithology, and permafrost conditions) found at the Minto site and the past monitoring events are:

- Permafrost:
  - will dominate groundwater flow system below active zone to depths of up to 45m; and
  - Conventional “standpipe” monitoring wells installed through the permafrost into the underlying unfrozen ground will be inoperable as the piezometric levels will be near surface; therefore, the resulting water in them will freeze.
- Shallow flow:
  - will be dominated by permafrost conditions;
  - will occur in the seasonally thawed layer; and
  - will be controlled by overburden composition in the unfrozen areas.
- Deeper flow:
  - will occur below the permafrost within the bedrock;
  - will concentrate in the shallow, weathered zone if unfrozen; and
  - standpipe monitoring wells will not be an effective means of monitoring the deep groundwater system.

Based on this, we expect that groundwater flow related to the waste rock and overburden dumps and the DSTF will only have significant impact on the shallow, active layer system and will report to nearby surface drainages during times of thawed conditions. The deeper, bedrock hosted flow system is expected to be isolated from these facilities, due to the permafrost layer.

Groundwater flow may be impacted by the Area 1 and 2 pits, as well as the 118 Area underground mine, as these penetrate the permafrost and intersect the sub-permafrost groundwater system. However; the impact of these mine components will be controlled by the hydraulic conditions within the deeper bedrock, which is expected to be low K. Furthermore, due to the steep valley walls and location of the pits and underground workings near the Minto Creek catchment centre-line, an upwards gradient (as shown below in the assessment of monitoring data) is expected. Therefore, impact flow would likely report to surface rather than persist as deep groundwater flow.

## 3.0 Monitoring System Design and Operation

### 3.1 Monitoring Locations

To provide a means of monitoring potential impacts on the deep groundwater system, a series of multi-level monitoring wells capable of operating in permafrost conditions were installed in 2009. The wells were installed down gradient of the waste rock and overburden piles at the Main and South West Dump area, Area 1 Pit, North Pit, and DSTF. Monitoring well locations are presented in Figure 1.

All monitoring systems were installed outside the final design footprint of the waste rock and overburden piles, pits, and the DSTF as proposed at the time of installation. Consequently, the installation below the DSTF will need to be changed due to the proposal for the valley fill material placement. This is discussed later in the report. Appropriate monitoring points should be determined for the expanded waste rock dumps proposed in the Phase IV mine plan.

### 3.2 Monitoring Equipment

Multilevel MP System groundwater monitoring systems manufactured by Westbay Instruments (part of Schlumberger Water Services) were installed for the monitoring system. These systems consist of closed PVC pipe that has multiple valved sampling ports that are hydraulically separated using individually inflated external packers. The pressure and water sampling is carried out using a



wireline tool system that opens each monitoring zone valve independent of the others, and measure pressures and collects a sample from that zone only. The advantage that the MP System has over other monitoring systems is that, because it is a closed pipe system, it can be operated using anti-freeze inside the pipe to allow for access through the permafrost zone. Currently, this system is used at other mine sites with permafrost conditions in the NWT (Giant Mine, Ekati Mine, and the Hope Bay project) and northern Ontario (Victor Mine), and is deemed the only practical means of long-term groundwater monitoring through permafrost. Details of the monitoring equipment are given in the installation report (Appendix A) and the sampling report (Appendix B).

As well as pressures and groundwater samples, the system can also be used for hydraulic testing. All of the monitoring and sampling methods have been used extensively on mine sites, as well as contaminated waste sites, in Canada, the USA, and many other countries around the world, and are considered to meet the requirements for sampling for low level parameter concentrations.

### 3.3 Groundwater Sampling

#### 3.3.1 Monitoring Parameters and Sampling Schedule

Monitoring of the groundwater network will occur on a quarterly basis as laid out in Table 1. The monitoring and sampling frequencies are based upon conditions encountered in the initial sampling rounds.

Groundwater samples collected will be analyzed for the parameters shown in Table 1.

**Table 1: Sample Parameters and Monitoring Frequency for Groundwater and Ground Temperature**

Monitored Item	Parameters	Frequency
Groundwater Sample	Conductivity, total dissolved solids, hardness, pH, total suspended solids, dissolved anions, nutrients, cyanides, total metals (trace), dissolved metals (trace).	Quarterly
Piezometric Levels	Water Pressure	Quarterly
Ground Temperatures	Temperature	Quarterly

The groundwater monitoring program would be carried out on a scheduled basis until dumps and tailings facility are reclaimed and the mine site has been closed.

#### 3.3.2 Sampling Protocol

Groundwater samples were collected using best practice methods. Standard SRK sampling procedures are provided in as an appendix in the appended sampling reports (Appendix A and B).

### 3.4 Hydraulic Response Testing

Hydraulic response testing has not been carried out during drilling programs to date. However, these tests can be carried out using the MP System and will be part of the ongoing monitoring program. During installation and initial testing of the MP System, quality assurance (QA) testing of the zones indicated that hydraulic conductivity of all zones was less than  $1 \times 10^{-9}$  m/s based on the time for recovery from pulse testing (designed to test packer seal integrity).

### 3.5 Monitoring Program Reporting

Reporting on the findings from the groundwater monitoring plan will be submitted as a component of the Water Use Licence Annual Report. This will include both raw data collected and an interpretive discussion of groundwater quality, elevations and temperature profiles at the monitored locations. An assessment of groundwater flow paths will be made, with a review of suitability of the

monitoring locations based on piezometric levels, thermal data, and changes to the geological model as they become available.

Groundwater monitoring reporting would consist of the following:

- a. Monitoring system installation and initial sampling report consisting of:
  - i. Detailed field report to document the locations and ground conditions at all monitoring points, methods of installation, equipment specifications, and results of initial sampling and hydraulic testing; and
  - ii. Initial water quality results.
- b. Annual monitoring reports:
  - i. Compilation of all monitoring data collected during the reporting period;
  - ii. Analysis and assessment of data; and
  - iii. Recommendations for changes to the monitoring system if and when deemed necessary.

## **4.0 Baseline Conditions**

### **4.1 Groundwater Flow System**

Groundwater flow at the site is expected to mimic the steep topography, with influences from the mine infrastructure during dewatering operations. Pressure data from the three multilevel wells are illustrated on Figure 2, and in plan view on Figure 3.

Measured piezometric data from MW09-04 are not available as this well was damaged prior to initial monitoring; however, the static water level in the open hole prior to installation of the monitoring equipment was approximately 4 m below ground surface. The water level seems to be reasonable based on the depth of permafrost observed (ice observed in the core to 44m depth) and the location relative to the Area 1 Pit. This is also illustrated on Figure 3.

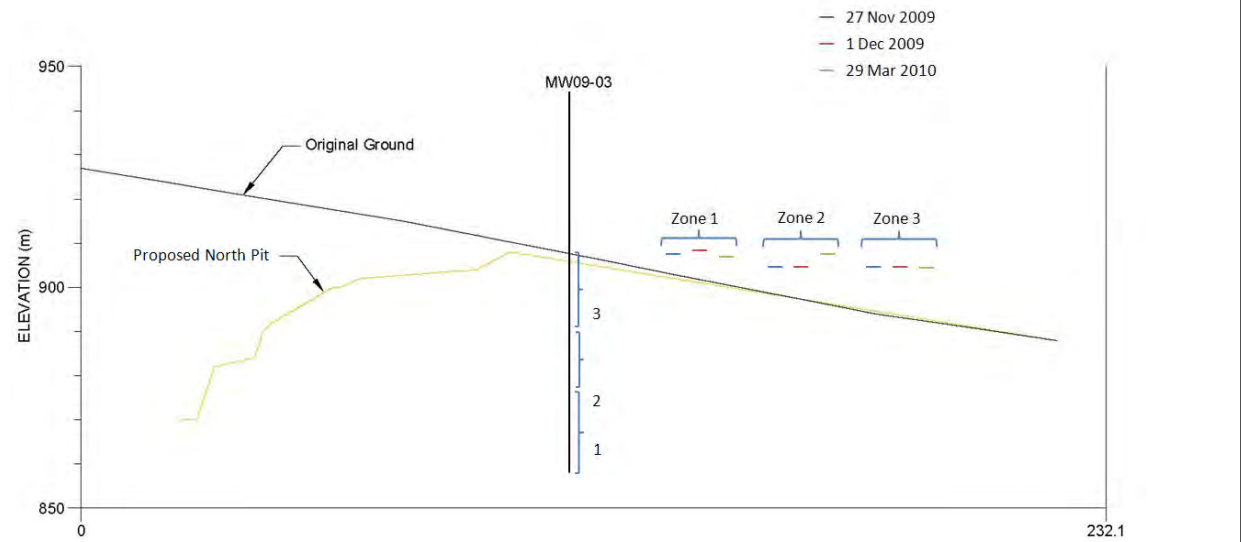
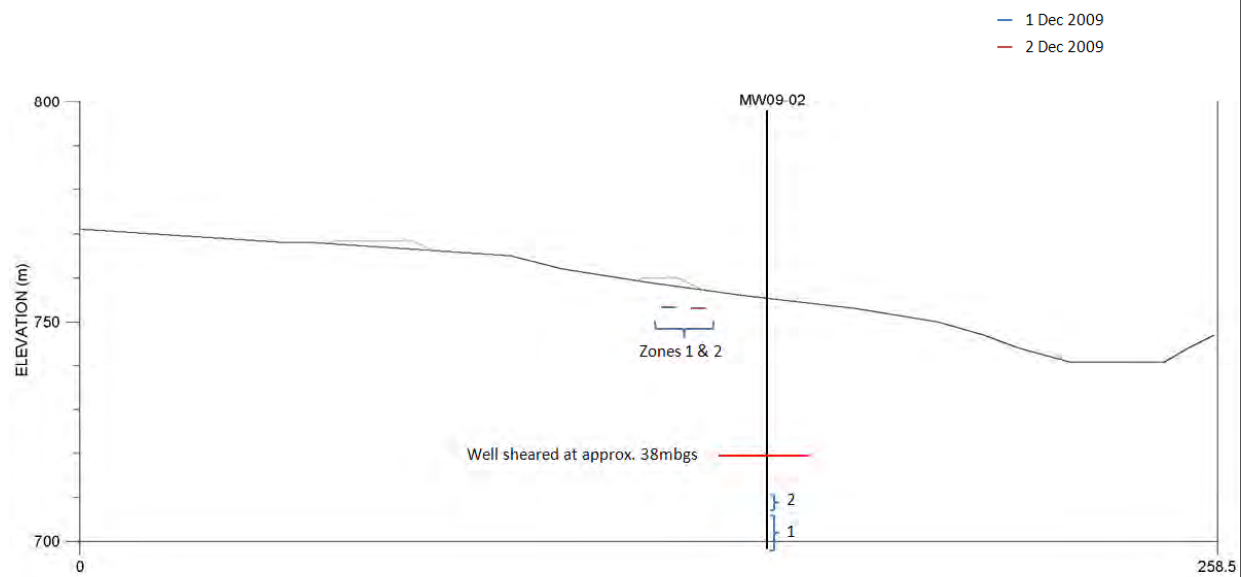
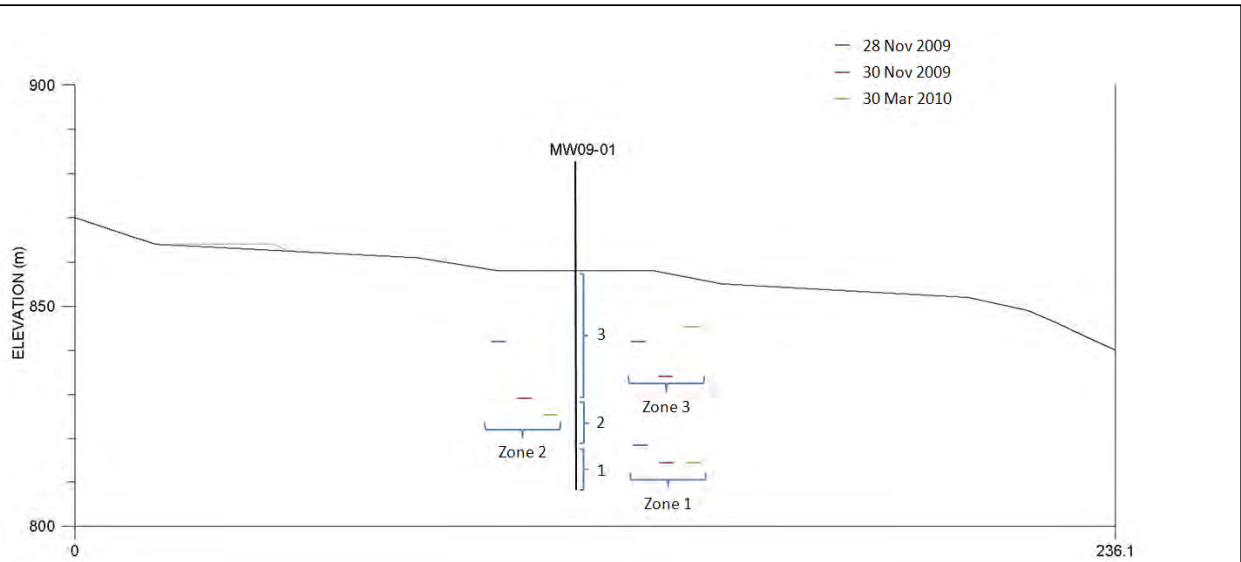
Based on the water levels and gradients observed, the expected flow directions on the site are illustrated on Figure 3. All groundwater is expected to report to the Minto Creek as direct discharge, as illustrated in both long section on Figure 4 (section line position shown on Figure 3) and in typical cross section view also on Figure 4.

The flow lines are drawn to illustrate the decreasing flux (volume) of flow that will occur with increasing depth in the bedrock. The change in flux is caused by the decreasing hydraulic conductivity found in this type of hydrogeological system, related to higher lithostatic pressure closing open fractures, etc as depth increases.

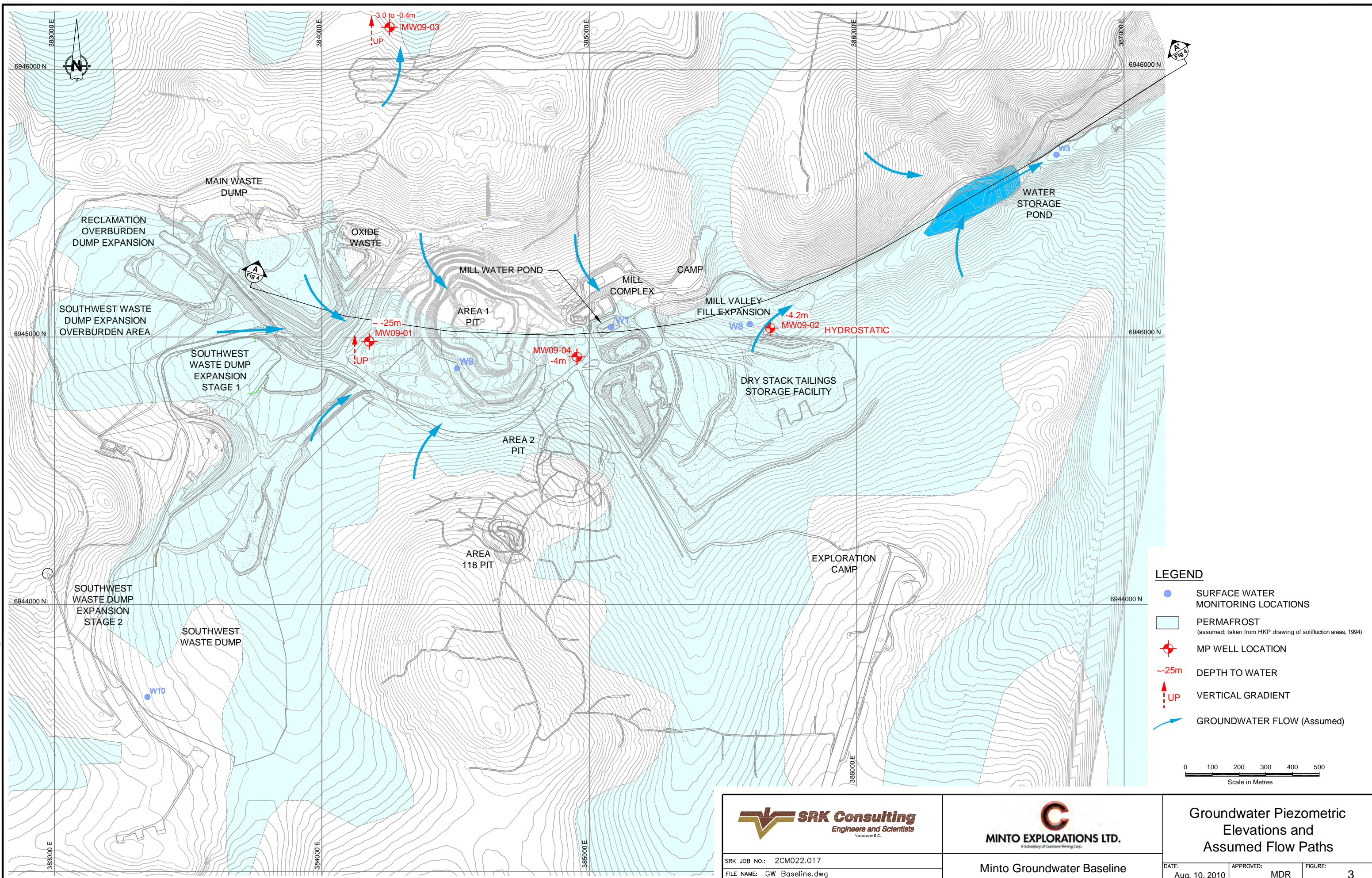
Upwards gradients from the steep valley walls discharging to the creek along the Minto Creek alignment, plus the reduced infiltration in the northern slopes due to permafrost are also illustrated in the cross section.

A long section through the site from roughly west to east, taking in the main mine infrastructure and natural components of the site is illustrated in Figure 4. The section has the monitoring wells superimposed on it, as well as the general outline of the open pits, underground workings, and waste rock dumps in order to illustrate how each of these will interact with the main drainage (Minto Creek) and the regulated surface water monitoring compliance point (W3).









**LEGEND**

- SURFACE WATER MONITORING LOCATIONS
- PERMAFROST (assumed; taken from HKP drawing of solifluction areas, 1994)
- ⊕ MP WELL LOCATION
- ~25m DEPTH TO WATER
- ↑ UP VERTICAL GRADIENT
- GROUNDWATER FLOW (Assumed)

0 100 200 300 400 500  
Scale in Metres

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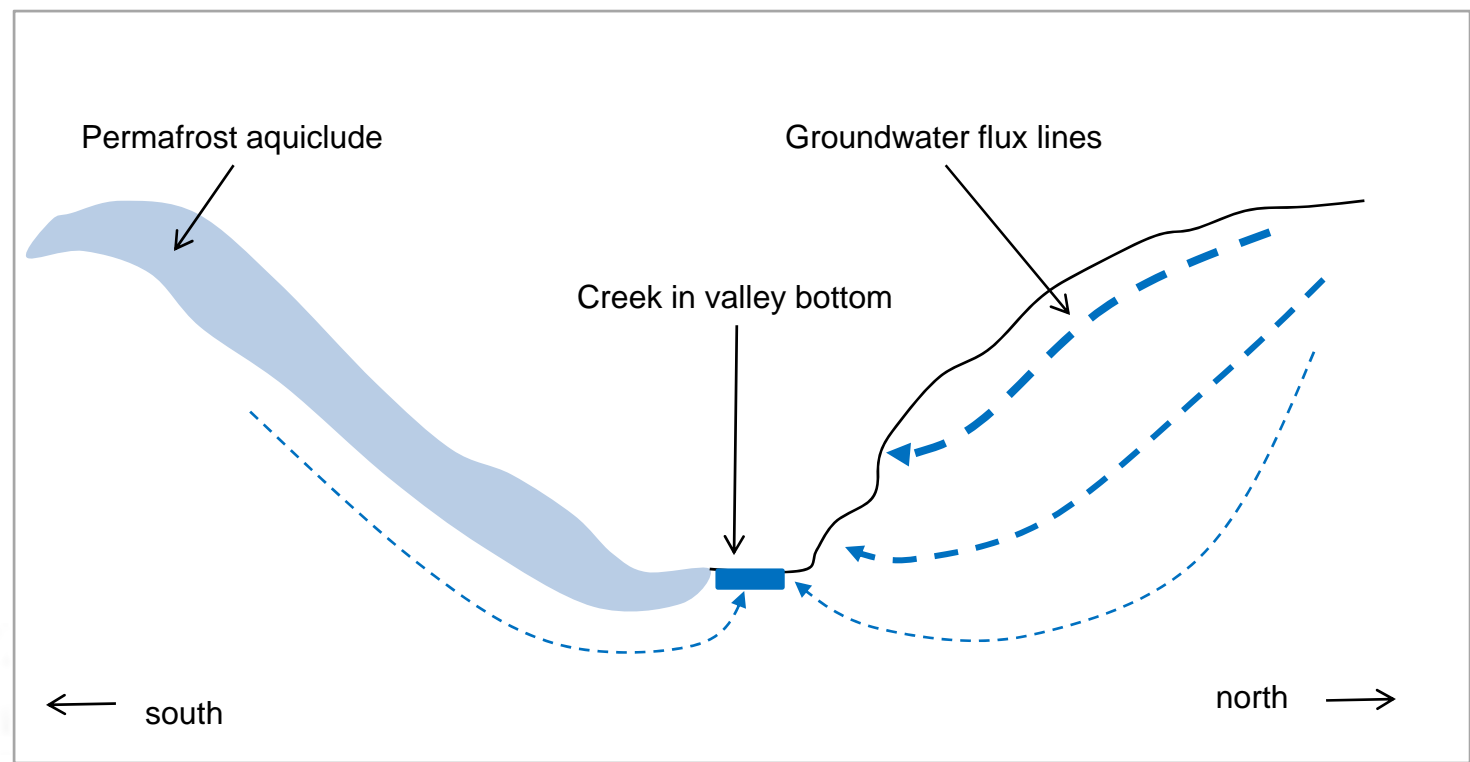
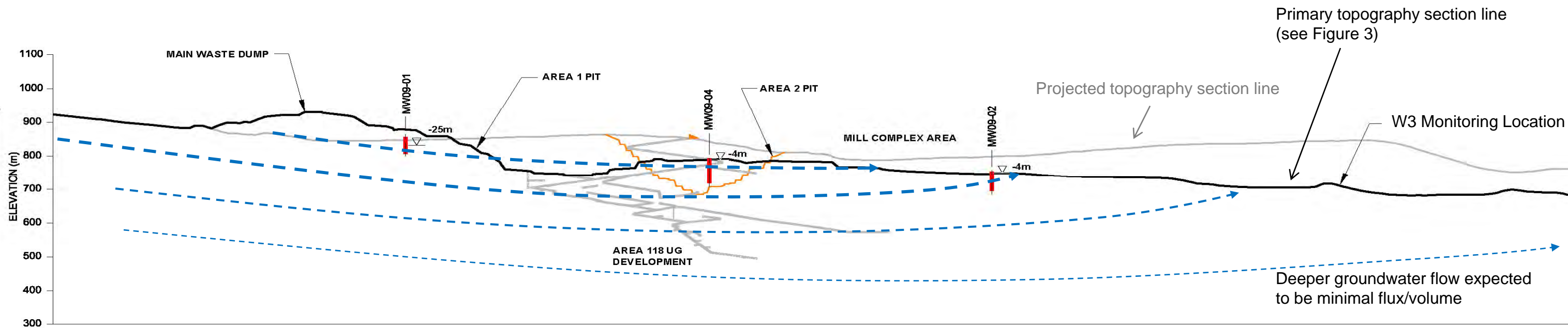
**Groundwater Piezometric Elevations and Assumed Flow Paths**

DATE: Aug. 10, 2010    APPROVED: MDR    FIGURE: 3

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# Long Section




Cross Section (exaggerated)

### Legend

- | MP well (projected onto cross section)
- Permafrost
- Groundwater flow line (assumed)

Note: Flow lines assume pits have been backfilled with tailings and all mine workings reflooded to static water levels



 <b>SRK Consulting</b> <small>Engineers and Scientists</small> <small>National Pty. Ltd.</small>	<b>MINTO EXPLORATIONS LTD.</b>	Schematic Section of Minto Mine Site	
	Minto Groundwater Baseline	DATE: Aug. 10, 2010	APPROVED: MDR

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## 4.2 Hydrogeochemistry

Groundwater samples were collected from the multilevel monitoring wells in December 2009 and April 2010 (see Appendix A and B for details on well development and sampling). Results of the sampling are given in Table 2, and summarised in Figure 5 to Figure 12, are compared to the mean annual site background water quality (Minnow, 2010), as shown in the plots as a means of benchmarking the hydrogeochemistry for potential loading influence on the surface water bodies.

As can be seen in Figure 5 and Figure 6, the groundwater chemistry is quite similar to the mean annual values in all sample zones, and that samples collected in December 2009 and April 2010 show little variation. The latter indicates that the zones were properly developed in the initial sampling round and that representative samples were collected.

Samples were also analysed for metals concentrations. All samples were analysed for both total and dissolved metals (see detailed lab analysis in Appendices A and B). However, although Total and Dissolved metals results are usually similar (indicating low suspended load in the samples), only dissolved species are presented in this report as these will be more representative of actual groundwater conditions as suspended particles in monitoring well samples are due to drill and well construction, not actual particulate matter moving through the groundwater system.

Results of the metals analysis (aluminum, cadmium, copper, iron, manganese, and selenium) are shown in Figure 7 to Figure 12. All samples show little variation (significantly less than 1 order of magnitude) and compare reasonably with the mean annual concentrations. This appears to indicate that the baseline groundwater chemistry is not significantly different than the baseline surface water chemistry on the site.

The results also indicate that metals concentrations also did not change significantly, so it is assumed that representative samples were collected in both sampling rounds. This also indicates that it would be reasonable to assume that the initial sampling results obtained from the destroyed well (MW09-02) represent groundwater chemistry with little to no impact from drilling and installation, so can be used for baseline assessment purposes.



Table 2: 2009 - 2010 Grounwater Quality Results

2009 Groundwater Quality Data

Parameter	Units	Well-Zone								
		MW09-1			MW09-2		MW09-3			
		MW09-1-2	MW09-1-3	MW09-1-3-D	MW09-2-1	MW09-2-1-D	MW09-3-1	MW09-3-2	MW09-3-2-D	MW09-3-3
Date	30-Nov-09	30-Nov-09	30-Nov-09	2-Dec-09	2-Dec-09	1-Dec-09	1-Dec-09	1-Dec-09	1-Dec-09	
<b>Physical Properties</b>										
pH	pH units	8.03	8.02	8.06	7.95	7.95	7.94	7.91	7.92	7.8
Conductivity	uS/cm	729	725	728	1090	1090	976	932	947	158
TDS	mg/L	528	364	442	814	812	652	626	672	110
TSS	mg/L	7	92	66	30	31	399	146	96	21
<b>Misc. Parameters</b>										
Alkalinity - Bicarbonate	mgCaCO3/L	140	100	100	400	410	100	100	100	70
Alkalinity - Carbonate	mgCaCO3/L	<6	<6	<6	<6	<6	<6	<6	<6	<6
Alkalinity - Hydroxide	mgCaCO3/L	<5	<5	<5	<5	<5	<5	<5	<5	<5
Alkalinity - Total	mgCaCO3/L	112	100	100	329	333	93	85	81	55
Hardness	mgCaCO3/L	318	262	274	503	508	253	242	255	60
Turbidity	NTU	1.1	32	26	13	16	95	49	47	6.9
Chloride	mg/L	7.22	7.28	7.27	5.52	5.73	17.9	16	16.3	0.93
Nitrogen as NH4	mg/L	0.72	3.85	3.03	1.29	1.26	5.79	5.32	5.6	0.26
Nitrogen as NO23	mg/L	42.9	42.1	42.1	23.2	24.4	60.9	58.2	59.7	1.87
Total Kjeldahl Nitrogen	mg/L	6.79	6	6.21	1.13	1.01	11.7	12.2	11.6	0.34
Phosphate (total)	mg/L	0.04	0.03	0.03	0.06	0.06	0.03	0.03	0.03	0.04
Sulphate (dissolved)	mg/L	77.4	82.5	83.3	166	170	117	110	115	10
<b>Dissolved Metals</b>										
Aluminium	mg/L	0.006	0.007	<0.005	0.01	<0.005	0.01	0.008	0.007	0.007
Antimony	mg/L	0.0053	0.0032	0.0008	0.0136	0.003	0.002	0.0021	0.0034	0.0021
Arsenic	mg/L	0.0002	0.0002	0.0003	0.0041	0.0047	0.0009	0.0008	0.0005	0.0002
Barium	mg/L	0.034	0.1	0.095	0.11	0.111	0.106	0.088	0.091	0.011
Berillium	mg/L	<0.00004	<0.00004	<0.00004	<0.00004	<0.00004	<0.00004	<0.00004	<0.00004	<0.00004
Bismuth	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	mg/L	0.045	0.052	0.044	5.37	6.09	0.32	0.218	0.2	0.044
Cadmium	mg/L	0.00005	0.00008	0.00007	0.00009	0.00006	0.0002	0.00008	0.0001	0.00007
Calcium	mg/L	89.7	75.4	78.2	98.2	99.2	74.1	73.7	77.6	19.9
Chromium	mg/L	<0.0004	<0.0004	<0.0004	0.0036	0.0038	<0.0004	<0.0004	<0.0004	<0.0004
Cobalt	mg/L	0.00102	0.00076	0.00078	0.00065	0.00062	0.00045	0.00057	0.00054	0.00024
Copper	mg/L	0.012	0.02	0.018	0.004	0.003	0.019	0.022	0.022	0.005
Iron	mg/L	0.05	0.04	0.04	0.11	0.09	0.03	0.02	0.02	0.02
Lead	mg/L	0.0001	<0.0001	<0.0001	0.0002	0.0002	0.0002	0.0001	<0.0001	0.0001
Lithium	mg/L	0.001	0.003	0.003	0.011	0.01	0.012	0.011	0.011	0.001
Magnesium	mg/L	22.9	18	19.1	62.6	63.1	16.5	14.2	14.9	2.4
Manganese	mg/L	0.0802	0.228	0.189	0.27	0.261	0.161	0.135	0.137	0.0184
Mercury	ug/L	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
Molybdenum	mg/L	0.0341	0.0892	0.0733	0.0442	0.0487	0.0806	0.101	0.104	0.0267
Nickel	mg/L	0.004	0.002	0.002	0.004	0.003	0.008	0.004	0.004	0.002
Phosphorus	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01
Potassium	mg/L	3.2	6.6	5.8	8.2	8.4	27	26	25	2.6
Selenium	mg/L	0.0028	0.0028	0.003	0.0067	0.0068	0.008	0.0067	0.0068	<0.0006
Silicon	mg/L	4.37	2.87	3.36	6.88	6.94	2.49	2.54	2.58	4.2
Silver	mg/L	0.00019	<0.00001	0.00002	<0.00001	<0.00001	0.00005	0.00004	0.00005	0.00001
Sodium	mg/L	16.8	28	26.2	70.4	74.2	70.5	63	66.8	5.5
Strontium	mg/L	1.04	1.51	1.39	2.11	2.14	2.21	1.86	1.91	0.168
Sulfur	mg/L	25.8	27.5	27.8	55.4	56.7	39	36.7	38.4	3.4
Tellurium	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Thallium	mg/L	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Thorium	mg/L	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
Tin	mg/L	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	0.0002	0.0002	<0.0001	<0.0001
Titanium	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Uranium	mg/L	0.0029	<0.0004	0.0008	0.0038	0.0039	0.001	0.0008	0.0008	<0.0004
Vanadium	mg/L	0.0002	0.0001	0.0001	0.0011	0.0012	0.0002	0.0001	0.0001	0.0002
Zinc	mg/L	0.009	0.006	0.004	0.01	0.007	0.022	0.01	0.014	0.012
Zirconium	mg/L	<0.0001	0.0001	<0.0001	0.0001	0.0001	0.0001	<0.0001	<0.0001	<0.0001
<b>Total Metals</b>										
Aluminium	mg/L	0.141	1.46	1.02	1.03	0.765	15.3	3.85	2.62	0.681
Antimony	mg/L	0.0003	0.0012	0.0003	0.003	0.0038	<0.001	0.0008	0.0032	0.0025
Arsenic	mg/L	0.0003	0.0009	0.0007	0.0053	0.005	0.0068	0.0007	0.0006	<0.0002
Barium	mg/L	0.037	0.138	0.122	0.136	0.132	1.35	0.183	0.16	0.028
Berillium	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001
Bismuth	mg/L	0.046	0.068	0.048	6.18	6.25	0.514	0.25	0.228	0.064
Boron	mg/L	<0.00004	<0.00004	0.00004	0.00004	<0.00004	0.00066	0.00008	0.00004	<0.00004
Cadmium	mg/L	0.00004	0.00008	0.00008	0.00017	0.00016	0.00012	0.00013	0.00011	0.00008
Calcium	mg/L	85.9	73.2	70.9	96	95.1	85.5	74	74.4	20.4
Chromium	mg/L	0.0011	0.0052	0.0037	0.006	0.0054	0.003	0.002	0.0016	0.0013
Cobalt	mg/L	0.00109	0.00156	0.00145	0.00144	0.00121	0.00175	0.00147	0.00128	0.00027
Copper	mg/L	0.015	0.04	0.035	0.013	0.01	0.056	0.047	0.042	0.01
Iron	mg/L	0.324	2.68	1.65	1.76	1.28	44	4.93	3.47	0.673
Lead	mg/L	0.0001	0.0007	0.0005	0.0008	0.0006	0.004	0.0008	0.0006	0.0002
Lithium	mg/L	0.001	0.005	0.004	0.013	0.013	0.02	0.012	0.012	0.001
Magnesium	mg/L	22	18	17.8	62.2	61.9	21.8	14.6	14.6	2.54
Manganese	mg/L	0.0935	0.309	0.248	0.34	0.332	6.78	0.287	0.256	0.0384
Mercury	ug/L	0.05	<0.01	0.02	<0.01	<0.01	0.02	0.02	0.02	0.01
Molybdenum	mg/L	0.0356	0.0944	0.0758	0.0481	0.0499	0.0742	0.108	0.114	0.0288
Nickel	mg/L	0.004	0.005	0.004	0.006	0.005	0.01	0.005	0.005	0.002
Phosphorus	mg/L	<0.05	0.06	<0.05	<0.05	<0.05	0.19	0.07	0.05	<0.05
Potassium	mg/L	3.3	7.2	5.9	8.6	8.3	31	25.2	25.2	3
Selenium	mg/L	0.0029	0.0032	0.0031	0.0072	0.0073	0.011	0.0078	0.0077	0.0007
Silicon	mg/L	4.54	7.01	5.12	9.32	8.46	38.1	9.99	7.55	5.49
Silver	mg/L	0.00037	0.00013	0.00013	0.00024	0.00019	0.0104	0.00613	0.00377	0.00154
Sodium	mg/L	16.7	28.1	23.6	73.4	71.5	65.4	66.1	66.7	5.72
Strontium	mg/L	1.27	1.84	1.64	2.55	2.53	2.41	2.17	2.31	0.189
Sulfur	mg/L	27.6	28.5	28.2	60.5	59.9	41	39.1	39.8	3.8
Tellurium	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0001	<0.0001	<0.0001
Thallium	mg/L	<0.00001	0.00002	0.00001	0.00001	<0.00001	0.00016	0.00002	0.00002	<0.00001
Thorium	mg/L	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.002	<0.0004	<0.0004	<0.0004
Tin	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	0.0003	0.0002	<0.0001
Uranium	mg/L	0.0032	0.0004	0.0008	0.0045	0.0044	0.002	0.0009	0.001	<0.0004
Vanadium	mg/L	0.0006	0.0046	0.0033	0.0036	0.0029	0.039	0.0065	0.005	0.0012
Zinc	mg/L	0.007	0.029	0.019	0.024	0.018	0.13	0.036	0.033	0.033
Zirconium	mg/L	0.0002	0.0006	0.0004	0.0004	0.0004	0.0006	0.0004	0.0004	0.0001

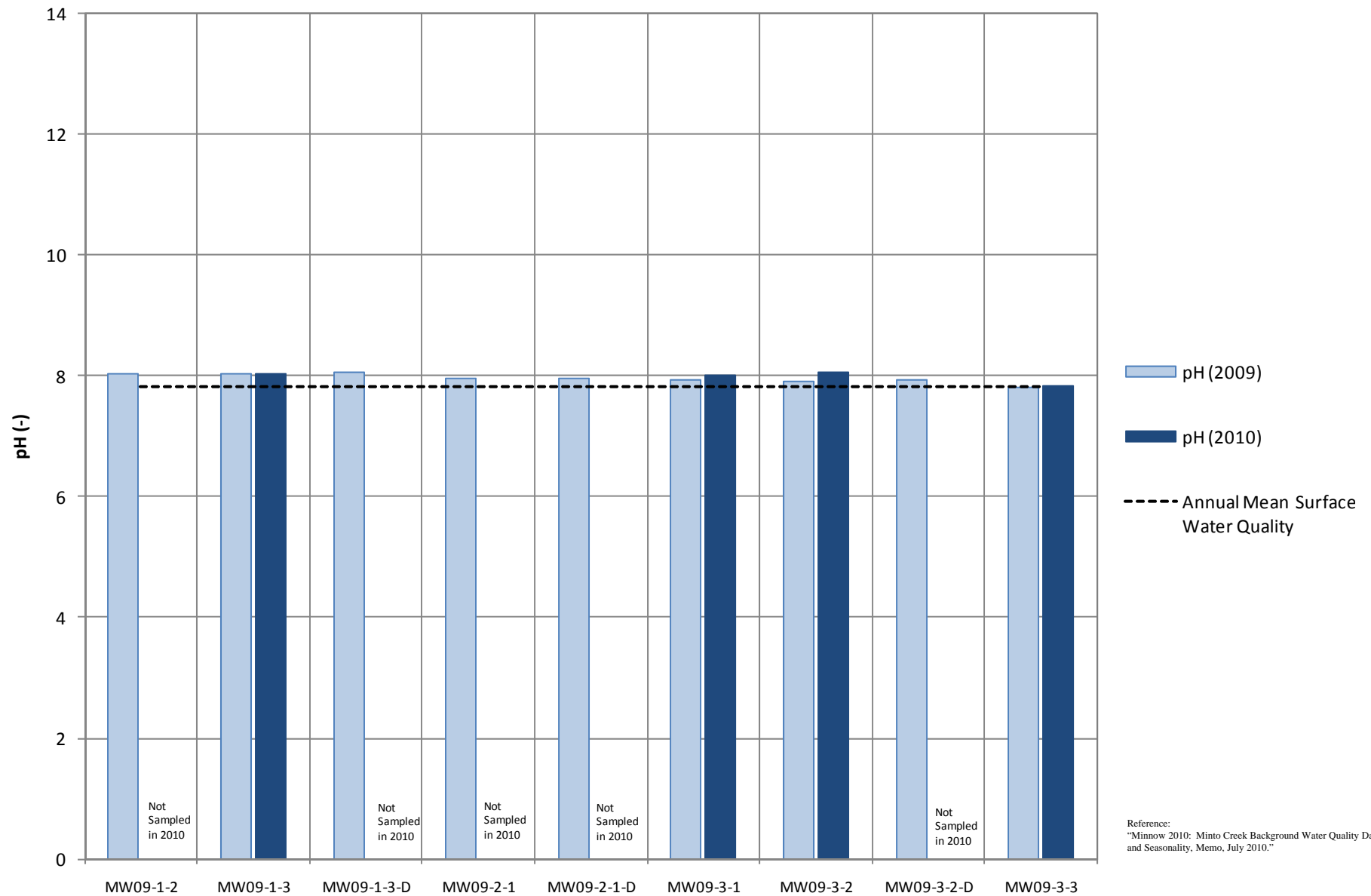
**2010 Groundwater Quality Data**

Parameter	Unit	Well-Zone							
		MW09-1		MW09-3					
		MW09-1-3	MW09-1-5	MW09-3-1	MW09-3-2	MW09-3-3	MW09-3-4	MW09-4-4	
<b>Date Sampled</b>		30-Mar-10	30-Mar-10	29-Mar-10	29-Mar-10	29-Mar-10	29-Mar-10	29-Mar-10	
<b>Sample Depth</b>	m	24.7	83.4	37.9	24.2	10.5	92.5	15.3	
<b>Physical Tests</b>									
pH @25°C	(1)	8.04	6.46	8	8.05	7.84	7.79	6.15	
Electrical Conductivity	µS/cm	941	2	315	502	158	161	1	
Hardness as CaCO3	mg/L	336	<5	144	178	69	71	<5	
T-Alkalinity as CaCO3	mg/L	184	<5	137	130	63	67	<5	
Turbidity	NTU	64	0.4	2.5	3	0.3	0.7	0.1	
Total Suspended Solids	mg/L	70	<3	<4	<7	<4	<4	<3	
Total Dissolved Solids	mg/L	630	32	196	324	114	112	12	
Colour	CU	<5	<5	<5	<5	<5	<5	<5	
<b>Major Anions and Cations</b>									
Carbonate	mg/L	<6	<6	<6	<6	<6	<6	<6	
Calcium	mg/L	93.7	<0.1	41.2	56.3	23.4	24.2	<0.1	
Magnesium	mg/L	24.7	<0.1	9.9	9.2	2.4	2.6	<0.1	
Sodium	mg/L	53.3	<0.1	5.7	24.9	2.6	2.7	<0.1	
Phosphorus	mg/L	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
Potassium	mg/L	7	0.7	4.4	6.6	2.3	2.2	0.6	
Silicon	mg/L	3.39	3.38	4	3.7	3.85	3.98	<0.05	
Bicarbonate	mg/L	220	<5	170	160	80	80	<5	
Hydroxide	mg/L	<5	<5	<5	<5	<5	<5	<5	
Ionic Balance	%	106		115	108	116	111		
<b>Anions and Nutrients</b>									
Ammonium - N	mg/L	6.16	<0.05	0.35	0.99	<0.05	<0.05	<0.05	
Total Kjeldahl Nitrogen	mg/L	8.89	<0.06	0.4	1.22	<0.06	<0.06	<0.06	
Total Phosphorus	mg/L	0.09	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Orthophosphate-P	mg/L	0.06	0.06	0.06	0.07	0.06	0.06	<0.01	
Nitrate and Nitrite - N	mg/L	21.6	0.02	0.26	16.1	0.47	0.48	<0.01	
Chloride	mg/L	18.5	0.24	0.4	3.82	0.61	0.61	<0.02	
Sulfate (SO4)	mg/L	169	<0.6	23	48.9	10	10	<0.6	
<b>Dissolved Metals</b>									
Aluminum	mg/L	0.048	<0.005	<0.005	<0.005	<0.005	0.013	<0.005	
Antimony	mg/L	0.0011	0.0007	0.0009	0.0018	0.0009	0.0012	0.0006	
Arsenic	mg/L	0.0007	<0.0002	0.0002	0.0012	<0.0002	<0.0002	<0.0002	
Barium	mg/L	0.142	<0.001	0.047	0.035	0.013	0.01	<0.001	
Beryllium	mg/L	<0.00004	<0.00004	<0.00004	<0.00004	<0.00004	<0.00004	<0.00004	
Bismuth	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Boron	mg/L	0.095	0.007	0.106	1.99	0.04	0.042	<0.004	
Cadmium	mg/L	0.00015	0.00002	0.00012	0.00072	0.00002	<0.00001	<0.00001	
Chromium	mg/L	<0.0004	<0.0004	0.001	0.0013	<0.0004	<0.0004	<0.0004	
Cobalt	mg/L	0.00045	0.00004	0.00014	0.0002	0.00009	0.00008	0.00002	
Copper	mg/L	0.021	0.001	0.004	0.006	0.005	0.004	<0.001	
Iron	mg/L	0.18	<0.01	0.04	<0.01	<0.01	0.03	<0.01	
Lead	mg/L	0.0003	0.0001	0.0011	0.0003	0.0007	0.0002	0.0002	
Lithium	mg/L	0.003	<0.001	0.003	0.004	<0.001	<0.001	<0.001	
Manganese	mg/L	0.168	0.0003	0.109	0.0616	0.0129	0.0087	<0.0002	
Mercury	ug/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
Molybdenum	mg/L	0.148	<0.0001	0.0052	0.045	0.0064	0.0049	<0.0001	
Nickel	mg/L	0.002	<0.001	0.005	0.002	<0.001	<0.001	<0.001	
Selenium	mg/L	0.0018	<0.0006	<0.0006	0.0028	<0.0006	<0.0006	<0.0006	
Silver	mg/L	<0.00001	<0.00001	<0.00001	0.00001	<0.00001	<0.00001	<0.00001	
Strontium	mg/L	1.41	<0.001	0.863	0.739	0.125	0.12	<0.001	
Sulfur	mg/L	56.2	<0.2	7.6	16.3	3.4	3.5	<0.2	
Tellurium	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Thallium	mg/L	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	
Thorium	mg/L	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	
Tin	mg/L	0.0003	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Titanium	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
Uranium	mg/L	<0.0004	<0.0004	0.0015	0.0014	<0.0004	<0.0004	<0.0004	
Vanadium	mg/L	0.0003	<0.0001	0.0001	0.0004	0.0002	0.0004	<0.0001	
Zinc	mg/L	0.016	0.004	0.014	0.005	0.005	0.004	0.004	
Zirconium	mg/L	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
<b>Total Metals</b>									
Aluminum	mg/L	1.31	<0.005	0.043	0.03	0.01	0.014	<0.005	
Antimony	mg/L	0.0005	<0.0002	0.0002	<0.0002	<0.0002	0.0003	<0.0002	
Arsenic	mg/L	0.0012	<0.0002	0.0004	0.0015	<0.0002	<0.0002	<0.0002	
Barium	mg/L	0.186	<0.001	0.05	0.036	0.013	0.01	<0.001	
Beryllium	mg/L	0.00005	<0.00004	<0.00004	<0.00004	<0.00004	<0.00004	<0.00004	
Bismuth	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Boron	mg/L	0.095	0.016	0.29	1.92	0.034	0.034	0.01	
Cadmium	mg/L	0.00014	<0.00001	0.00011	0.00004	0.00001	0.00006	<0.00001	
Calcium	mg/L	98.7	<0.05	42.5	59.3	24.9	24.9	<0.05	
Chromium	mg/L	0.0072	<0.0004	0.0022	0.0014	<0.0004	0.0006	<0.0004	
Cobalt	mg/L	0.00147	<0.00002	0.00019	0.00022	0.00007	0.00006	<0.00002	
Copper	mg/L	0.029	<0.001	0.006	0.008	0.004	0.004	<0.001	
Iron	mg/L	3.37	0.026	0.183	0.175	0.027	0.047	<0.01	
Lead	mg/L	0.001	0.0001	0.0003	0.0003	0.0002	0.0002	<0.0001	
Lithium	mg/L	0.003	<0.001	0.003	0.005	<0.001	<0.001	<0.001	
Magnesium	mg/L	26.8	<0.05	10.4	9.76	2.62	2.63	<0.05	
Manganese (SemiTrace)	mg/L	0.219	<0.005	0.118	0.06	0.007	<0.005	<0.005	
Manganese (Trace)	mg/L	0.225	0.0002	0.123	0.0677	0.0132	0.009	<0.0002	
Mercury	ug/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
Molybdenum	mg/L	0.146	<0.0001	0.006	0.0468	0.0065	0.0051	<0.0001	
Nickel	mg/L	0.006	<0.001	0.007	0.002	<0.001	0.001	<0.001	
Potassium	mg/L	7.2	0.1	4.2	6.8	2.1	1.9	<0.1	
Selenium	mg/L	0.0019	<0.0006	<0.0006	0.0029	<0.0006	<0.0006	<0.0006	
Silicon	mg/L	7	3.7	4.6	4.11	4.4	4.39	<0.05	
Silver	mg/L	0.00012	<0.00001	0.00006	0.00017	0.00004	0.00003	<0.00001	
Sodium	mg/L	56.9	0.13	7.37	25.7	3.08	3.07	0.3	
Strontium	mg/L	1.43	<0.001	0.886	0.785	0.126	0.127	0.001	
Sulfur	mg/L	58.3	<0.1	7.3	15.8	3.4	3.4	<0.1	
Tellurium	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Thallium	mg/L	0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	

**2010 Groundwater Quality Data**

Parameter	Unit	Well-Zone							
		MW09-1		MW09-2		MW09-3		MW09-4	
		MW09-1-3	MW09-1-5	MW09-3-1	MW09-3-2	MW09-3-3	MW09-3-4	MW09-4-4	
<b>Date Sampled</b>		30-Mar-10	30-Mar-10	29-Mar-10	29-Mar-10	29-Mar-10	29-Mar-10	29-Mar-10	
<b>Sample Depth</b>	m	24.7	83.4	37.9	24.2	10.5	92.5	15.3	
Thorium	mg/L	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	
Tin	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Titanium	mg/L	0.079	<0.001	0.002	<0.001	<0.001	<0.001	<0.001	
Uranium	mg/L	<0.0004	<0.0004	0.0015	0.0014	<0.0004	<0.0004	<0.0004	
Vanadium	mg/L	0.0049	<0.0001	0.0003	0.0005	0.0003	0.0004	<0.0001	
Zinc	mg/L	0.025	0.003	0.016	0.01	0.01	0.01	0.005	
Zirconium	mg/L	0.0005	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	





Reference:  
 "Minnow 2010: Minto Creek Background Water Quality Data and Seasonality, Memo, July 2010."



Job No: 2CM022.017  
 Filename: Fig5\_pH.gf.20100805.ppt



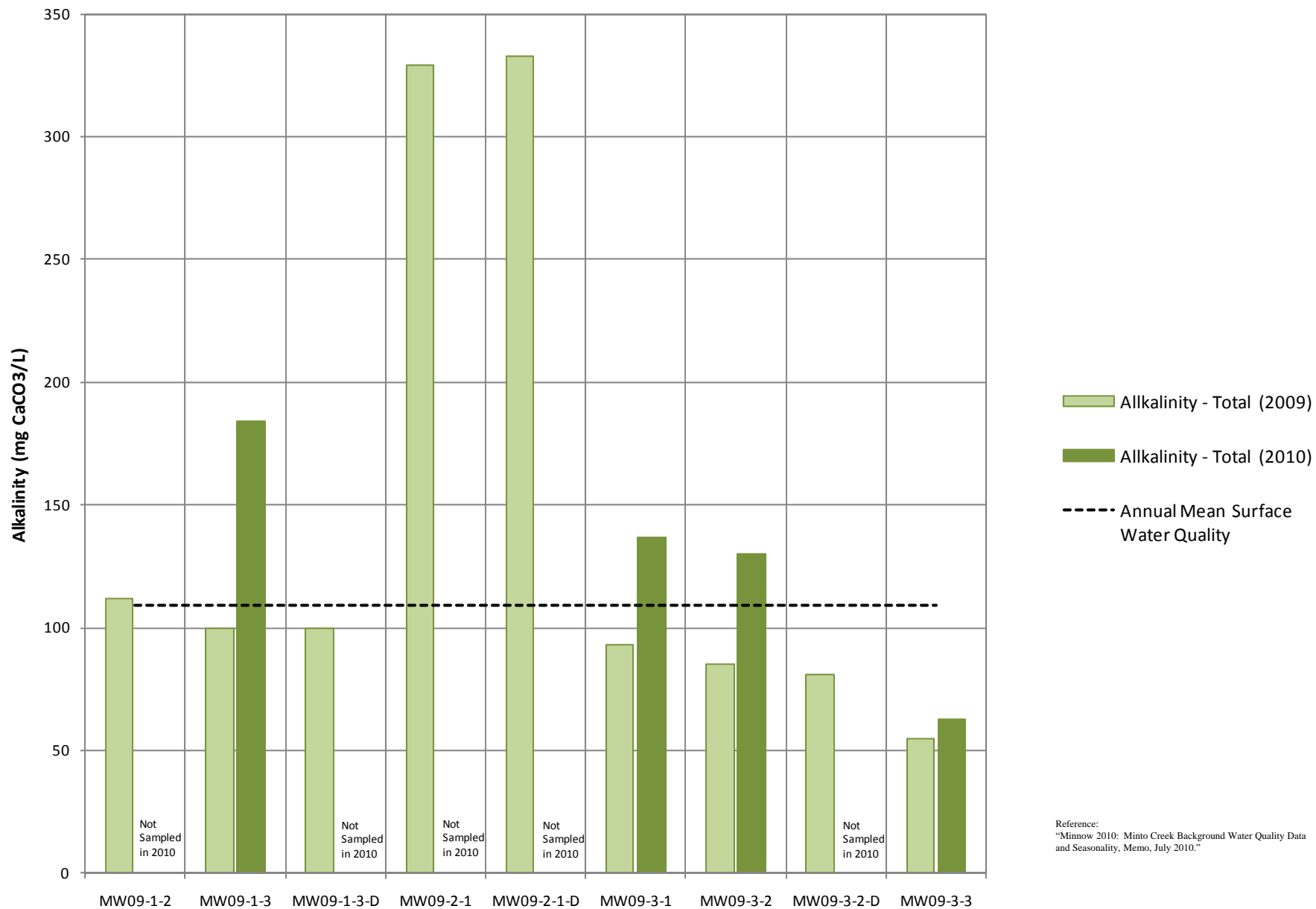
MINTO MINE

pH

Date: August 5, 2010

Approved: MR

Figure: 5



Reference:  
 "Minnow 2010: Minto Creek Background Water Quality Data and Seasonality, Memo, July 2010."

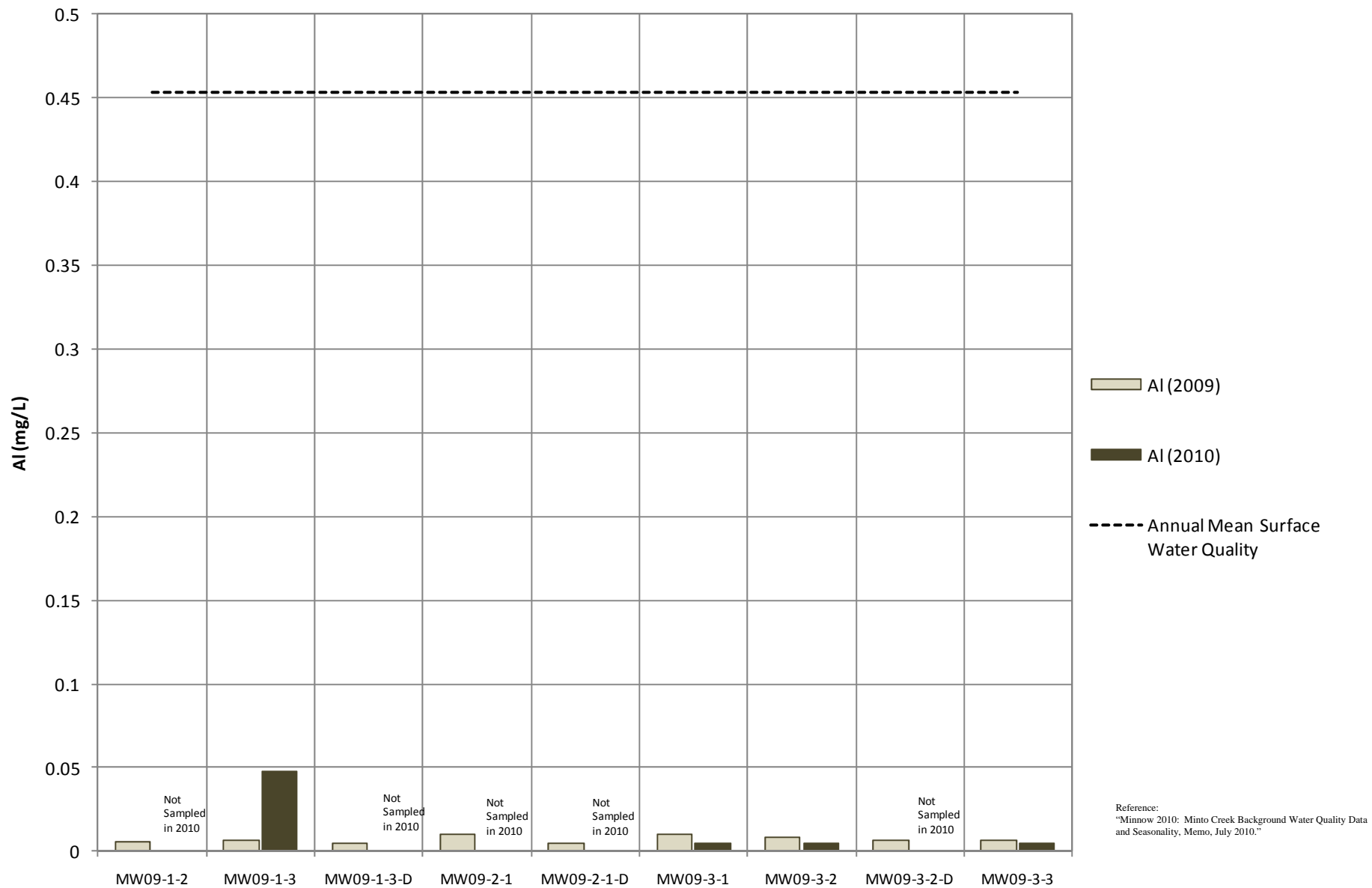


**Alkalinity**

Job No: 2CM022.017  
 Filename: Fig6\_Alkalinity.gf.20100805.ppt

MINTO MINE

Date: August 5, 2010	Approved: MR	Figure: <b>6</b>
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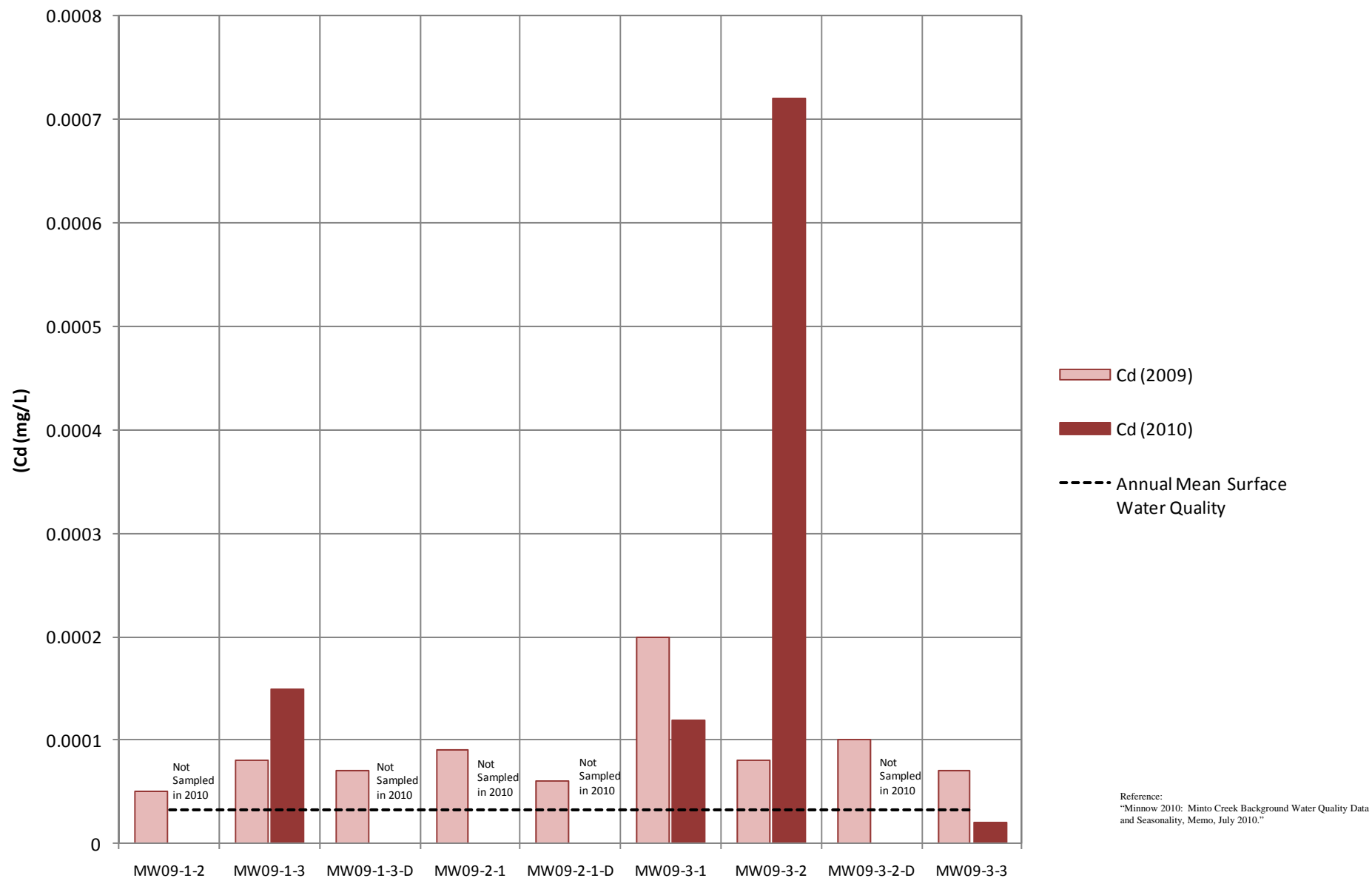
**Aluminium (Dissolved)**

Job No: 2CM022.017  
 Filename: Fig7\_Aluminium.gf.20100805.ppt

MINTO MINE

Date: August 5, 2010	Approved: MR	Figure: <b>7</b>
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**Cadmium (Dissolved)**

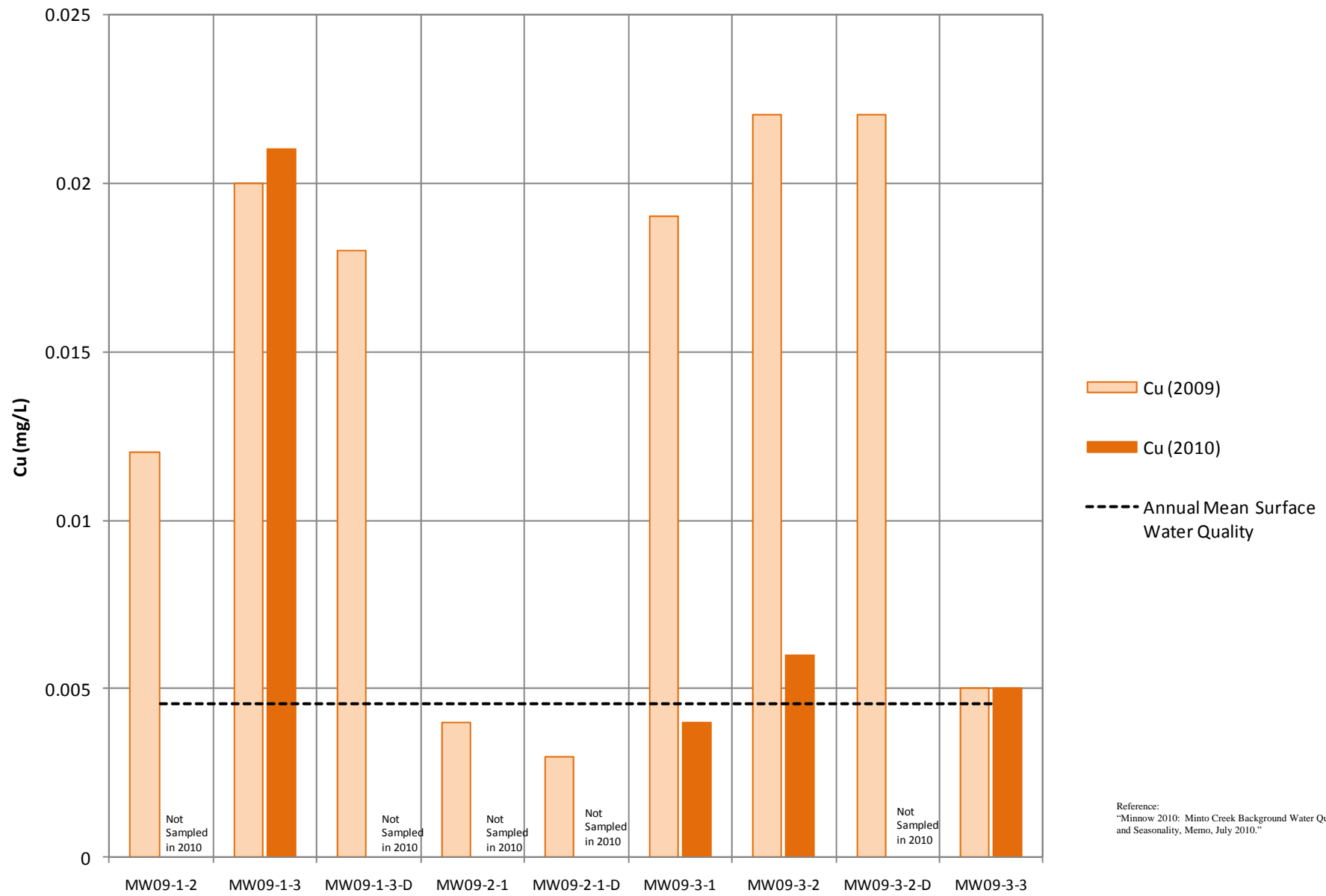
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Date: August 5, 2010

Approved: MR

Figure: **8**



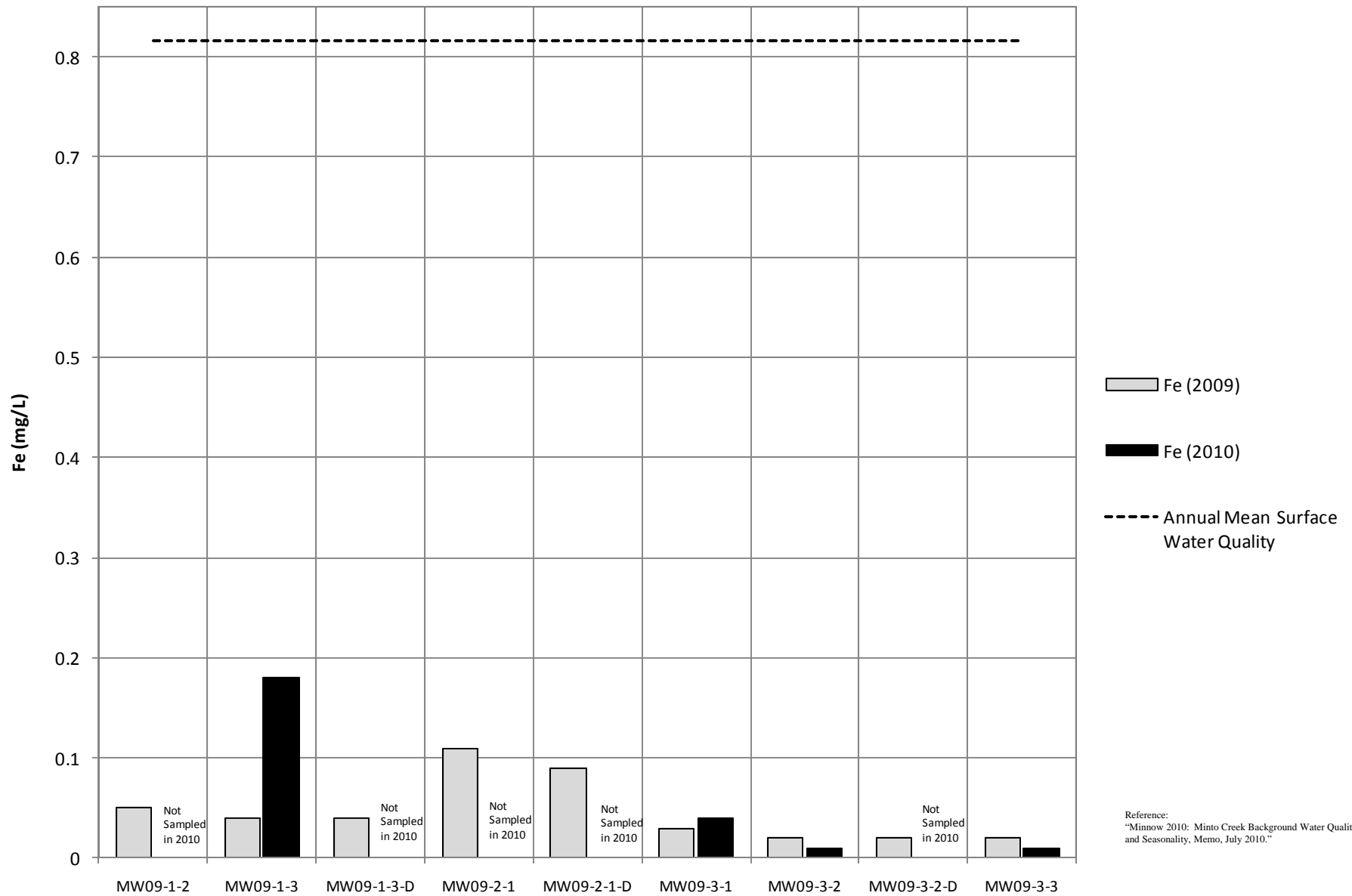
Job No: 2CM022.017  
 Filename: Fig9\_Copper.gf.20100805.ppt



MINTO MINE

**Copper (Dissolved)**

Date: August 5, 2010	Approved: MR	Figure: <b>9</b>
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**Iron (Dissolved)**

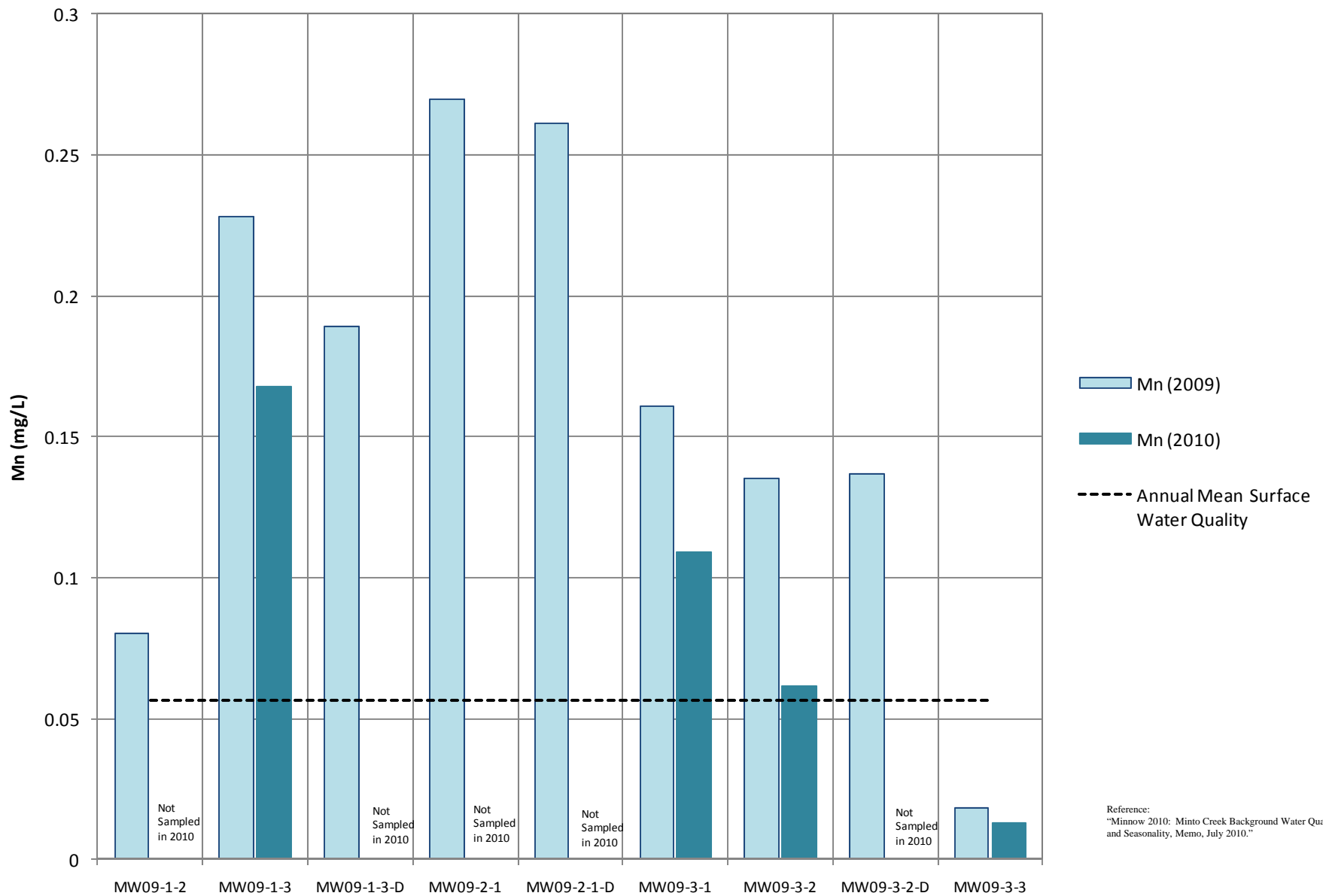
Job No: 2CM022.017  
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MINTO MINE

Date: August 5, 2010

Approved: MR

Figure: 10



**Manganese (Dissolved)**

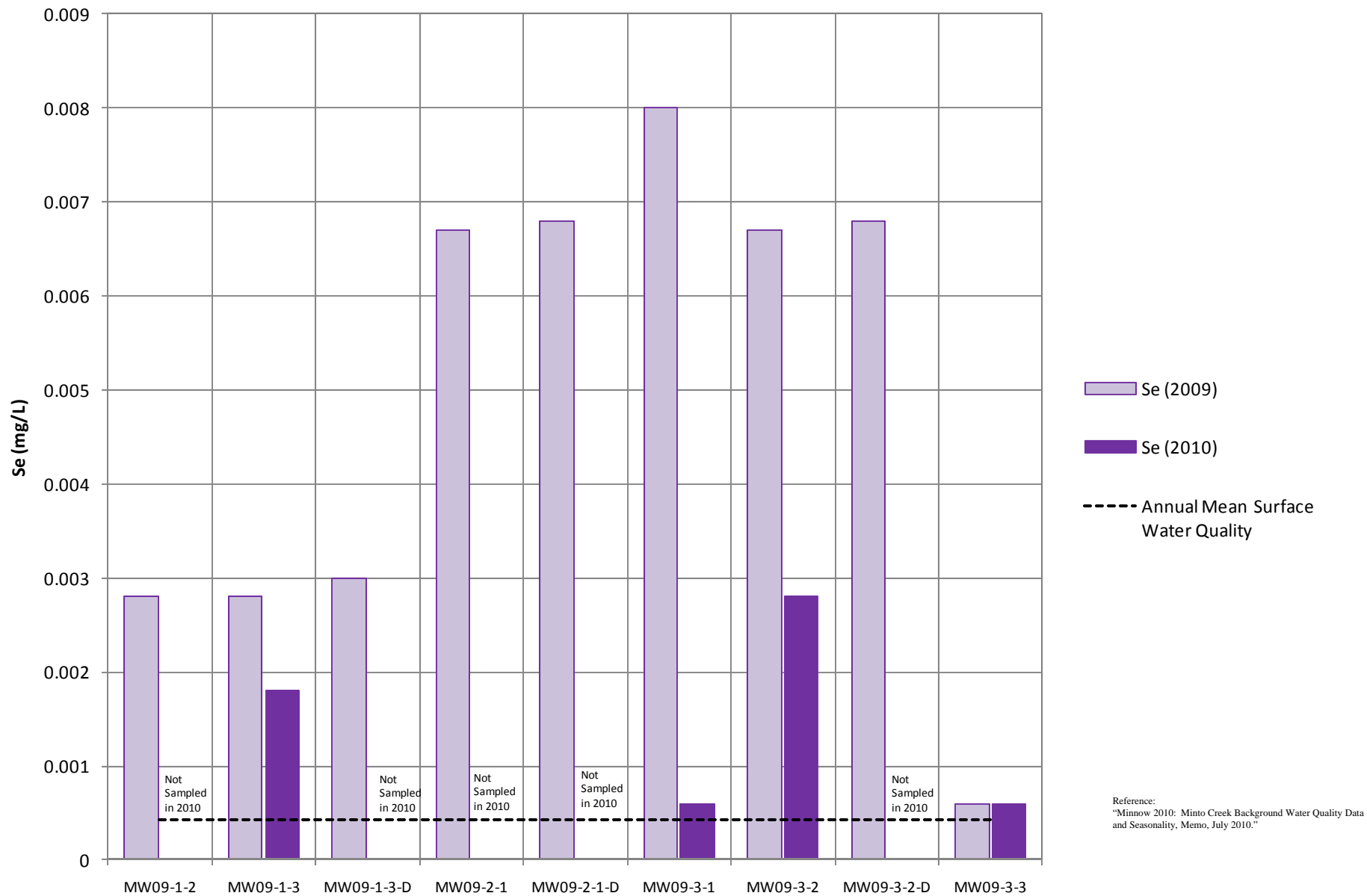
Job No: 2CM022.017  
 Filename: Fig11\_Manganese.gf.20100805.ppt

MINTO MINE

Date: August 5, 2010

Approved: MR

Figure: 11



**Selenium (Dissolved)**

Job No: 2CM022.017  
 Filename: Fig12\_Selenium.gf.20100805.ppt

MINTO MINE

Date: August 5, 2010

Approved: MR

Figure: 12



## 5.0 Conclusions and Recommendations

Permafrost and piezometric (water level) conditions observed to date on the site support the conceptual model that groundwater flow will be concentrated in the shallow, active surface materials during summer thaw period and in the deeper, sub-permafrost aquifer system.

Based on the piezometric data and topography observed, the deeper groundwater flow is expected to discharge within the mine site, prior to the W3 compliance point. Therefore; any impacted groundwater will enter the surface water system and contribute to surface water loading. However; the expected flux (volume over time) will be low, so even at baseflow conditions we do not expect significant impact.

Groundwater chemistry across the site appears to be fairly consistent. Based on this observation, it is expected that it will be possible to model groundwater chemistry interactions with reasonable confidence across the site. This will be confirmed through additional monitoring of the ground water wells, and from seeps that are not influenced by mine workings (i.e.: not from the toe of an established waste dump, etc).

Going forward, the groundwater monitoring system will be upgraded to take into account new mine infrastructure and tailings facilities as required. At this time, Minto Exploration has committed to re-establishing connection to the damaged MW09-04 and replacement of the destroyed MW09-02 once the design for the valley fill has been finalised.

For monitoring system operation, Minto will:

- conduct quarterly pressure profiles and sampling for all monitoring locations for a minimum of one year. At the end of this period, a review of all available hydrogeological data will be conducted and monitoring locations prioritized for sampling frequency (e.g., quarterly versus bi-annually or annually).
- maintain a clear record of the installation, development, monitoring, and servicing carried out on each groundwater monitoring installation over time, with a log of these events recorded and included in the annual monitoring report.

This letter report, “**Minto Mine: Groundwater Baseline Conditions**”, has been prepared by SRK Consulting (Canada) Inc.:

Yours truly,

**SRK Consulting (Canada) Inc.**



Michael Royle, M.App.Sci., P.Geo.  
Principal Hydrogeologist

**References:**

1. SRK 2008: Waste Dump Overburden Drilling. Minto Mine, Yukon
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# Minto Mine Groundwater Monitoring System Installation Report

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*Prepared for*

***Minto Explorations Ltd.***

*Prepared by*



*Project Reference Number*  
*SRK 2CM022.007*

***February 2010***

**Minto Mine**  
**Groundwater Monitoring System**  
**Installation Report**

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## Executive Summary

The groundwater monitoring system at the Minto Mine was augmented in 2009 with three multilevel monitoring systems. The main objectives of the Multiport (MP) monitoring wells are to:

- improve the understanding of hydrogeological conditions across the mine site, specifically as it behaves below the permafrost layer; and
- collect background data on piezometric levels and geochemistry of the hydrogeological system with respect to potential impact areas (waste rock piles, TMF, DSTF, etc).

This information will be used to establish baseline groundwater conditions at the site that can be directly monitored to detect possible impacts from mine infrastructure planned for the site.

This report summarizes the work carried out by SRK Consulting (Canada) Inc. during November and December, 2009 designed to drill and log four new holes, and install multi-level monitoring wells in each hole.

The new wells were designed to collect data to assess or enhance the understanding of:

- piezometric pressure distributions in depth discrete intervals in all monitoring wells;
- current pattern of groundwater flow across the site; and
- groundwater geochemistry for discrete depths in all wells.

The original plan called for the installation of four monitoring wells (MW09-01 to -04), located at current and future points of potential groundwater impact. The four new drillholes were all completed successfully to target depths; however, one of the installations (MW09-04) was damaged due to collapse of uncased waste rock near the surface soon after installation of the monitoring well had been completed.

MW09-04 may still be recoverable; however, frozen ground conditions do not allow for safe or easy access and so recovery efforts have been put on hold until the summer of 2010. It should be noted that MW09-04 is located up gradient of the currently dewatered Main Zone pit and so would not see any impacts from tailings or waste rock disposal until such time that mining in the pit ceases and it is converted to a tailings management facility (TMF) sometime in 2012. Therefore, a delay in data collection at this point is not considered to be significant with respect to site monitoring requirements.

Monitoring well and protective casing design and packer locations are illustrated for each drillhole to show the hydrogeological features that the data relate to. Installation details for MW09-04 are included for completeness, and to illustrate how this area will be covered by the recovered or replacement well.

Preliminary data were collected from each MP system and presented in this report. At this time, all available pressure and hydrogeochemistry data and the resulting interpretations are considered to be preliminary, as it is uncertain whether the monitoring zones have equilibrated from the drilling and installation disturbances. Future monitoring data will be used to determine when pressures and water chemistry have reached equilibrium with the surrounding rock.

The piezometric data collected from the new and existing multilevel monitoring wells will be used to better define the patterns of groundwater flow in the rock mass surrounding the currently dewatered Main Zone pit and throughout the site, as well as improve the conceptual model with respect to characteristics of hydrogeological features such as faults and regions on the site with little previous groundwater data. Geochemistry samples will be used to delineate flow paths and sources of water as it flows through the site and moves towards receptor bodies.

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# 1 Introduction

This report describes the design and installation of multilevel monitoring wells at the Minto Mine, Yukon. The purpose of the monitoring system is to improve the understanding of hydrogeological conditions across the site and provide background water levels and hydrogeochemistry for environmental monitoring of the site. Four new drill holes were instrumented with the multilevel MP system. Figure 1 shows the general layout of the mine workings, major faults and all monitoring locations on the site. Information from the new monitoring system will be helpful in establishing the probable flow system in a flooded mine scenario and the hydrogeological controls for water entering and exiting the mine workings.

This report provides initial results of post installation pressure monitoring and makes limited recommendations for future monitoring of the MP well network.

## 1.1 Regulatory Requirements

The Minto Mine is subject to Type “A” Water Use License QZ96-006 (WUL) issued by the Yukon Water Board. Section 7.0 of the WUL require that a groundwater monitoring plan be prepared for the site, and stipulates that the monitoring plan shall:

### Groundwater Monitoring Plan

71. *On or before the first anniversary of the start up date, the Licensee shall submit to the Board a Groundwater Monitoring Plan.*
72. *The Groundwater Monitoring Plan shall be designed in order to monitor potential groundwater contamination related to the waste rock/overburden dumps.*
73. *The Groundwater Monitoring Plan shall include at least two groundwater monitoring wells below the toe of each of the waste rock and overburden dumps. The siting and depth of these wells shall be based on the hydro geology of the area below the dumps and shall be selected to provide an early indication of the impact of the dumps on local groundwater quality.*

Monitoring of groundwater conditions is also a component to the monitoring program for the Dry Stack Tailings Facility (DSTF) at the site, as prescribed in the document Minto Mine Tailings Management Plan (January 2007), which was submitted as a requirement of the project’s Quartz Mining License QML-0001 and approved by Yukon Government, Energy Mines and Resources (YG EMR). The requirements for groundwater monitoring in the DSTF are an element of the site groundwater monitoring regime, but will only be identified and referenced in this plan, as they may change with amendments to the Tailings Management Plan.

## 1.2 Monitoring Objectives

As stipulated in the WUL, a groundwater monitoring program will be carried out in the vicinity of the waste rock, overburden dumps, and the dry stack tailings facility (DSTF) at the Minto Mine site to provide background and on-going water quality data. The objective of the groundwater monitoring program is to provide an early indication of potential impact of the dumps on the local groundwater quality. In addition, this plan contains adaptive management and contingency measures if contamination is detected.

## 2 Hydrogeological Conditions

Groundwater at the Minto site will be constrained to the overburden and bedrock flow systems. A complicating factor for monitoring groundwater at the site is the extent of permafrost at the site. The general hydrogeological characteristics are discussed below to give a clearer picture of the conditions that will affect the movement of groundwater on the site.

### 2.1 Permafrost Conditions

Permafrost conditions on the site will make groundwater monitoring problematic. Permafrost on the site has been found to be extensive and deep (SRK, 2008). Data from drilling at several locations has shown permafrost ranging from depths from within 1.0m of ground surface to depths of up to 10 m.

Geotechnical drilling in 1994 and 1996 by EBA observed permafrost in each of the boreholes drilled within the vicinity of the proposed DSTF (See Figure 1), with the base of the permafrost occurring at varying depths (EBA, 2007). Measurements of the active layer in these areas indicated a maximum depth of only about 1.0 m in September 1996, directly under the DSTF footprint.

The observed ice contents in boreholes downstream of the DSTF (94-11 and 94-21) and within the footprint of the DSTF (96-G07 through -G12, excluding -G10), typically ranged from frozen ground to visible ice at 10% to 20% of the total volume. Two of the boreholes, 96-G09 and 96-G12, showed ice intervals of 1.5 and 4.0m thick respectively within the upper 10m.

Initial data from the ground temperature cables installed in 94-11, 94-21, and 96-G08 indicate a relatively uniform ground temperature of close to  $-0.8^{\circ}\text{C}$  after equilibration with slight seasonal warming within the top 2 to 4 m. The active layer in 94-G11 and 94-G21 are on existing disturbed trails, and so will be deeper than the surrounding soils. Readings from 2006 for 94-G11 indicate similar ground temperatures and active layer thickness.

In November 2007, vibrating wire piezometers were installed within and down gradient of the existing dry stack tailings facility (DSTF) in boreholes DSP-1 and DSP-2. Each of these piezometers is equipped with temperature sensors at the piezometer tip. At both of the locations, the



sensors were installed at 1 m and 1.7 m respectively. No pore water has been measured in the piezometers to date, as ground conditions have remained frozen.

In addition, three more temperature cables providing profile data were installed in the vicinity of the DSTF in holes DST-1, DST-2, and DST-5. Initial observations from the piezometer temperature probes indicate that temperatures did not rise above  $-0.3^{\circ}\text{C}$  at any time and ranged as low as  $-2.6^{\circ}\text{C}$ . Temperature cable DST-5 (Figure 1) is located outside of the footprint of the DSTF and provided a profile reflecting conditions on an un-insulated site. Temperature averaged approximately  $-0.5^{\circ}\text{C}$  below 1 m depth, and fluctuated near surface to values exceeding  $5^{\circ}\text{C}$ .

No groundwater was observed in any of the boreholes during the EBA geotechnical drilling program.

Soil investigation drilling in the region of the SW waste rock dump in February to April, 2008 (SRK, 2008), most cores contained non-visible ice, indicating the pore water was frozen; however, clear chunks of ice were also observed in many cases. Data from thermistors installed in the same drill holes indicate that this permafrost is close to  $0^{\circ}\text{C}$ ; however, water in any monitoring standpipes would freeze in the permafrost layer.

The results of the temperature and piezometer monitoring near the SW Dump through June 2008 suggest that unfrozen layers at depth may be limited or non-existent, and that shallow perched water tables within the seasonally thawed active layer may provide the only mechanism for transport within this region of the basin.

## 2.2 Overburden

Geotechnical investigations within the plan area of the DSTF (EBA, 2007) indicated overburden thicknesses of up to 45m. These deposits are thought to be an extension of an infilled valley, which also passes through the southern end of the open pit. The overburden soils generally comprise a thin veneer of peat and vegetation overlying a fine-grained silt or silt and sand of colluvium origin. The colluvium is underlain by coarse-grained sand with trace gravel that is considered to be a residual soil. The exception to this is at borehole 94-21, in which a clay layer from ground surface to a depth of 18-9m was observed (EBA, 2007).

Throughout the mine site the residual soils grade into weathered bedrock. The overburden soils thin out to the south and east of the DSTSF site.

Detailed soil logging by SRK in the area of the SW Dump (SRK, 2008) indicated that overburden material is comprised of silty, and in certain locations, clayey material, with fractions of sand, gravel and cobbles. Overburden thickness varies in this area (from 10.7m at 08SWC270 to 51.8m at 08SWC273). Typically, the overburden thickness increased along the valley bed, and decreased on the valley slopes. This is expected to be similar for overburden conditions across the project site.

## 2.3 Bedrock

### 2.3.1 Lithology

Bedrock in the vicinity of the DSTF is located at approximately 45m depth (EBA, 2007). In general, outcrop exposure on the property is poor. Where exposure is available, it has been affected by deep weathering and variable oxidation, as the terrain was not glaciated during the last ice age event.

The Minto site is underlain by predominantly igneous rocks of granodiorite composition. Minor amounts of other lithologies consisting of small dykes of simple quartz-feldspar pegmatite, aplite, and an aphanitic textured intermediate composition rock are also observed. Bodies of all of these units are relatively thin and rarely exceed one metre core intersections. These dykes are relatively late, generally postdating the peak ductile deformation event; however, some pegmatite and aplite bodies observed in a rock cut located north of the mill complex are openly folded. Conglomerate and volcanic flows have been logged in drill core by past operators, but have not been recently confirmed as the drill core from previous campaigns was largely destroyed in forest fires and no new drilling has intersected such rocks.

With the possible exception of the lithological contacts of the dykes, the lithology types encountered in the Minto Mine site are not expected to have significant primary porosity as it relates to hydraulic conductivity (K) or transmissivity. The low K values (less than  $10^{-9}$  m/s) make it unlikely that significant groundwater flow will occur in competent bedrock. Flow may, however, occur in bedrock that has been fractured/faulted to produce open, secondary porosity/permeability.

### 2.3.2 Structure

Secondary porosity/permeability is the dominant flow path in intrusive and metamorphic rocks. For this reason, it is important to have an understanding of the structural and mineralization environment of the site when constructing the conceptual flow model.

The copper-sulphide mineralization at Minto is strongly associated with foliated granodiorite within a deformation zone. The deformation zone forms sub-horizontal horizons within the more massive plutonic rocks of the region and can be traced laterally for more than 1,000 metres in the drill core. The similarity of chemistry and texture of both the deformed and the massive granodiorites suggest the deformation zones are structural in origin and not stratigraphic. The deformation zones are thought to represent healed, shallowly dipping faults that may have formed when the rocks passed through the brittle/ductile transformation zone in the earth's crust in transition from a deep emplacement environment to eventual exhumation of the regional batholith. Because of the inclusion of mineralization and the ductile nature of the main faulting at the site, these healed structures are not expected to represent significant flow paths.

Late, brittle fracturing and faulting is noted throughout the property area and is associated with a conjugate set of regional faults. The DEF Fault strikes more or less east-west and dips north-northwest and cuts off the main zone mineralization at its northern end. This type of faulting

can often form significant flow paths within a rock mass. However; recent drilling results and data collected from instrumentation across the DEF fault in the north wall of the main Pit indicates that a significant hydraulic head is maintained across this feature (SRK, 2009 – unreported work in progress). This appears to indicate that the DEF is not a significant flow feature, but rather is holding back water flow across the structure. This characteristic; whereby, fault zones act as barriers to flow has been observed at other mine sites.

Current structural analysis of the site (SRK, 2009 - work in progress) indicates that faults of any sort are not expected to occur within the footprints of the waste and overburden dumps or DSTF.

### 2.3.3 Historical and Existing Groundwater Monitoring

To date, groundwater monitoring has been installed under various initiatives, including:

- Installation of standpipes in 1994 at the proposed dam alignment (P94-20) and the pit vicinity (P93-E):
  - Water chemistry samples collected between 1994 and 2006.
  - Water levels observed at ~15m and 26m depth in P94-20 and P93-E respectively.
  - Both destroyed during construction and pit excavation, respectively, in 2006).
- Vibrating wire transducers down gradient of the DSTF;
- Vibrating wire transducers in the dam core; and
- Standpipes installed during the SW dump foundation investigation.

Besides standpipes P93-E and P94-20, it appears that all standpipes installed on the site to date have frozen, indicating that permafrost conditions exist across most of the site at shallow depths.

### 2.3.4 Hydrogeological Implications of the Geological Model and Past Monitoring

The implications of the geology (thermal conditions, overburden, and lithology) found at the Minto site and the past monitoring events are:

- Permafrost:
  - will dominate groundwater flow system below active zone to depths of up to 45m; and
  - SRK expects that conventional “standpipe” monitoring wells installed through the permafrost in to the underlying unfrozen ground will be inoperable as the piezometric levels will be near surface; therefore, the resulting water in them will freeze.
- Shallow flow:
  - will be dominated by permafrost conditions;
  - will occur in the seasonally thawed layer; and
  - will be controlled by overburden composition in the unfrozen areas.
- Deeper flow:
  - will occur below the permafrost within the overburden or bedrock;

- will concentrate in the shallow, weathered zone if unfrozen; and
- standpipe monitoring wells will not be an effective means of monitoring the deep groundwater system.

Based on this, we expect that groundwater flow related to the waste rock and overburden dumps and the DSTF will only have significant impact on the shallow, active layer system. The deeper, bedrock hosted flow system is expected to be isolated from these facilities due to the permafrost layer.

We also expect that standpipe monitoring wells will not be an effective means of monitoring groundwater below the permafrost at the Minto site, and would be effective only seasonally when installed in the active layer.

### 3 Groundwater Monitoring System

#### 3.1 Locations

For the 2009 installation program, Westbay MP (multi-port) monitoring wells were installed in four new drillholes (MW09-01, MW09-02, MW09-03, and MW09-04).

MP systems were installed in order to gain as much depth discrete information as possible from each drillhole, and to allow for operation through the permafrost. This latter aspect is possible due to the MP System being a closed pipe system such that fluids inside the pipe are isolated from the surrounding formation fluid or natural groundwater. The formation water is accessed by a wireline tool that opens individual valves to measure pressure and collect groundwater samples. The water inside the MP Casing within the permafrost is kept from freezing by mixing polypropylene glycol (antifreeze).

Table 1 lists locations and purpose for each of the new monitoring systems. The locations for each monitoring system are illustrated on Figure 1.

**Table 1: Monitoring Well Locations and Design Objective**

Well ID	Drillhole Type and Diameter	Location	Surveyed Coordinates (UTM NAD83)	Purpose
MW09-01	New; HQ	West Pit Access	384177 E 6944984 N 858 masl	Establish baseline groundwater conditions down gradient of the Main Dump, and the proposed NW, NE, and SW Dumps
MW09-02	New; HQ	Lower Tailings	385676 E 6945034 N 757 masl	Establish groundwater conditions down gradient of the dry stack tailings facility (DSTF)
MW09-03	New; HQ	Minto North	384253 E 6946159 N 908 masl	Establish baseline groundwater conditions down gradient of the proposed North Pit
MW09-04	New; HQ	Phase 1 Confluence	384954 E 6944926 N 794 masl	Establish baseline groundwater conditions down gradient of the Main Zone Pit tailings management facility

Monitoring wells were located to intercept expected flow paths from the adjacent mine waste facilities in order to act as a groundwater monitoring system. The flow paths were based on the current understanding of the site geology and conceptual hydrogeological model.

## 3.2 Drilling Techniques and Core Logging

MW09-01 to -04 were drilled as HQ3 diameter (96mm) boreholes using a hydraulic diamond coring drill rig operated by Driftwood Drilling of Smithers, BC. Polymer based drilling additives were only used when drilling through highly fractured surface rock. Drillholes were flushed significantly after use of polymer drilling fluids.

Core was collected over the entire drilled interval, boxed, and logged. Core logging included identification of lithology, structures, and hydrogeological features, such as zones or structures showing iron staining or concretion, interpreted to be a result of subsurface water flow. Rock Quality Designation (RQD), core recovery, and qualitative hammer tests to determine rock strength data were also recorded. Complete drillhole logs are included in Appendix A. Depths in the drill logs represent drillhole depth, and all holes were vertical. All holes were logged using imperial units, but have been converted to metric for use in this report.

Specific attention was paid to identification of ice, or frozen soil/rock, in the core. However, slow drilling conditions usually meant that recovered core had been heated to above 0°C so it was difficult to determine if material was frozen *in situ*. Therefore, delineation of the permafrost base is ambiguous at this point. Future monitoring should be able to define this boundary with reasonable accuracy based on casing fluid temperature profiles, and will be part of the regular monitoring data collection process.

All drill core was digitally photographed before the boxes were sealed. These photos are included on the accompanying disk, but have not been reproduced in this report.

The boxed core will be stored as with all other core on site.

## 3.3 MP Casing Installation Program

### 3.3.1 Installation Procedures

Installation of the Westbay MP casing consists of the following:

1. Design of modular component layout for each well (see component logs in Appendix B) based on drill core observations;
2. Lowering and field testing of components to design depth;
3. Individual inflation of hydraulic packers to hydraulically isolate the sampling zones;

4. Hydraulic integrity testing of MP casing (see if it can maintain a differential water level between it and the open drillhole) to check for leaks; and
5. Initial pressure profile to test for ability to maintain differential pressures across packers.

As the MP casing is watertight, it is buoyant in the drillhole and has to be sunk into position by adding clean water. During installation, propylene glycol was also added to protect the water in the casing from freezing in the permafrost zone. The antifreeze will not enter the sampling zone (groundwater) as the MP Casing is sealed until opened by the sampling tool, at which point fluid enters the casing and does not escape, as the piezometric pressure inside the casing is maintained below the outside pressure. This method of preventing casing fluid entering the sampling zone has been reviewed by the USEPA for use at Superfund sites and found to be technically and operationally acceptable.

### 3.3.2 Details of Installed System

Monitoring zones and related packer locations were identified based on geological logs. The number of monitoring zones for each drillhole was based on a combination of observed features of hydrogeological interest and logical spacing for reasonable sample collection ability in low K rock.

Monitoring zones are numbered from the bottom up. Therefore, zone 1 is at the bottom of the well, and higher numbered zones are shallower. Table 2 summarises monitoring system information at each new location.

**Table 2: Monitoring Zone Details**

ID	Number of Monitoring Zones	Drillhole Length (m)	Monitoring System Length (m)	Zone Comments
MW09-01	3	50	50	<ul style="list-style-type: none"> <li>• Zone 1 did not produce a water sample</li> <li>• Zone 3 extends to the surface as there is no packer above the measurement port</li> </ul>
MW09-02	2	60	60	<ul style="list-style-type: none"> <li>• Zone 2 did not produce a water sample (possibly frozen)</li> </ul>
MW09-03	3	50	50	
MW09-04	3	75	75	<ul style="list-style-type: none"> <li>• Well damaged post installation</li> <li>• To be re-established in summer 2010</li> </ul>

\*NOTE: all depths and lengths rounded to nearest metre

### 3.3.3 Documentation

Well designs and installation QA documentation are provided in Appendix B. Casing depths listed on well design sheets refer to true depth as all drill holes were vertical.



### 3.3.4 MW09-4

Installation of MW09-4 was completed on November 24<sup>th</sup> 2009. When SRK and Minto staff returned to develop and sample the well on December 3<sup>rd</sup>, the MP casing was no longer vertical, and the wireline tools could not be lowered past an apparent bend in the casing just below the ground surface. Further investigation suggested that the uncased waste rock near the surface had shifted soon after installation of the monitoring well, causing the MP casing to deviate from its original alignment. Attempts were made to expose and straighten the upper part of the well, but the frozen ground conditions did not allow for safe or easy excavation. The well may still be intact and useable, but recovery efforts have been put on hold until the summer of 2010.

## 4 Monitoring

### 4.1 Pressure Monitoring

Preliminary pressure profiles for each of the monitoring wells are illustrated in Figures 2 through 4. Although no pressure data available at this time, Figure 5 illustrates the geology and well design for MW09-4 for comparison.

Piezometric data is only available for 2 monitoring events; immediately after installation and during the first sampling event several days later. Piezometric levels in each monitoring zone are plotted as the “equivalent depth to water” on the plots. This refers to the depth the water would be observed in an open standpipe if screened across the MP zone. The equivalent depth to water is calculated by adding the pressure head (height of water column calculated from the zone pressure measured) to the depth of the measurement port where the pressure was measured.

Plots also show an “atmospheric line”. This line indicates where the pressure head equals zero (i.e., piezometric head equals elevation head). This condition will occur if the zone is unsaturated (dry), and is analogous to an open borehole where the water level is at, or below, the measurement zone. Therefore, unsaturated zones will plot along the atmospheric line while saturated zones will plot above this line.

Tabulated pressure data are included in Appendix C.

### 4.2 Summary of Initial Pressure Data

Due to the low hydraulic conductivity of the rock observed to date at Minto Mine, it is not known whether piezometric pressures had equilibrated by the time the initial pressures were measured. Assuming that they are reasonably close to actual zone pressures, the following preliminary observations are presented:

- Data from MW09-01 indicate that that piezometric pressures in the three zones were slow to equilibrate (ie: significant change over two days) and that pressures are near atmospheric in the

zones. This may be due to the proximity of the monitoring system to the dewatered Main Zone pit, and indicate that the slope is mainly dewatered.

- Data from MW09-02 indicate that the two zones have the same piezometric pressure (hydrostatic), indicating either a well connected fracture system in the weathered bedrock, or possibly a suspect seal between packers. The latter will be tested during the next sampling round by monitoring an induced pressure between the zones to verify hydraulic performance.
- Data from MW09-03 indicate that generally hydrostatic conditions between the zones, with a slight upwards gradient as would be expected on a slope.
- No data available from MW09-04.

### 4.3 Development and Sampling

Monitoring wells were developed by opening the pumping ports using a wireline tool and then purging using a Waterra Hydrolift until the water was clear and pH, conductivity and temperature values were stable. The pumping ports were then closed and some of the water in the interior of the MP casing was pumped out in order to maintain a lower head relative to the water outside the casing. Development records are included in Appendix D.

Sampling from the MP wells was completed by attaching sample collection bottles to the wireline pressure measurement tool, and pumping out the air to create a near vacuum inside the bottles. When the tool is connected to a measurement port and the valve to the sample bottles is opened, water flows from outside the casing into the bottles due to the pressure difference. Two sample bottles were used, collecting approximately 500mL with each run. The sample bottles were thoroughly rinsed with distilled water between sampling zones, and with nitric acid at the start of each day.

Water samples were taken from all monitoring zones in wells MW09-01, MW09-2 and MW09-3, with the following exceptions:

- Zone 1 in MW09-1 showed a pressure reading lower than atmospheric pressure and did not appear to have any water flow; and
- Zone 2 in MW09-2 showed a pressure reading consistent with water in the formation, but no water flowed into the sample bottles on two separate attempts.

A duplicate sample was taken in each of the wells and labelled as if it were an additional zone, as noted on the sampling records, which are included in Appendix D.

Minto staff assisted with well development and sampling in order to become familiar with the MP system, and were trained to use the wireline sampling tools.

## 4.4 Initial Sampling Results

Initial water chemistry results are provided in Table 3 and Figures 6 to 8. Figures 6 and 7 illustrate the pH and alkalinity values from each of the zones sampled. Figure 8 gives the results for dissolved copper, molybdenum, and selenium. All sample results were above minimum detection limits. Results for filtered, dissolved metals have been presented as unfiltered samples are deemed to be unrepresentatively impacted by drill hole cuttings, etc.; therefore, not a good representation of true groundwater.

Table 3 presents detailed chemistry data. It should be noted that these data may be impacted by drilling fluids and should only be viewed as preliminary, and will be compared to future sampling results to determine when data are representative of formation hydrogeochemistry.

Parameter	Units	Well-Zone								
		MW09-1			MW09-2		MW09-3			
		MW09-1-2	MW09-1-3	MW09-1-3-D	MW09-2-1	MW09-2-1-D	MW09-3-1	MW09-3-2	MW09-3-2-D	MW09-3-3
Date	30-Nov-09	30-Nov-09	30-Nov-09	2-Dec-09	2-Dec-09	1-Dec-09	1-Dec-09	1-Dec-09	1-Dec-09	
<b>Physical Properties</b>										
pH	pH units	8.03	8.02	8.06	7.95	7.95	7.94	7.91	7.92	7.8
Conductivity	uS/cm	729	725	728	1090	1090	976	932	947	158
TDS	mg/L	528	364	442	814	812	652	626	672	110
TSS	mg/L	7	92	66	30	31	399	146	96	21
<b>Misc. Parameters</b>										
Alkalinity - Bicarbonate	mgCaCO3/L	140	100	100	400	410	100	100	100	70
Alkalinity - Carbonate	mgCaCO3/L	<6	<6	<6	<6	<6	<6	<6	<6	<6
Alkalinity - Hydroxide	mgCaCO3/L	<5	<5	<5	<5	<5	<5	<5	<5	<5
Alkalinity - Total	mgCaCO3/L	112	100	100	329	333	93	85	81	55
Hardness	mgCaCO3/L	318	262	274	503	508	253	242	255	60
Turbidity	NTU	1.1	32	26	13	16	95	49	47	6.9
Chloride	mg/L	7.22	7.28	7.27	5.52	5.73	17.9	16	16.3	0.93
Nitrogen as NH4	mg/L	0.72	3.85	3.03	1.29	1.26	5.79	5.32	5.6	0.26
Nitrogen as NO23	mg/L	42.9	42.1	42.1	23.2	24.4	60.9	58.2	59.7	1.87
Total Kjeldahl Nitrogen	mg/L	6.79	6	6.21	1.13	1.01	11.7	12.2	11.6	0.34
Phosphate (total)	mg/L	0.04	0.03	0.03	0.06	0.06	0.03	0.03	0.03	0.04
Sulphate (dissolved)	mg/L	77.4	82.5	83.3	166	170	117	110	115	10
<b>Dissolved Metals</b>										
Ag-D	mg/L	0.00019	<0.00001	0.00002	<0.00001	<0.00001	0.00005	0.00004	0.00005	0.00001
Al-D	mg/L	0.006	0.007	<0.005	0.01	<0.005	0.01	0.008	0.007	0.007
As-D	mg/L	0.0002	0.0002	0.0003	0.0041	0.0047	0.0009	0.0008	0.0005	0.0002
Ba-D	mg/L	0.034	0.1	0.095	0.11	0.111	0.106	0.088	0.091	0.011
B-D	mg/L	0.045	0.052	0.044	5.37	6.09	0.32	0.218	0.2	0.044
Be-D	mg/L	<0.00004	<0.00004	<0.00004	<0.00004	<0.00004	<0.00004	<0.00004	<0.00004	<0.00004
Bi-D	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Ca-D	mg/L	89.7	75.4	78.2	98.2	99.2	74.1	73.7	77.6	19.9
Cd-D	mg/L	0.00005	0.00008	0.00007	0.00009	0.00006	0.0002	0.00008	0.0001	0.00007
Co-D	mg/L	0.00102	0.00076	0.00078	0.00065	0.00062	0.00045	0.00057	0.00054	0.00024
Cr-D	mg/L	<0.0004	<0.0004	<0.0004	0.0036	0.0038	<0.0004	<0.0004	<0.0004	<0.0004
Cu-D	mg/L	0.012	0.02	0.018	0.004	0.003	0.019	0.022	0.022	0.005
Fe-D	mg/L	0.05	0.04	0.04	0.11	0.09	0.03	0.02	0.02	0.02
Hg-D	ug/L	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
K-D	mg/L	3.2	6.6	5.8	8.2	8.4	27	26	25	2.6
Li-D	mg/L	0.001	0.003	0.003	0.011	0.01	0.012	0.011	0.011	0.001
Mg-D	mg/L	22.9	18	19.1	62.6	63.1	16.5	14.2	14.9	2.4
Mn-D	mg/L	0.0802	0.228	0.189	0.27	0.261	0.161	0.135	0.137	0.0184
Mo-D	mg/L	0.0341	0.0892	0.0733	0.0442	0.0487	0.0806	0.101	0.104	0.0267
Na-D	mg/L	16.8	28	26.2	70.4	74.2	70.5	63	66.8	5.5
Ni-D	mg/L	0.004	0.002	0.002	0.004	0.003	0.008	0.004	0.004	0.002
Pb-D	mg/L	0.0001	<0.0001	<0.0001	0.0002	0.0002	0.0002	0.0001	<0.0001	0.0001
P-D	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01
Sb-D	mg/L	0.0053	0.0032	0.0008	0.0136	0.003	0.002	0.0021	0.0034	0.0021
S-D	mg/L	25.8	27.5	27.8	55.4	56.7	39	36.7	38.4	3.4
Se-D	mg/L	0.0028	0.0028	0.003	0.0067	0.0068	0.008	0.0067	0.0068	<0.0006
Si-D	mg/L	4.37	2.87	3.36	6.88	6.94	2.49	2.54	2.58	4.2
Sn-D	mg/L	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	0.0002	0.0002	<0.0001	<0.0001
Sr-D	mg/L	1.04	1.51	1.39	2.11	2.14	2.21	1.86	1.91	0.168
Te-D	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Th-D	mg/L	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
Ti-D	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Tl-D	mg/L	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
U-D	mg/L	0.0029	<0.0004	0.0008	0.0038	0.0039	0.001	0.0008	0.0008	<0.0004
V-D	mg/L	0.0002	0.0001	0.0001	0.0011	0.0012	0.0002	0.0001	0.0001	0.0002
Zn-D	mg/L	0.009	0.006	0.004	0.01	0.007	0.022	0.01	0.014	0.012
Zr-D	mg/L	<0.0001	0.0001	<0.0001	0.0001	0.0001	0.0001	<0.0001	<0.0001	<0.0001
<b>Total Metals</b>										
Ag-T	mg/L	0.00037	0.00013	0.00013	0.00024	0.00019	0.0104	0.00613	0.00377	0.00154
Al-T	mg/L	0.141	1.46	1.02	1.03	0.765	15.3	3.85	2.62	0.681
As-T	mg/L	0.0003	0.0009	0.0007	0.0053	0.005	0.0068	0.0007	0.0006	<0.0002
Ba-T	mg/L	0.037	0.138	0.122	0.136	0.132	1.35	0.183	0.16	0.028
Be-T	mg/L	<0.00004	<0.00004	0.00004	0.00004	<0.00004	0.00066	0.00008	0.00004	<0.00004
Bi-T	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001
B-T	mg/L	0.046	0.068	0.048	6.18	6.25	0.514	0.25	0.228	0.064
Ca-T	mg/L	85.9	73.2	70.9	96	95.1	85.5	74	74.4	20.4
Cd-T	mg/L	0.00004	0.00008	0.00008	0.00017	0.00016	0.00012	0.00013	0.00011	0.00008
Co-T	mg/L	0.00109	0.00156	0.00145	0.00144	0.00121	0.0175	0.00147	0.00128	0.00027
Cr-T	mg/L	0.0011	0.0052	0.0037	0.006	0.0054	0.003	0.002	0.0016	0.0013
Cu-T	mg/L	0.015	0.04	0.035	0.013	0.01	0.056	0.047	0.042	0.01
Fe-T	mg/L	0.324	2.68	1.65	1.76	1.28	44	4.93	3.47	0.673
Hg-T	ug/L	0.05	<0.01	0.02	<0.01	<0.01	0.02	0.02	0.02	0.01
K-T	mg/L	3.3	7.2	5.9	8.6	8.3	31	25.2	25.2	3
Li-T	mg/L	0.001	0.005	0.004	0.013	0.013	0.02	0.012	0.012	0.001
Mg-T	mg/L	22	18	17.8	62.2	61.9	21.8	14.6	14.6	2.54
Mn-T	mg/L	0.0935	0.309	0.248	0.34	0.332	6.78	0.287	0.256	0.0384
Mo-T	mg/L	0.0356	0.0944	0.0758	0.0481	0.0499	0.0742	0.108	0.114	0.0288
Na-T	mg/L	16.7	28.1	23.6	73.4	71.5	65.4	66.1	66.7	5.72
Ni-T	mg/L	0.004	0.005	0.004	0.006	0.005	0.01	0.005	0.005	0.002
Pb-T	mg/L	0.0001	0.0007	0.0005	0.0008	0.0006	0.004	0.0008	0.0006	0.0002
P-T	mg/L	<0.05	0.06	<0.05	<0.05	<0.05	0.19	0.07	0.05	<0.05
Sb-T	mg/L	0.0003	0.0012	0.0003	0.003	0.0038	<0.001	0.0008	0.0032	0.0025
Se-T	mg/L	0.0029	0.0032	0.0031	0.0072	0.0073	0.011	0.0078	0.0077	0.0007
Si-T	mg/L	4.54	7.01	5.12	9.32	8.46	38.1	9.99	7.55	5.49
Sn-T	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	0.0003	0.0002	<0.0001
Sr-T	mg/L	1.27	1.84	1.64	2.55	2.53	2.41	2.17	2.31	0.189
S-T	mg/L	27.6	28.5	28.2	60.5	59.9	41	39.1	39.8	3.8
Te-T	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0001	<0.0001	<0.0001
Th-T	mg/L	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.002	<0.0004	<0.0004	<0.0004
Tl-T	mg/L	<0.00001	0.00002	0.00001	0.00001	<0.00001	0.00016	0.00002	0.00002	<0.00001
U-T	mg/L	0.0032	0.0004	0.0008	0.0045	0.0044	0.002	0.0009	0.001	<0.0004
V-T	mg/L	0.0006	0.0046	0.0033	0.0036	0.0029	0.039	0.0065	0.005	0.0012
Zn-T	mg/L	0.007	0.029	0.019	0.024	0.018	0.13	0.036	0.033	0.033
Zr-T	mg/L	0.0002	0.0006	0.0004	0.0004	0.0004	0.0006	0.0004	0.0004	0.0001

## 5 Monitoring System Recommendations

- Pressure profiles and sampling for all monitoring locations should be conducted quarterly for a minimum of one year. At the end of this period, a review of all available hydrogeological data should be conducted and monitoring locations prioritized for sampling frequency (e.g., quarterly versus bi-annually or annually).
- In order to maintain a clear record of the installation, development, monitoring, and servicing that is carried out on each MP installation over time, a log of these events should be recorded in a Monitoring System Well Log. A sample log is attached in Appendix E. This information should be updated any time work is carried out on the MP well(s).

This report, **Minto Mine: Groundwater Monitoring System Installation Report**, has been prepared by SRK Consulting (Canada) Inc.:

**Prepared by**

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Chris Doughty, BSc, GIT  
Hydrogeologist

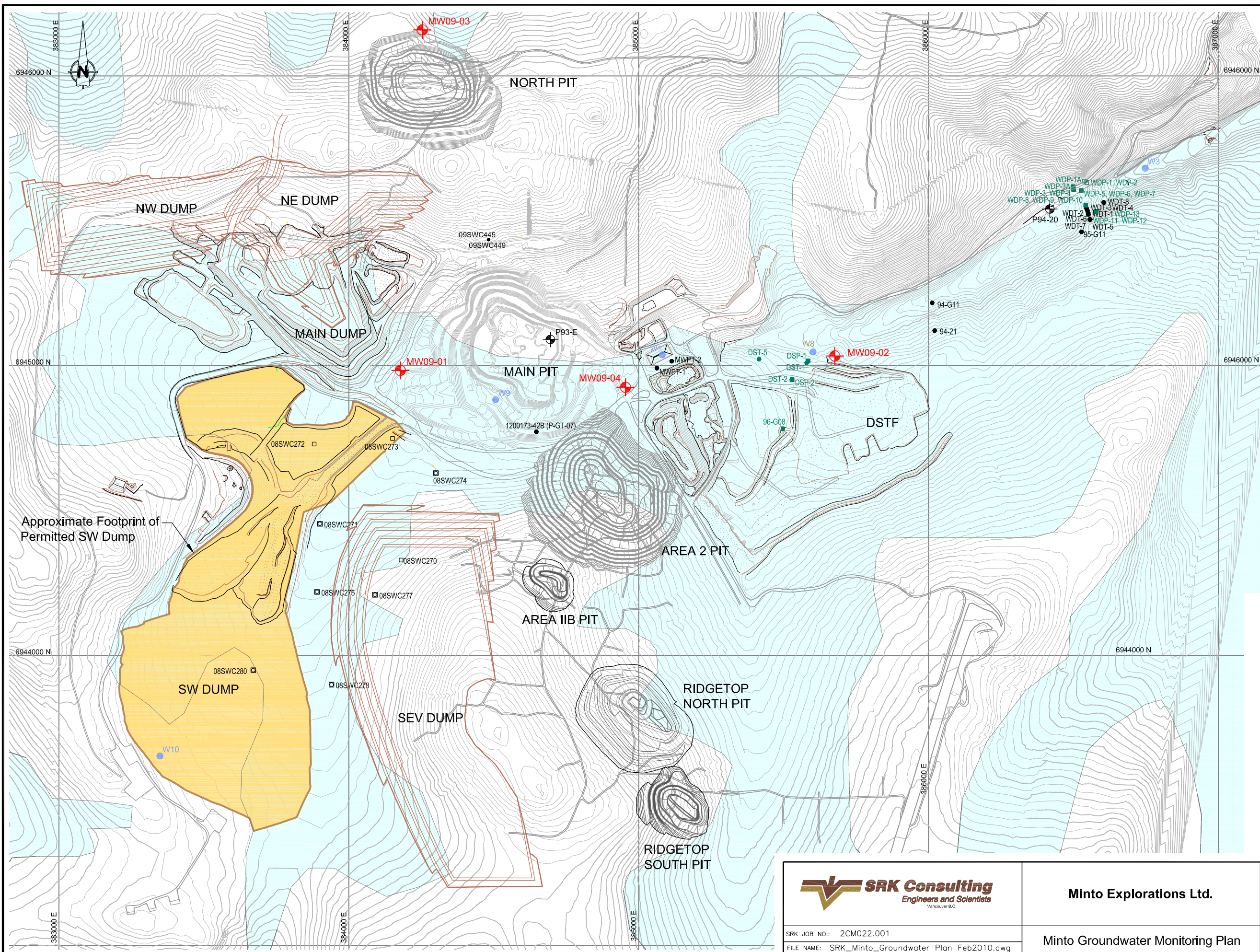
**Reviewed by**

---

Michael Royle, M.App.Sci., P.Geo. (BC & NT)  
Principal Hydrogeologist

**Figures**





**LEGEND**

- SURFACE WATER MONITORING LOCATIONS
- GROUND TEMPERATURE CABLE (T)
- GROUND TEMPERATURE CABLE (T) & CASAGRANDE PIEZOMETER (P)
- VIBRATING WIRE PIEZOMETER (P)
- CASAGRANDE PIEZOMETER (P)
- PERMAFROST (assumed; taken from HRP drawing of scollification areas, 1994)
- ⊕ MP WELL LOCATION

0 100 200 300 400 500  
Scale in Metres

**SRK Consulting**  
Engineers and Scientists  
Vancouver B.C.

SRK JOB NO.: 2CM022.001  
FILE NAME: SRK\_Minto\_Groundwater Plan Feb2010.dwg

**Minto Explorations Ltd.**

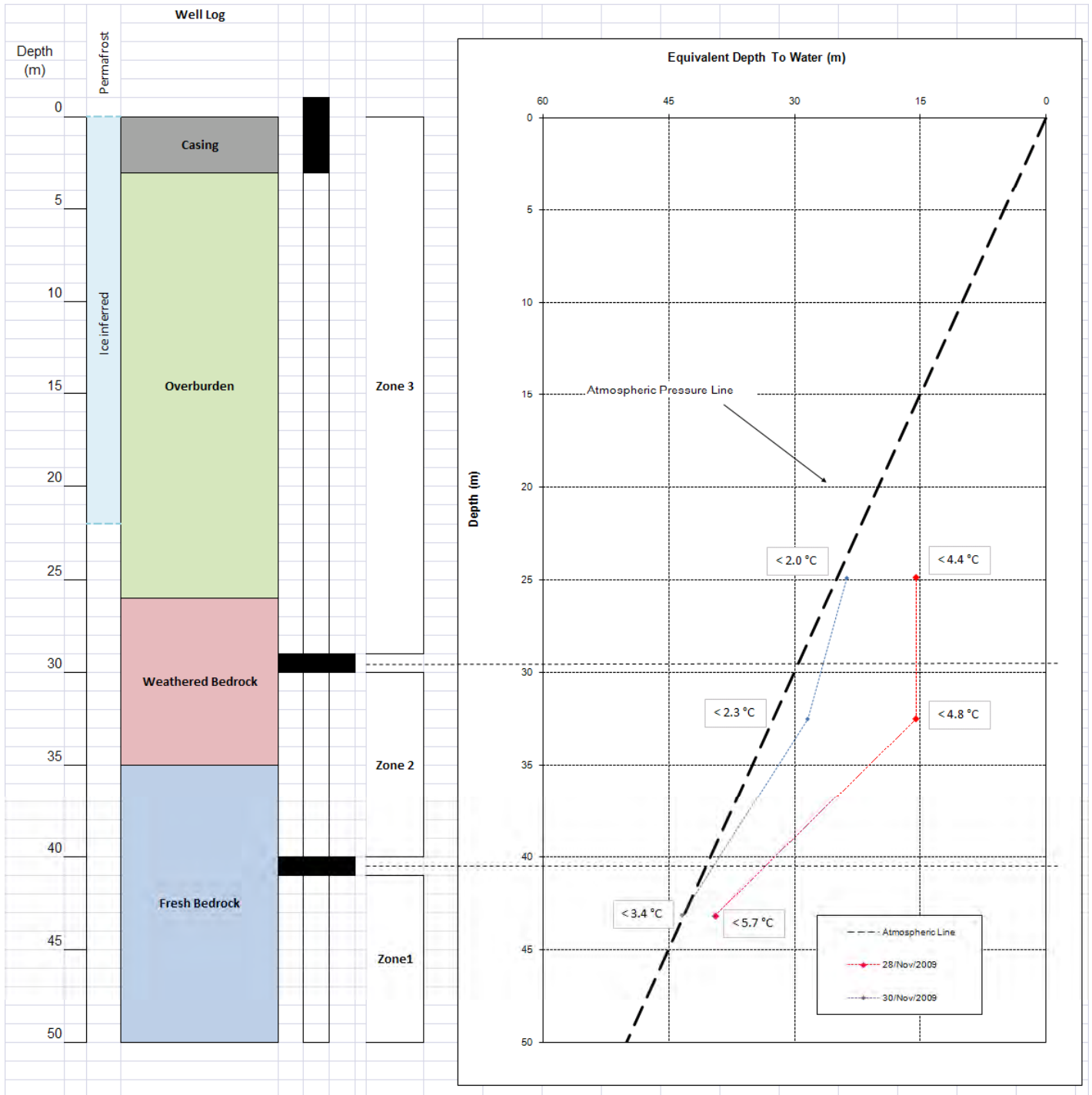
Minto Groundwater Monitoring Plan

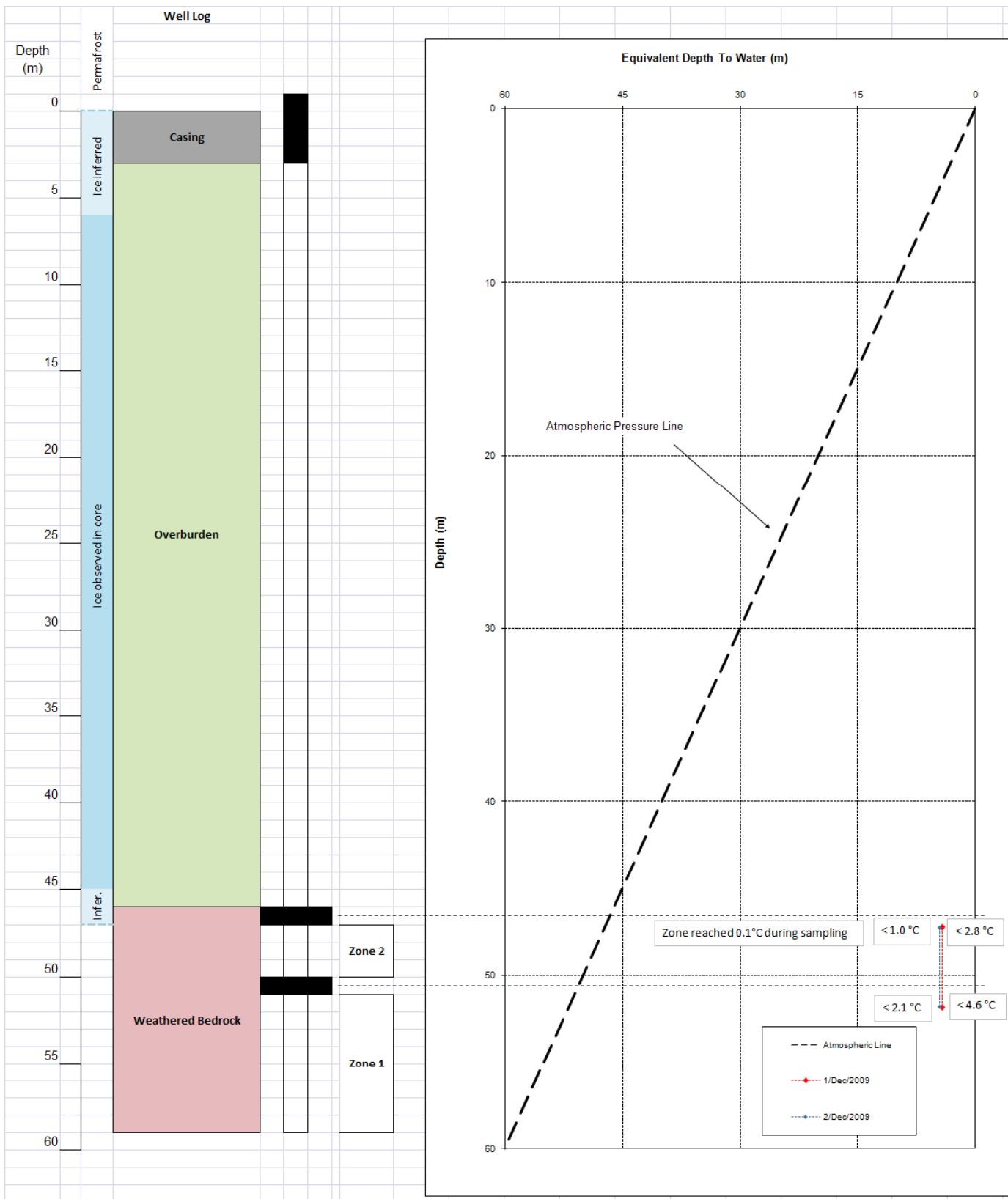
**Groundwater Monitoring Locations**

DATE: Feb. 5, 2010	APPROVED: MDR	FIGURE: 1
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Minto Explorations Ltd.

Groundwater Monitoring Locations

Job No: 2CM022.001

Minto Groundwater Monitoring Plan

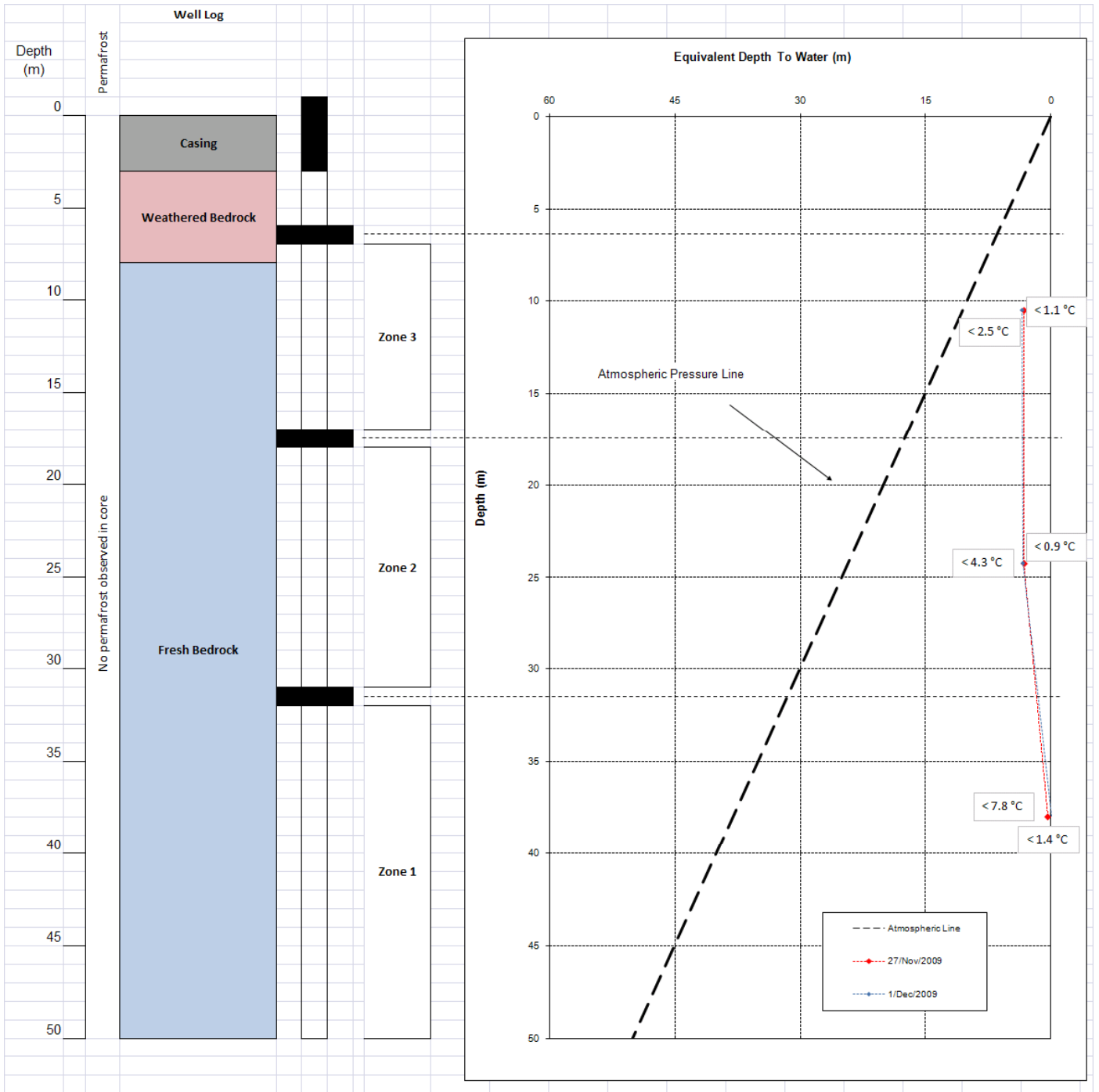
Date:  
February 9, 2010

Approved:  
MDR

Figure:

3

Filename: Fig 3\_SRK-09-02\_MP Casing Log and Pressure Data



Minto Explorations Ltd.

**Groundwater Monitoring Locations**

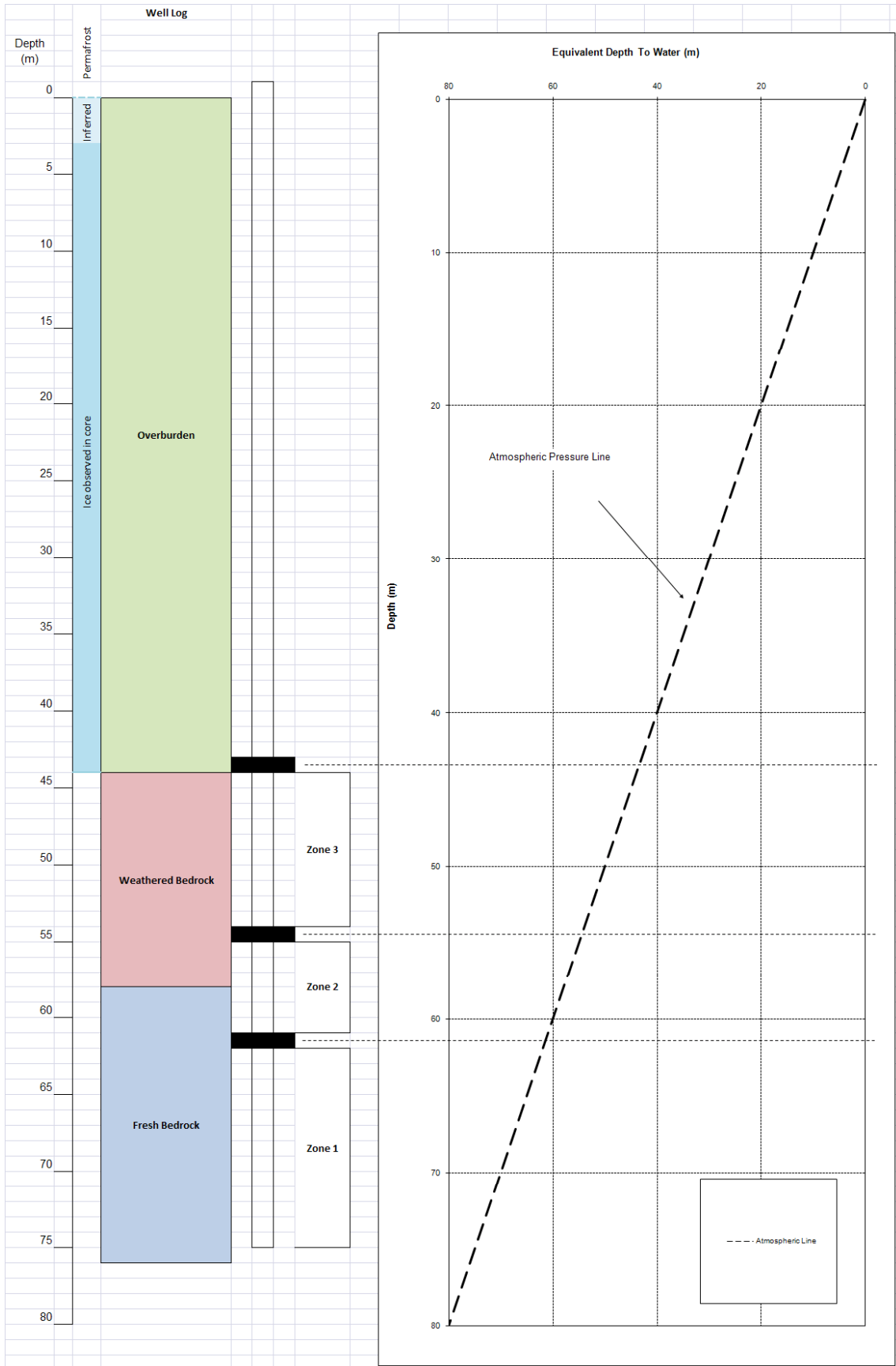
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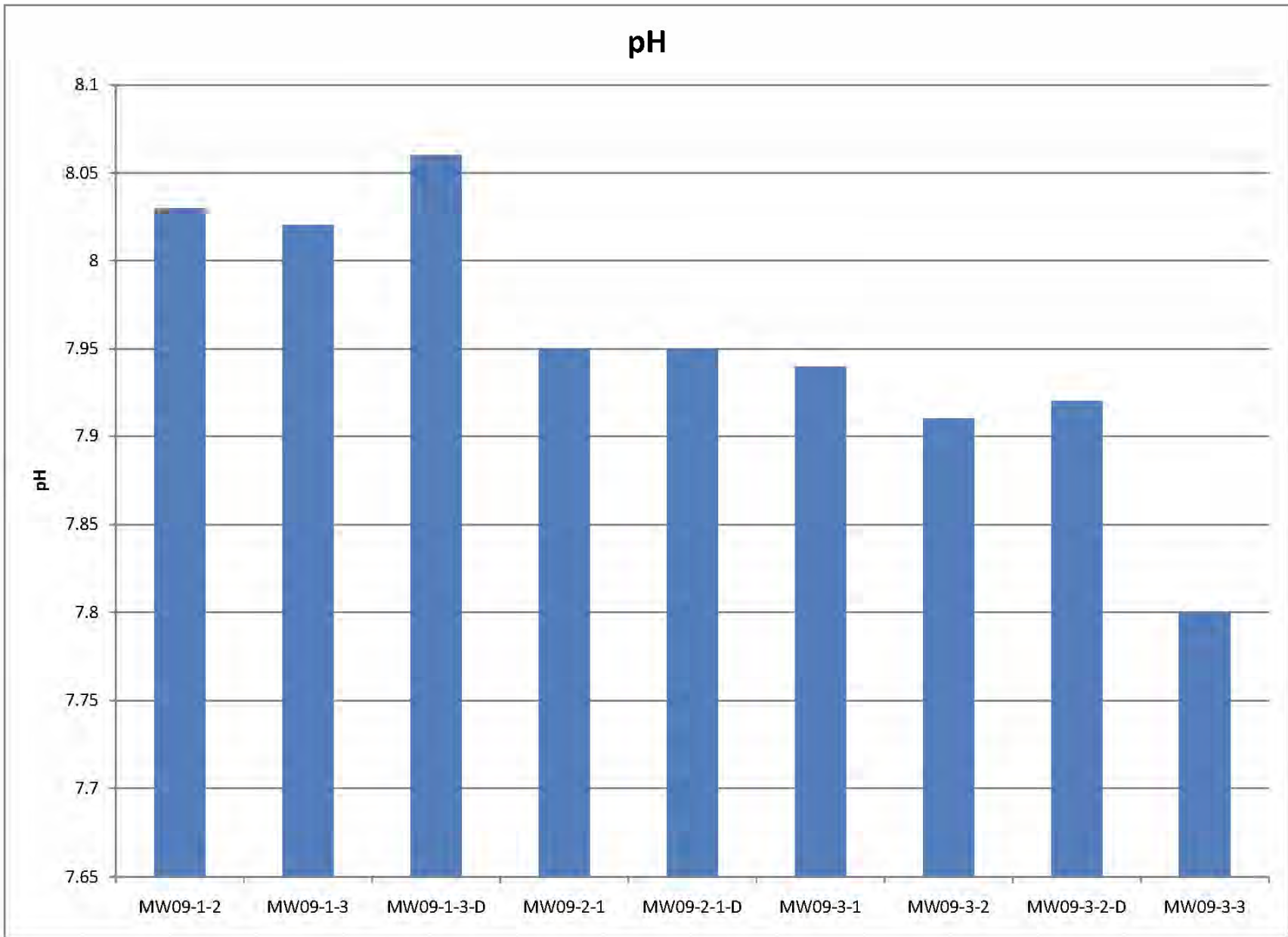
Minto Groundwater Monitoring Plan

Date: February 9, 2010

Approved: MDR

Figure: 4





**Minto Explorations Ltd.**

**Groundwater Monitoring Locations**

Job No: 2CM022.001

Filename: Fig 6\_pH.ppt

Minto Groundwater Monitoring Plan

Date:  
February 9, 2010

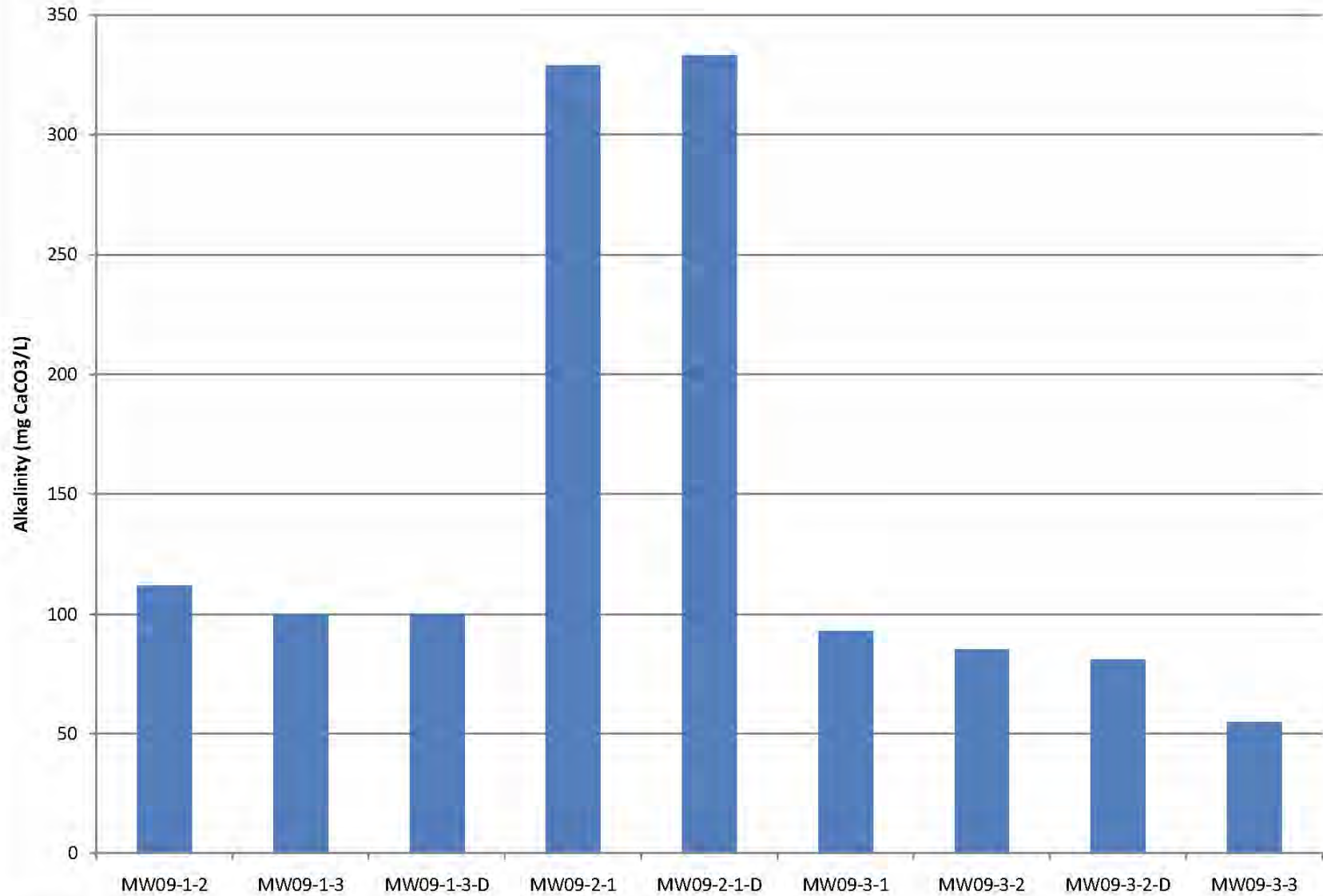
Approved:  
MDR

Figure:

**6**



# Alkalinity



**Minto Explorations Ltd.**

**Groundwater Monitoring Locations**

Job No: 2CM022.001  
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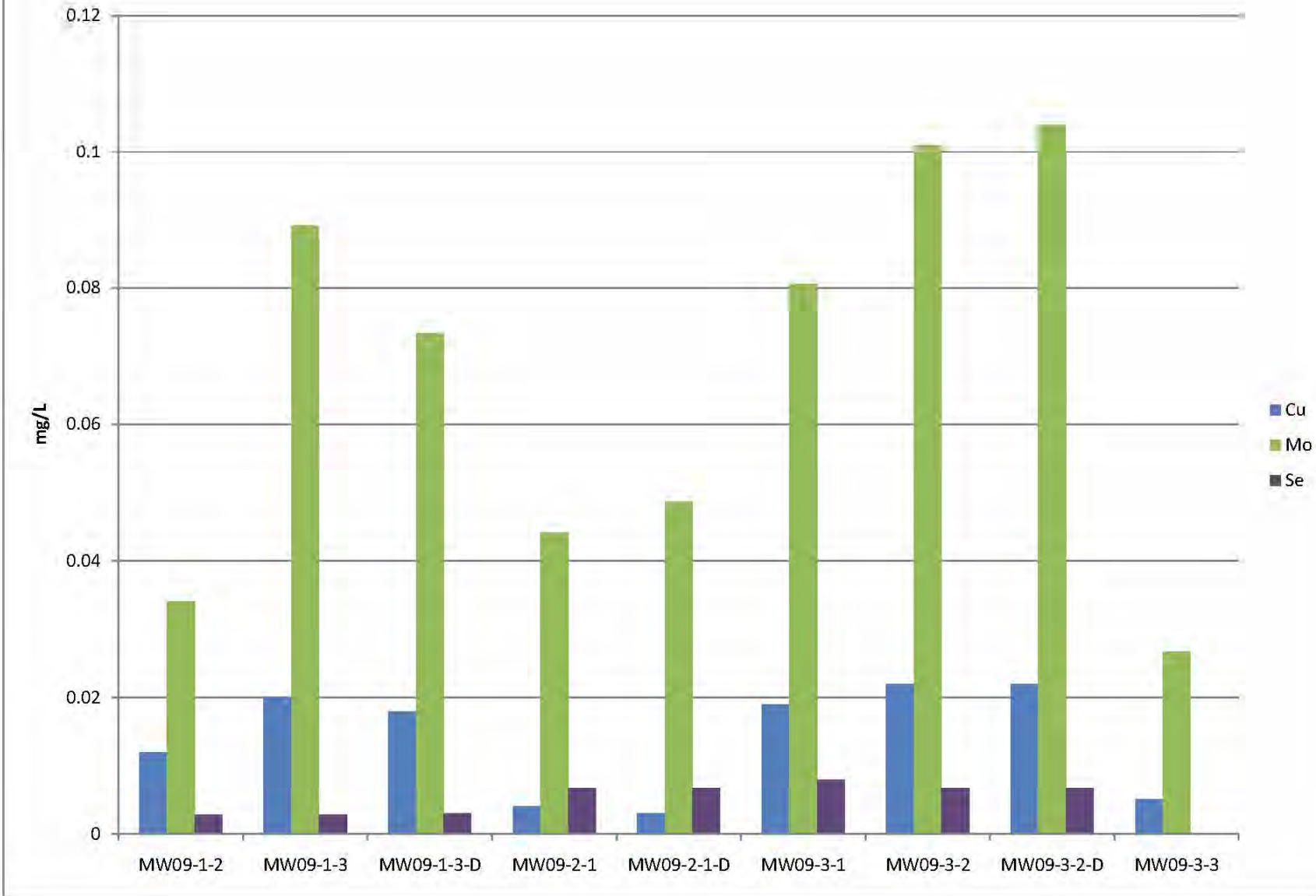
Minto Groundwater Monitoring Plan

Date:  
 February 9, 2010

Approved:  
 MDR

Figure: **7**

### Dissolved Metals: Cu, Mo, Se



Minto Explorations Ltd.

Groundwater Monitoring Locations

Job No: 2CM022.001

Filename: Fig 8\_pH.ppt

Minto Groundwater Monitoring Plan

Date: February 9, 2010

Approved: MDR

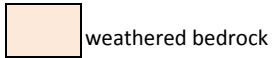
Figure: 8

**Appendix A**  
**Drillhole Logs**

# MW09-1



overburden



weathered bedrock



fresh bedrock

## Geotechnical log (basic+)

\* 10ft rods were used, with 5ft core barrel,  
HQ3 bit, with split tubes; casing depth 10ft

Run #	Run Interval				TCR					IRS		comment
	From	To	From	To	ft	inches	decimal ft	m	%	strong	weak	
	ft	ft	m	m								
1	10	15	3.05	4.57	1.5		1.50	0.46	30			
2	15	20	4.57	6.10	2		2.00	0.61	40			
3	20	25	6.10	7.62	3	2	3.17	0.97	63		S2	
4	25	30	7.62	9.14	1.5		1.50	0.46	30		S3	diamicton material (possibly reworked till)
5	30	35	9.14	10.67	1		1.00	0.30	20			
6	35	40	10.67	12.19	1	3	1.25	0.38	25			
7	40	45	12.19	13.72		8	0.67	0.20	13			
8	45	50	13.72	15.24	0		0.00	0.00	0			
9	50	55	15.24	16.76	1	9	1.75	0.53	35			
10	55	60	16.76	18.29	2	10	2.83	0.86	57		S1	
11	60	65	18.29	19.81		5	0.42	0.13	8			
12	65	70	19.81	21.34		5	0.42	0.13	8			
13	70	75	21.34	22.86	1		1.00	0.30	20			
14	75	77.5	22.86	23.62	4.5		4.50	1.37	180			sluff from drilling (c.sand), not actual recovery
15	77.5	85	23.62	25.91	2.5		2.50	0.76	33			overburden bottom

Run #	Run Interval				TCR					OF	J	CJ	+J from RZ	RQD		IRS		micro def. 0 to 3	J - properties	comment
	From	To	From	To	ft	inches	decimal ft	m	%					cm	%	strong	weak			
	ft	ft	m	m																
16	85	88	25.91	26.82	3.5		3.50	1.07	117	10	10		0.70	66%	R3			rusty colour fill + clay, J surface rough undulating	weathered bedrock, jointed, altered near joints and stained, but fresh away from joints, high FF	
18	88	97	26.82	29.57	3	6	3.50	1.07	39					65%	R3				poor recovery	
19	97	100	29.57	30.48	3		3.00	0.91	100	10	10		0.56	61%	R3					
20	100	105	30.48	32.00	5		5.00	1.52	100	7	6			90%	R4	RO		at 104.6ft v.weathered near Js, R0 near Js, clay in Js, orange colour		
21	105	110	32.00	33.53	5		5.00	1.52	100	8	7	1		90%	R4			same as above		
22	110	115	33.53	35.05	5		5.00	1.52	100	18	14	3	1.20	79%	R4	RO		same as above	10 cm R0 zone at 112.5ft	
23	115	120	35.05	36.58	5		5.00	1.52	100	11	7			60%	R4			same as above	Qz vein present	
24	120	125	36.58	38.10	5		5.00	1.52	100	8	7		1.40	92%	R4			high weathering at 3 J's; other Js only stained rusty or black	felsic dike present at 120.3ft	
25	125	130	38.10	39.62	5		5.00	1.52	100	7	5		1.45	95%	R4			rusty stained Js		
26	130	135	39.62	41.15	5		5.00	1.52	100	12	12		1.25	82%	R4			rusty stained Js		
27	135	140	41.15	42.67	5		5.00	1.52	100	7	5		1.47	96%	R4			rusty stained Js, or weathered Js		
28	140	145	42.67	44.20	4	9	4.75	1.45	95	8	5			100%	R4			black or rusty staining on Js		
29	145	150	44.20	45.72	5		5.00	1.52	100	6	4	2	1.35	89%	R4			black staining on Js	pink alteration colour at 148ft	
30	150	155	45.72	47.24	5		5.00	1.52	100	7	6	2	1.40	92%	R4			clean J walls, no weathering		
31	155	160	47.24	48.77	5		5.00	1.52	100	8	7		1.25	82%	R4			rusty/black stained Js, some weathered J walls		
32	160	165	48.77	50.29	5		5.00	1.52	100	4				100%	R4			rusty/black staining	EOH	

# MW09-1

## Overburden Properties

\* core runs with the same properties were combined

Domain interval				description	permafrost	samples	clay plasticity	clay hardness	
From	To	From	To					description (as found)	ISRM code
ft	ft	m	m						
10	25	3.05	7.62	artificial fill of cobbles, boulders, gravel, soil/reworked till	core hot from drilling, cannot determine ice presence in this borehole			soft	S2
25	30	7.62	9.14	fill: brown moist clayey sand (f-c), with f.gravel (angular) + c.gravel pieces, crumbly		S1 at 29.5ft			
30	55	9.14	16.76	fill: cobbles, boulders, gravel (voids found during drilling), fine gr. materials washed out if present			medium to low	very soft (reworked by drilling process)	S1
55	60	16.76	18.29	grey moist/wet diamict with silty clay matrix, containing angular to sub-round gravel, broken sharp rock pieces, and coarse sand		S2 at 59.5 ft	medium to low	very soft (reworked by drilling process)	S1
65	70	19.81	21.34	grey/white wet clean sub round to ang fine gravel					
70	75	21.34	22.86	sandy clay and grey wet clayey f-med sand with f-c gravel, sub ang to round			low	very soft (reworked by drilling process)	S1
75	85	22.86	25.91	m. gravel, rounded to sub ang, trace silt/clay (washed out)					

### clay hardness - quantitative measurements

Tor Vane (* 0.1 kg/cm <sup>2</sup> )	Penetrometer (kg/cm <sup>2</sup> )	Tor Vane (MPa)	Penetrometer (MPa)
1.1		0.01	
1.1		0.01	
0.8		0.01	

### ISRM Standard - Field Estimate of Rock Strength

Index	Description	Field Test	~ UCS (MPa)
<b>S1</b>	Very Soft Clay	Easily penetrated by fist (flows between fingers)	< 0.025
<b>S2</b>	Soft Clay	Easily penetrated by thumb (>1")	0.025 - 0.05
<b>S3</b>	Firm Clay	Penetrated by thumb with moderate effort (>1")	0.05 - 0.10
<b>S4</b>	Stiff Clay	Indented by thumb but penetrated with great effort	0.10 - 0.25
<b>S5</b>	Very Stiff Clay	Readily indented with thumbnail	0.25 - 0.50
<b>S6</b>	Hard Clay	Indented with difficulty by thumbnail	> 0.50
<b>R0</b>	Extremely Weak	indented by thumbnail, crumbles under soft blow of blunt end of hammer; breaks apart when crushed by fingers	0.25 - 1.0
<b>R1</b>	Very Weak	crumbles under firm blow of geologic hammer pick; peeled by knife	1.0 - 5.0
<b>R2</b>	Weak	shallow indentation under firm blow of pick end of geologic hammer	5.0 - 25
<b>R3</b>	Medium Strong	fractured with single firm blow of geologic hammer	25 - 50
<b>R4</b>	Strong	requires more than one blow of hammer to fracture	50 - 100
<b>R5</b>	Very Strong	requires many blows of hammer to fracture	100 - 250
<b>R6</b>	Extremely Strong	can only be chipped with strong blows of hammer	> 250

MW09-2

overburden

weathered bedrock

fresh bedrock

**Geotechnical log (basic+)**

\* 10ft rods were used, with 5ft core barrel,  
HQ3 bit, with split tubes; casing depth 10ft

Run #	Run Interval				TCR					OF	J	CJ	+J from RZ	RQD		IRS		micro def.	J - properties	comment
	From	To	From	To	ft	inches	decimal ft	m	%					cm	%	strong	weak			
	ft	ft	m	m																
1	10	15	3.05	4.57	1.5		1.50	0.46	30						0%					
2	15	17	4.57	5.18	2	6	2.50	0.76	125						0%					
3	17	25	5.18	7.62	5	3	5.25	1.60	66						0%	S4				
4	25	30	7.62	9.14	5		5.00	1.52	100						0%					
5	30	35	9.14	10.67	5		5.00	1.52	100						0%	S5				
6	35	40	10.67	12.19	4	10	4.83	1.47	97						0%	S4				
7	40	45	12.19	13.72	5		5.00	1.52	100						0%	S4				
8	45	50	13.72	15.24	5	2	5.17	1.57	103						0%	S4				
9	50	55	15.24	16.76	5		5.00	1.52	100						0%	S4				
10	55	60	16.76	18.29	5		5.00	1.52	100						0%	S4				
11	60	65	18.29	19.81	5		5.00	1.52	100						0%	S4				
12	65	70	19.81	21.34	5		5.00	1.52	100						0%	S5				
13	70	75	21.34	22.86	4		4.00	1.22	80						0%	S5				
14	75	80	22.86	24.38	5		5.00	1.52	100						0%	S5				
15	80	85	24.38	25.91	5		5.00	1.52	100						0%	S5				
16	85	90	25.91	27.43	3.5		3.50	1.07	70						0%	S5				
18	90	95	27.43	28.96	5		5.00	1.52	100						0%	S5				
19	95	100	28.96	30.48	2	3	2.25	0.69	45						0%	S5				
20	100	105	30.48	32.00	5		5.00	1.52	100						0%	S5				
21	105	110	32.00	33.53	3.5		3.50	1.07	70						0%	S5				
22	110	115	33.53	35.05	0		0.00	0.00	0							S5				
23	115	120	35.05	36.58	5		5.00	1.52	100						0%	S5				
24	120	125	36.58	38.10	5		5.00	1.52	100						0%	S3				
25	125	130	38.10	39.62	5	2	5.17	1.57	103						0%	S3				
26	130	135	39.62	41.15	5		5.00	1.52	100						0%	S4				
27	135	140	41.15	42.67	5		5.00	1.52	100						0%	S5	S4			
28	140	145	42.67	44.20	4		4.00	1.22	80						0%	S3				
29	145	150	44.20	45.72	5		5.00	1.52	100						0%					
30	150	155	45.72	47.24	5		5.00	1.52	100		38	38			0%	R0				
31	155	160	47.24	48.77	0.5		0.50	0.15	10		6	6			0%	R0				grey brown highly weahered curmbly / jointed rock
32	160	165	48.77	50.29	4.9		4.90	1.49	98		30	30			0%	R2	R0			stained J's, smooth, no gouge R0 crumbly to 163ft, then weak jointed
33	165	170	50.29	51.82	5		5.00	1.52	100	6	25	20			0%	R2	R0			red stained J's, weathered at J's highly weathered rock
34	170	173	51.82	52.73	2		2.00	0.61	67		16	16			0%	R2	R0			red stained J's, weathered at J's highly weathered rock
35	173	178	52.73	54.25	1	11	1.92	0.58	38	5	25	20			0%	R2	R0			red stained J's, weathered at J's highly weathered rock + one Qz vein
36	178	180	54.25	54.86		9	0.75	0.23	38	4	8	4			0%	R3	R0			black staining highly weathered rock
37	180	185	54.86	56.39		10	0.83	0.25	17		32	32			0%	R0				highly weathered rock
38	185	190	56.39	57.91		9	0.75	0.23	15	4	4				0%	R1				broken Qz pieces of Qz vein included
39	190	195	57.91	59.44	1	8	1.67	0.51	33		40	40			0%	R0				red stained J's





# MW09-3



overburden



weathered bedrock



fresh bedrock

## Geotechnical log (basic+)

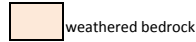
\* 10ft rods were used, with 5ft core barrel,  
HQ3 bit, with split tubes; casing depth 10ft

Run #	Run Interval				TCR					OF	J	CJ	+J from RZ	RQD		IRS		micro def. 0 to 3	J - properties	comment
	From	To	From	To	ft	inches	decimal ft	m	%					cm	%	strong	weak			
	ft	ft	m	m																
1	10	15	3.05	4.57	3.5		3.50	1.07	70	8	28	0	24	15	14%	R2	R0	2	brown stained J's	crumbly R0 zones, highly weathered
2	15	20	4.57	6.10	3	1	3.08	0.94	62	7	12	0	6	30	32%	R3	R0	2	planar rough, stained, alpha 45 deg	weathered rock, jointed, RZ (15cm) R0, minor Qz vein
3	20	25	6.10	7.62	5		5.00	1.52	100	13	9	0		123	81%	R3		2	7, 4   9   0 staining only; alpha 50 to 60 degrees	weathered rock, jointed
4	25	30	7.62	9.14	5	1	5.08	1.55	102	10	9	0		145	94%	R4	R3	1	4, 7, 8   1, 3, 0   0 brown non softening fill, alpha 60 to 80 degrees	slightly weathered rock / competent rock
5	30	35	9.14	10.67	5		5.00	1.52	100	6	3	0		147	96%	R4	R3	0	4 to 7   0   0, stained brown-orange	1 Qz vein
6	35	40	10.67	12.19	5		5.00	1.52	100	8	5	0		150	98%	R4	R3	0	4 to 8   0   0, stained brown-orange, alpha 50 to 70 degrees	
7	40	45	12.19	13.72	4	9	4.75	1.45	95	12	10	0		108	75%	R4	R3	0	7   0 to 3   0 stained orange, alpha 30 to 70 degrees	slightly altered from 41 to 43'
8	45	50	13.72	15.24	5	3	5.25	1.60	105	9	7	1		148	92%	R4	R3	0	7   0   0 stained orange, alpha 45	
9	50	55	15.24	16.76	5		5.00	1.52	100	6	3	0		150	98%	R5	R4	0	4 to 7   0   0, stained, alpha 45 to 70 degrees	
10	55	60	16.76	18.29	4	10.5	4.88	1.49	98	7	4	0		149	100%	R5	R4	0	4 to 7   0   0, slightly stained	very competent fresh rock, crs grained, 1 large vein
11	60	65	18.29	19.81	4	10.5	4.88	1.49	98	6	5	0		149	100%	R5	R4	0	4 to 7   0   0, no staining	
12	65	67	19.81	20.42	2	2	2.17	0.66	108	5	4	1		66	100%	R5	R3	0		competent grey/pink rock (logged from photo)
13	67	70	20.42	21.34	3	6	3.50	1.07	117	2	1	0		100	94%	R5	R4	0		
14	70	75	21.34	22.86	4	10	4.83	1.47	97	6	3	0		148	100%	R5	R4	0	J walls planar, undulating, rough, brown & altered; alpha 30 to 80 degrees	
15	75	80	22.86	24.38	4	10	4.83	1.47	97	6	5	0		138	94%	R5	R4	0	stained J's	grey brown rock, slightly altered
16	80	85	24.38	25.91	4	7.5	4.63	1.41	93	6	3	0		141	100%	R5	R4	0	all J's weathered with non softening fill, altered J wall; alpha 45 to 90 degrees	fluid flow evidence
18	85	90	25.91	27.43	5	2	5.17	1.57	103	4	4	0		149	95%	R5	R4	1		
19	90	95	27.43	28.96	5		5.00	1.52	100	11	6	4		149	98%	R5	R4	1	1 J with soft fill 0.5mm brown clay, alpha 15 degrees	
20	95	100	28.96	30.48	5	2	5.17	1.57	103	12	13	0	4	133	84%	R4	R2	0	1 J at 99' has 1 cm brown clay gauge fill (alpha 50 degrees)	RZ (10cm) jointed at 96'; R2 rock highly altered, brown from 95-96'
21	100	105	30.48	32.00	5		5.00	1.52	100	6	5	1		150	98%	R5	R4	0		
22	105	110	32.00	33.53	5	2	5.17	1.57	103	7	5	1		146	93%	R5	R4	1	1 J has 0.5mm soft fill	
23	110	115	33.53	35.05	5	1	5.08	1.55	102	10	11	3		122	79%	R5	R4	0		mineralization around micro defects at 111.5'
24	115	120	35.05	36.58	5	1	5.08	1.55	102	12	7	1		103	66%	R5	R4	1	hard fill in Js	
25	120	125	36.58	38.10	5	2	5.17	1.57	103	12	6	2		140	89%	R5	R4	1		
26	125	130	38.10	39.62	4	11	4.92	1.50	98	10	5	1		135	90%	R5	R4	1	1 J has 2mm soft fill	
27	130	135	39.62	41.15	5		5.00	1.52	100	14	14	0		62	41%	R5	R3	1		
28	135	140	41.15	42.67	5	2	5.17	1.57	103	8	6	1		141	90%	R5	R4	1		
29	140	145	42.67	44.20	5		5.00	1.52	100	9	7	0		150	98%	R5	R4	1		
30	145	150	44.20	45.72	5		5.00	1.52	100	7	5	0		137	90%	R5	R4	1		
31	150	155	45.72	47.24	5		5.00	1.52	100	7	4	1		144	94%	R5	R4	0		
32	155	160	47.24	48.77	4	10	4.83	1.47	97	10	5	1		133	90%	R5	R4	1	1 J has 2mm soft fill	
33	160	165	48.77	50.29	4	9	4.75	1.45	95	9	7	0		139	96%	R5	R4	0	Js betw 162-163' have 2mm of soft fill	

MW09-4



overburden



weathered bedrock



fresh bedrock

Geotechnical log (basic+)

\* 10ft rods were used, with 5ft core barrel, HQ3 bit, with split tubes; casing depth 10ft

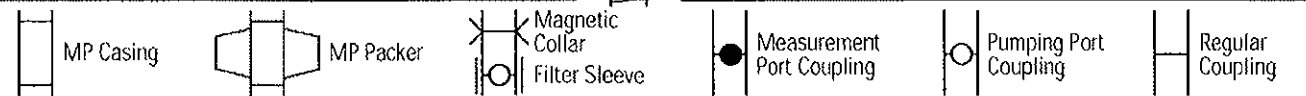
Run #	Run Interval				TCR					OF	J	CJ	+J from RZ	RQD		IRS		micro def.	J - properties	comment	
	From	To	From	To	ft	inches	decimal ft	m	%					cm	%	strong	weak				0 to 3
	ft	ft	m	m																	
1	5	6	1.52	1.83	1		1.00	0.30	100					0%	S3						
2	6	11	1.83	3.35	2.2		2.20	0.67	44					0%	S4						
3	11	15	3.35	4.57	3		3.00	0.91	75					0%	S4						
4	15	20	4.57	6.10	3.6		3.60	1.10	72					0%	S3						
5	20	25	6.10	7.62	5		5.00	1.52	100					0%	S4	S2					
6	25	30	7.62	9.14	5		5.00	1.52	100					0%	S4						
7	30	35	9.14	10.67	5		5.00	1.52	100					0%	S4						
8	35	40	10.67	12.19	5		5.00	1.52	100					0%	S4	S3					
9	40	45	12.19	13.72	4		4.00	1.22	80					0%	S4						
10	45	50	13.72	15.24	5		5.00	1.52	100					0%	S4						
11	50	55	15.24	16.76	4.2		4.20	1.28	84					0%	S4						
12	55	60	16.76	18.29	5		5.00	1.52	100					0%	S4						
13	60	65	18.29	19.81	5		5.00	1.52	100					0%	S4						
14	65	70	19.81	21.34	5		5.00	1.52	100					0%	S4	S3					
15	70	75	21.34	22.86	5		5.00	1.52	100					0%	S4						
16	75	80	22.86	24.38	5		5.00	1.52	100					0%	S4						
18	80	85	24.38	25.91	5		5.00	1.52	100					0%	S4						
19	85	90	25.91	27.43	5		5.00	1.52	100					0%	S4						
20	90	95	27.43	28.96	0		0.00	0.00	0						S4						
21	95	100	28.96	30.48	5		5.00	1.52	100					0%	S4						
22	100	105	30.48	32.00	3		3.00	0.91	60					0%	S4						
23	105	110	32.00	33.53	5.2		5.20	1.58	104					0%	S4						
24	110	115	33.53	35.05	5		5.00	1.52	100					0%	S4						
25	115	120	35.05	36.58	5		5.00	1.52	100					0%	S4						
26	120	125	36.58	38.10	5		5.00	1.52	100					0%	S4						
27	125	130	38.10	39.62	5		5.00	1.52	100					0%	S4						
28	130	135	39.62	41.15	5		5.00	1.52	100					0%	S4						
29	135	140	41.15	42.67	5		5.00	1.52	100					0%	S4						
30	140	145	42.67	44.20	4.2		4.20	1.28	84					0%	S4						
31	145	150	44.20	45.72	4.8		4.80	1.46	96		60	60	0	0%	R0	S4			highly weathered rock (brown and pink rock fragments, light brown-orange crs.sand and f.gravel), low clay content (10%)		
32	150	155	45.72	47.24	5		5.00	1.52	100	51	51	0	48	0	0%	R2	R0	1	R0 rock most of this run	highly wethered rock (brown-orange c.sand, clayey, altered rock frags, Qz vein, very weak rock)	
33	155	160	47.24	48.77	5		5.00	1.52	100	7	9	0	8	152	100%	R3	R0	1	R0 zone 20cm (also jointed)	highly wethered rock, orange-brown alteration, black/white coarse grains remaining of rock; competent rock at 159ft	
34	160	165	48.77	50.29	3	4	3.33	1.02	67	7	6	0		24	24%	R3	R1	1	soft/hard fill in J's	very weathered jointed rock	
35	165	170	50.29	51.82	5		5.00	1.52	100	6	5	0		80	52%	R3	R2	1	soft fill in J's or red staining,	weathered jointed rock	
36	170	175	51.82	53.34	5		5.00	1.52	100	9	4	0		140	92%	R3	R2	0	crs. fill in J's, red staining	weathered jointed rock	
37	175	180	53.34	54.86	5	3	5.25	1.60	105	8	7	0		136	85%	R4	R2	0			
38	180	185	54.86	56.39	4	10	4.83	1.47	97	9	8	0	4	137	93%	R4	R0	2	black stained J's or crs.fill	RZ (10cm) at litho change, R0 rock	
39	185	190	56.39	57.91	5	2	5.17	1.57	103	8	2	0		140	89%	R4	R2	0	black rusty staining on all J's		
40	190	195	57.91	59.44	5	1	5.08	1.55	102	10	8	0		143	92%	R4		0	black rusty staining on all J's		
41	195	199.5	59.44	60.81	4	5	4.42	1.35	98	12	8	0		82	61%	R4		0	stained J's, various colours and minerals		
42	199.5	205	60.81	62.48	5	3	5.25	1.60	95	9	6	1		136	85%	R5	R3	0	hard fill on J surfaces		
43	205	210	62.48	64.01	5		5.00	1.52	100	9	7	0		137	90%	R5	R4	0	hard fill on J surfaces		
44	210	215	64.01	65.53	5		5.00	1.52	100	10	10	0		78	51%	R4	R3	0	hard fill on J surfaces		
45	215	220	65.53	67.06	5	2	5.17	1.57	103	14	10	0		93	59%	R4	R1	0	hard fill on J surfaces		
46	220	225	67.06	68.58	5	2	5.17	1.57	103	7	5	0		158	100%	R4	R3	0	hard fill on J surfaces		
47	225	230	68.58	70.10	5		5.00	1.52	100	11	8	0		135	89%	R4		1			
48	230	235	70.10	71.63	5		5.00	1.52	100	13	9	0		85	56%	R4	R2				
49	235	240	71.63	73.15	4		4.92	1.50	98	6	1	0		150	100%	R5					
50	240	245	73.15	74.68	5		5.00	1.52	100	10	9	0		132	87%	R4	R3				
51	245	250	74.68	76.20	4	9	4.75	1.45	95	10	8	0		70	48%	R4				bright green mineralization on J surfaces	



**Appendix B**  
**MP Monitoring Well Casing Design and Installation Records**

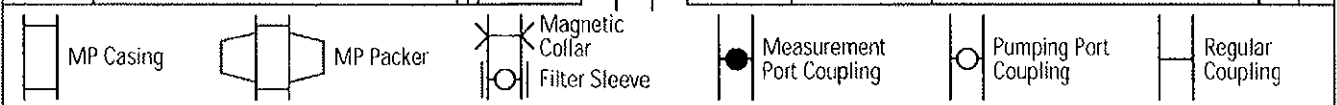
Project: MINTO 2CM022.007.001.10 WB Ref.: \_\_\_\_\_  
 Location: WEST PIT Hole No.: MW09-1 Installed by: JS, CD  
 Hole Depth: 165 FT MP Depth: 165 FT Hole Diameter: HQ Date Installed: 28 NOV '09  
 Measurement Datum: GROUND SURFACE Datum Elevation: 857.6 m Date Drawn: 19 JAN '10

Depth, FT	Geological Description	Geologic Log	MP Casing Log	Serial No. Batch No.	Final Packer Pressure/Volume	Comments	Joint	
							Install	Test
			18			0.23 m from ground surface to top of piece 17.		
10	FILL		17					
20			16					
30			15					
40			14					
50			13					
60			12					
70			11					
80			10					
90	WEATHERED BEDROCK		9	2801				
100			8	17025	600 PSI 6.5 L	VALVE OPEN 170 PSI		



Project: MINTD ZCM027.007.001.10 WB Ref.: \_\_\_\_\_  
 Location: WEST PIT Hole No.: MWD9-1 Installed by: JS, CD  
 Hole Depth: 165 FT MP Depth: 165 FT Hole Diameter: HQ Date Installed: 28 NOV '09  
 Measurement Datum: GROUND SURFACE Datum Elevation: 857.6 m Date Drawn: 19 JAN '10

Depth, FT	Geological Description	Geologic Log	MP Casing Log	Serial No. Batch No.	Final Packer Pressure/Volume	Comments	Joint	
							Install	Test
100	WEATHERED BEDROCK		7					
110			6	2803				
120	COMPETENT BEDROCK		5	7955				
130			4	17026	670 PSI 4.0 L	VALVE OPEN 165 PSI		
140			3	2800				
150			2	7957				
160	END OF HOLE AT 165 FT		1					
170								



SRK Consulting.



Sheet 1 of 2

# Westbay Packer Inflation Record

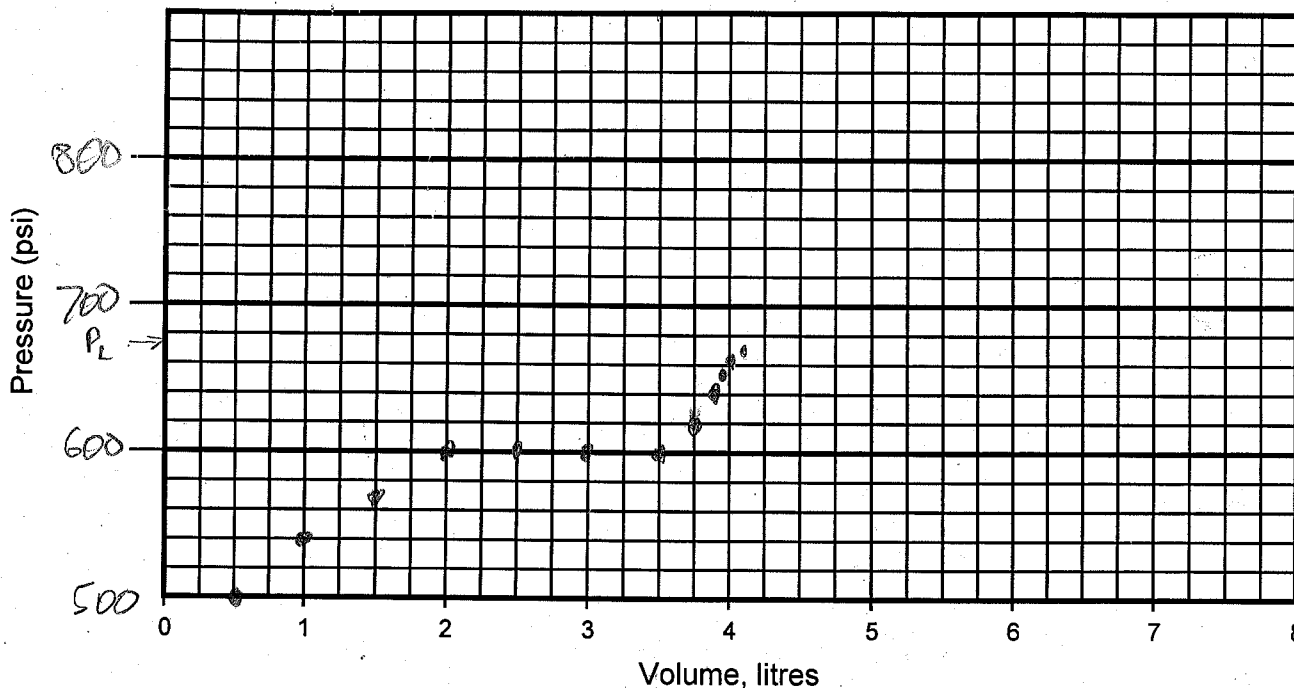
Project: Minto Project No.: 2CM022-007-001.10 Well No.: MW09-1  
 Location: West Pit Completed by: CD, JS Date Inflated: 28 Nov 09  
 Packer No. 4 Serial # 17026 Depth (ft) (m): 130 ft Inflation Tool No.: \_\_\_\_\_  
 Packer Valve Pressure, P<sub>V</sub>: 165 psi Final Line Pressure, P<sub>L</sub>: 677 psi Tool Pressure, P<sub>T</sub>: 400 psi  
 Borehole Water Level: 33.65 (ft) (m) = 47.8 psi (P<sub>w</sub>)

$$P_L = P_E + P_V + P_T - P_w$$

$$= 160 + 165 + 400 - 48 = 677$$

$$P_E = P_L + P_w - P_V - P_T = 160$$
 psi

Volume, litres	0.5	1.0	1.5	2.0	2.5	3.0	3.5	3.75	3.85	3.95
Pressure, psi	500	540	570	600	600	600	600	620	640	650
Volume, litres	4.05	4.10		4.0 L final V						
Pressure, psi	660	670								



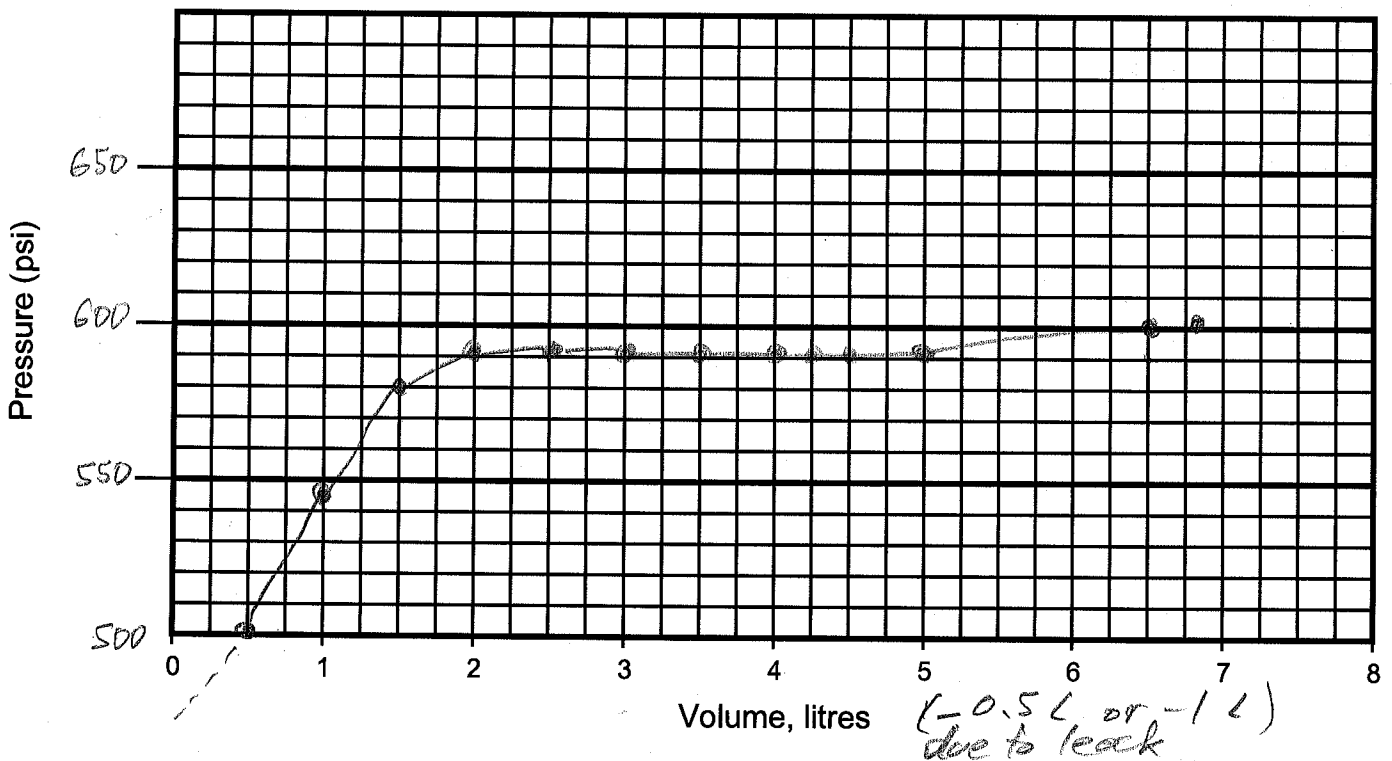
Comments: Packer # normal inflation

Time 14:10

# Packer Inflation Record

Project: Mato 2CM022.007.001.10 Project No.: \_\_\_\_\_ Well No.: MW08-1  
 Location: West pit Completed by: C.D./JS Date Inflated: Nov 27 '09  
 Packer No. 8 s/n 17025 Depth (ft/m): 95 ft Inflation Tool No.: \_\_\_\_\_  
 Packer Valve Pressure, P<sub>V</sub>: 170 psi Final Line Pressure, P<sub>L</sub>: 682 psi Tool Pressure, P<sub>T</sub>: 400 psi  
 Borehole Water Level: 33.65 (ft/m) = 47.8 psi (P<sub>w</sub>)  
 Calculated Packer Element Pressure, P<sub>E</sub> = P<sub>L</sub> + P<sub>w</sub> - P<sub>V</sub> - P<sub>T</sub> = 160 psi

Volume, litres	0.5	1.0	1.5	2.0	2.5	3.0	3.5	3.75	4.0	4.25
Pressure, psi	500	540	580	590	590	590	590	590	590	590
Volume, litres	4.5	5.0	6.5	6.8		6.75*	* pinned vol. (actual 6.75 to 6.5 L because of leak)			
Pressure, psi	590	590	600	600						



Comments: Packer # loss of water volume (0.5 L approx Time - 15:00  
from water filter leak before pump intake), and perhaps other leak?  
- stopped because reached packer vol. limit (inflated in weak weak  
rock zone)



Project: MINTO 2CM022.007.001.10 WB Ref.: \_\_\_\_\_

Location: LOWER TAILINGS Hole No.: MW09-2 Installed by: JS, CD

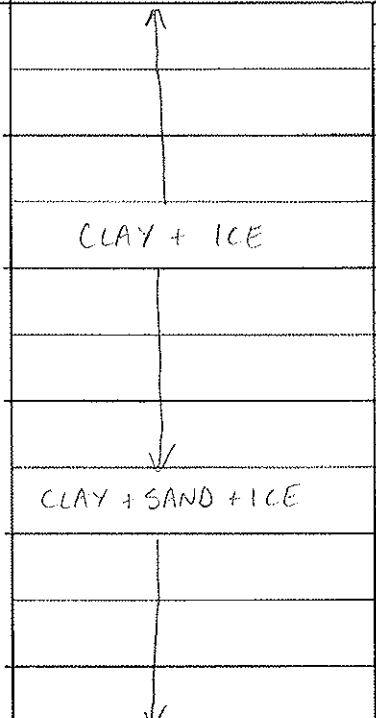
Hole Depth: 195 FT MP Depth: 195 FT Hole Diameter: HQ Date Installed: 26 NOV '09

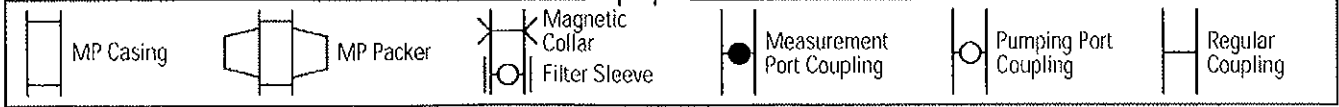
Measurement Datum: GROUND SURFACE Datum Elevation: 757.5 m Date Drawn: 19 JAN '10

Depth, FT	Geological Description	Geologic Log	MP Casing Log	Serial No. Batch No.	Final Packer Pressure/Volume	Comments	Joint	
							Install	Test
10			22					
20	CLAY + ICE PERMAFROST		21					
30			20					
40			19					
50			18					
60			17					
70			16					
80			15					
90			14					
100			13					



Project: MINTO 2CM022.007.001.10 WB Ref.: \_\_\_\_\_  
 Location: LOWER TAILINGS Hole No.: MW09-2 Installed by: JS, CD  
 Hole Depth: 195 FT MP Depth: 195 FT Hole Diameter: HQ Date Installed: 26 NOV '09  
 Measurement Datum: GROUND SURFACE Datum Elevation: 757.5 m Date Drawn: 19 JAN '10

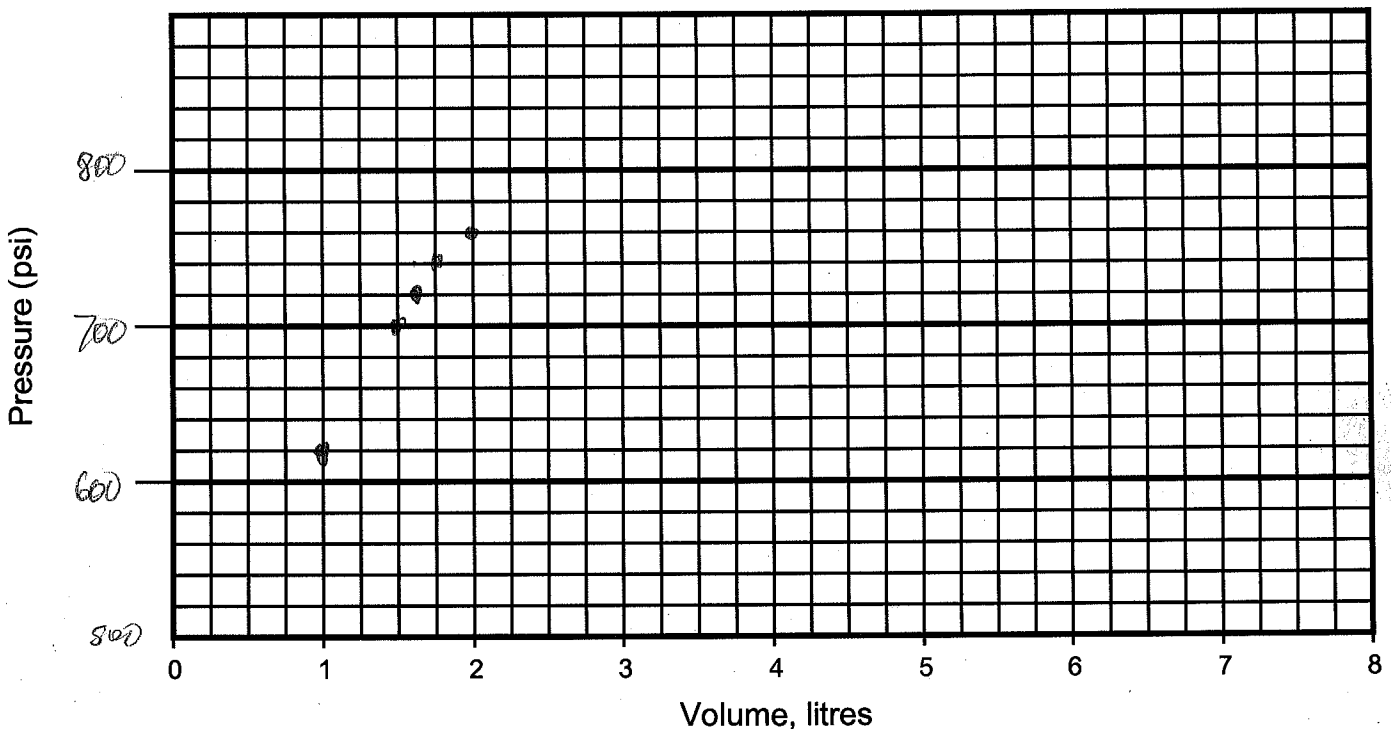
Depth, FT	Geological Description	Geologic Log	MP Casing Log	Serial No. Batch No.	Final Packer Pressure/Volume	Comments	Joint		
							Install	Test	
100	 <p>CLAY + ICE</p> <p>CLAY + SAND + ICE</p> <p>WEATHERED BEDROCK</p> <p>WEAK JOINTED ROCK</p> <p>VERY POOR CORE RECOVERY</p> <p>END OF HOLE AT 195 FT</p>		12						
110			11						
120			10						
130			9						
140			8						
150			7	M	17022	760 PSI 4.75 L	MAG COLLAR AT TOP OF PACKER		
160			6		2799				
170			5		7958				
180			4	M	17021	760 PSI 1.75 L	MAG COLLAR AT TOP OF PACKER		
190			3		2794				
200	2		7951						
	1								



# Packer Inflation Record

Project: Minto Project No.: \_\_\_\_\_ Well No.: MW09-2  
 Location: Lower Tailings Completed by: J Scibek Date Inflated: Nov 26 '09  
 Packer No. 4 s/n 17021 Depth (ft) m): 170 Inflation Tool No.: \_\_\_\_\_  
 Packer Valve Pressure, P<sub>V</sub>: 165 psi Final Line Pressure, P<sub>L</sub>: 755 psi Tool Pressure, P<sub>T</sub>: 425 psi  
 Borehole Water Level: 3.0 (ft) (m) = \_\_\_\_\_ psi (P<sub>W</sub>)  
 Calculated Packer Element Pressure, P<sub>E</sub> = P<sub>L</sub> + P<sub>W</sub> - P<sub>V</sub> - P<sub>T</sub> = 165 psi

Volume, litres	1.0	1.5	1.6	1.75	2.0		1.75	L final Volume	
Pressure, psi	620	700	720	740	760	Final P			
Volume, litres									
Pressure, psi									

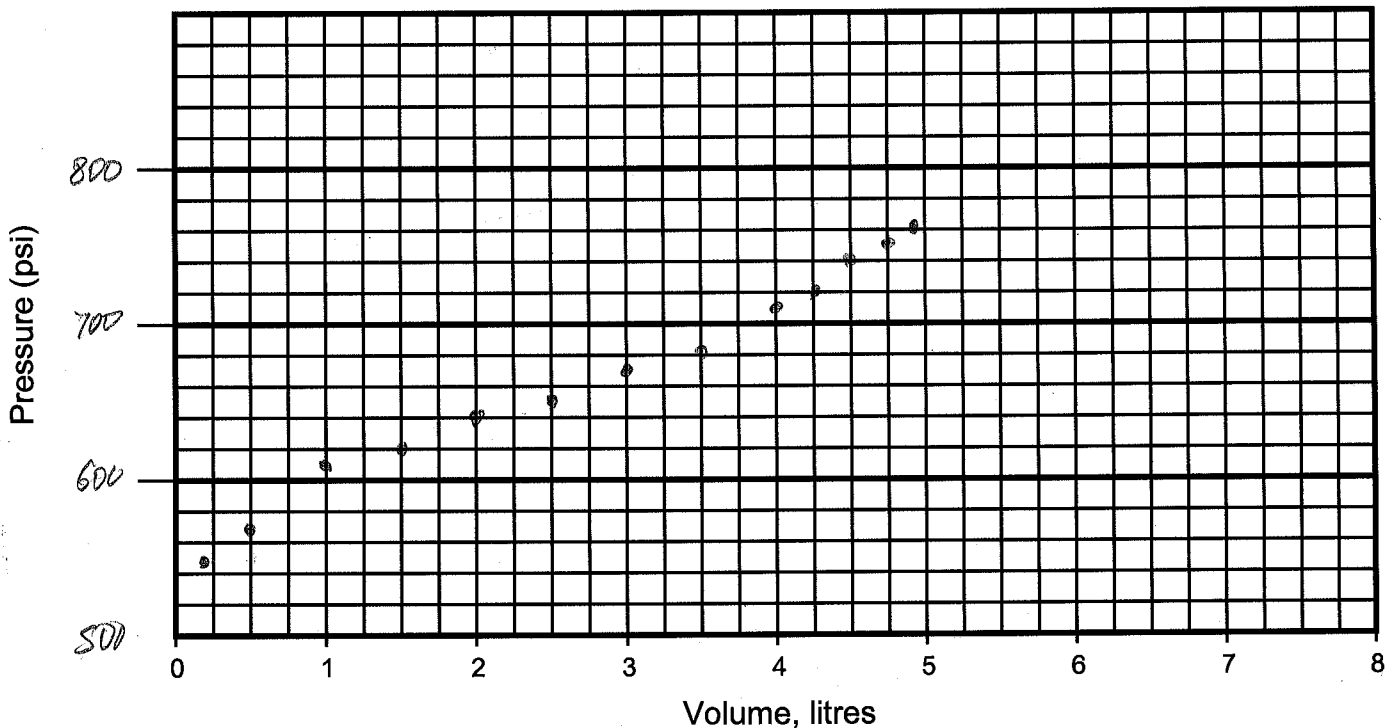


Comments: Packer # hole probably collapsed around packer Time - 20:30  
 resulting in small volume inflated; packer is just above  
 zone of weak weath. rock (R<sub>3</sub> strength) with poor core recovery

# Packer Inflation Record

Project: Minto Project No.: \_\_\_\_\_ Well No.: MW09-2  
 Location: Lower Tailings Completed by: J Scibek Date Inflated: Nov 26 '09  
 Packer No. 7 S/n 17022 Depth (ft/m): 160 ft Inflation Tool No.: \_\_\_\_\_  
 Packer Valve Pressure, P<sub>V</sub>: 170 psi Final Line Pressure, P<sub>L</sub>: 755 psi Tool Pressure, P<sub>T</sub>: 425 psi  
 Borehole Water Level: 3 (ft/m) = 4 psi (P<sub>W</sub>)  
 Calculated Packer Element Pressure, P<sub>E</sub> = P<sub>L</sub> + P<sub>W</sub> - P<sub>V</sub> - P<sub>T</sub> = 160 psi

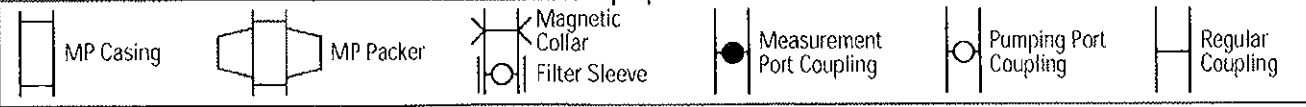
Volume, litres	0.2	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.25
Pressure, psi	550	570	610	620	640	650	670	680	710	720
Volume, litres	4.50	4.75	4.9		4.75 L final volume					
Pressure, psi	740	750	760							



Comments: Packer # inflated normally Time - 21:00

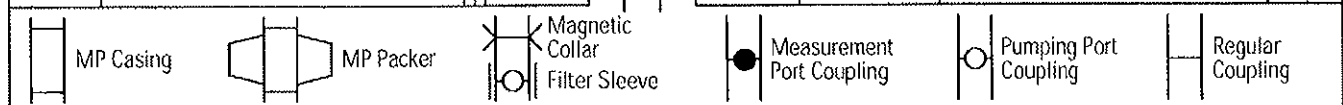
Project: MINTO 2CM027.007.001.10 WB Ref.: \_\_\_\_\_  
 Location: MINTO NORTH Hole No.: MW09-3 Installed by: JS, CD  
 Hole Depth: 165 FT MP Depth: 165 FT Hole Diameter: HQ Date Installed: 27 NOV '09  
 Measurement Datum: GROUND SURFACE Datum Elevation: 908.0 m Date Drawn: 19 JAN '10

Depth, FT	Geological Description	Geologic Log	MP Casing Log	Serial No. Batch No.	Final Packer Pressure/Volume	Comments	Joint	
							Install	Test
	WELL CASING		18			2.9 m from top of casing to top of piece 17.		
10	WEATHERED BEDROCK		17					
20	COMPETENT ROCK		16	17023	740 PSI 3.9 L	VALVE OPEN 170 PSI		
30			15					
40	STAINED JOINTS, ALTERATION		14	2805				
50			13	7956				
60			12	17028	740 PSI 3.75 L	VALVE OPEN 165 PSI		
70			11					
80			10	2802				
90	R2 ROCK, HIGHLY ALTERED		9	7949				
100			8					



Project: MINTO 2CM027.007.001.10 WB Ref.: \_\_\_\_\_  
 Location: MINTO NORTH Hole No.: MW09-3 Installed by: JS, CD  
 Hole Depth: 165 FT MP Depth: 165 FT Hole Diameter: HQ Date Installed: 27 NOV '09  
 Measurement Datum: GROUND SURFACE Datum Elevation: 908.0 m Date Drawn: 19 JAN '10

Depth	Geological Description	Geologic Log	MP Casing Log	Serial No. Batch No.	Final Packer Pressure/Volume	Comments	Joint	
							Install	Test
100	COMPETENT BEDROCK		7	17027	750 PSI 3.75 L	VALVE OPEN 170 PSI		
110			6					
120			5					
130			4	2804				
140			3	7950				
150			2					
160	END OF HOLE 165'		1					
170								

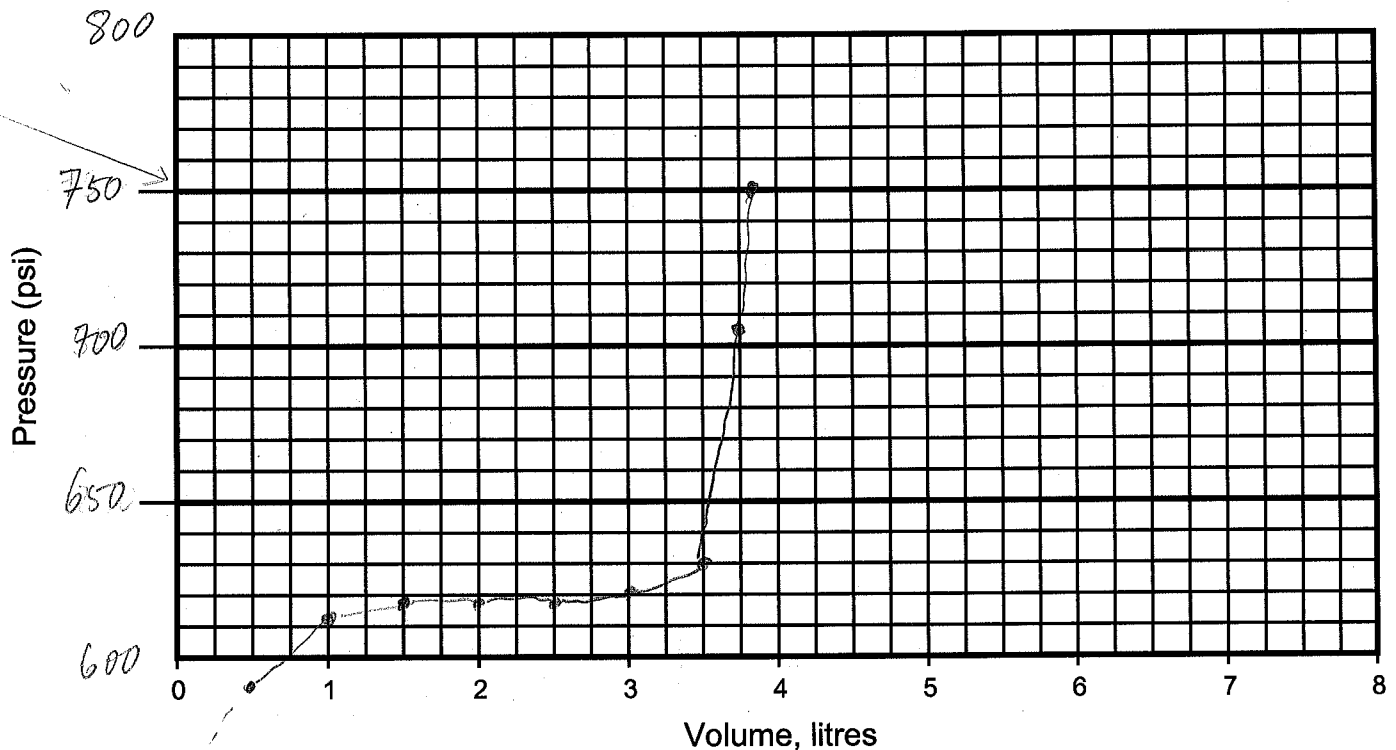


# Packer Inflation Record

Project: Minto Project No.: 2CM022.007.001-10 Well No.: MW09-3  
 Location: Minto North Completed by: CD/JS Date Inflated: 27 Nov 09  
 Packer No. 7 Serial# 17027 Depth (ft/m): 100 ft Inflation Tool No.:         
 Packer Valve Pressure, P<sub>V</sub>: 170 psi Final Line Pressure, P<sub>L</sub>: 754 psi Tool Pressure, P<sub>T</sub>: 425 psi  
 Borehole Water Level: 4 (ft/m) = 1 psi (P<sub>W</sub>)

Calculated Packer Element Pressure,  $P_E = P_L + P_W - P_V - P_T =$  160 psi  
 $425 + 170 + 160 + 1 = 754$  psi

Volume, litres	0.5	1.0	1.5	2.0	2.5	3.0	3.5	3.75	3.85	
Pressure, psi	580	625	635	635	635	645	660	710	750	
Volume, litres	final volume		3.75 L.							
Pressure, psi										



Comments: Packer # normal inflation

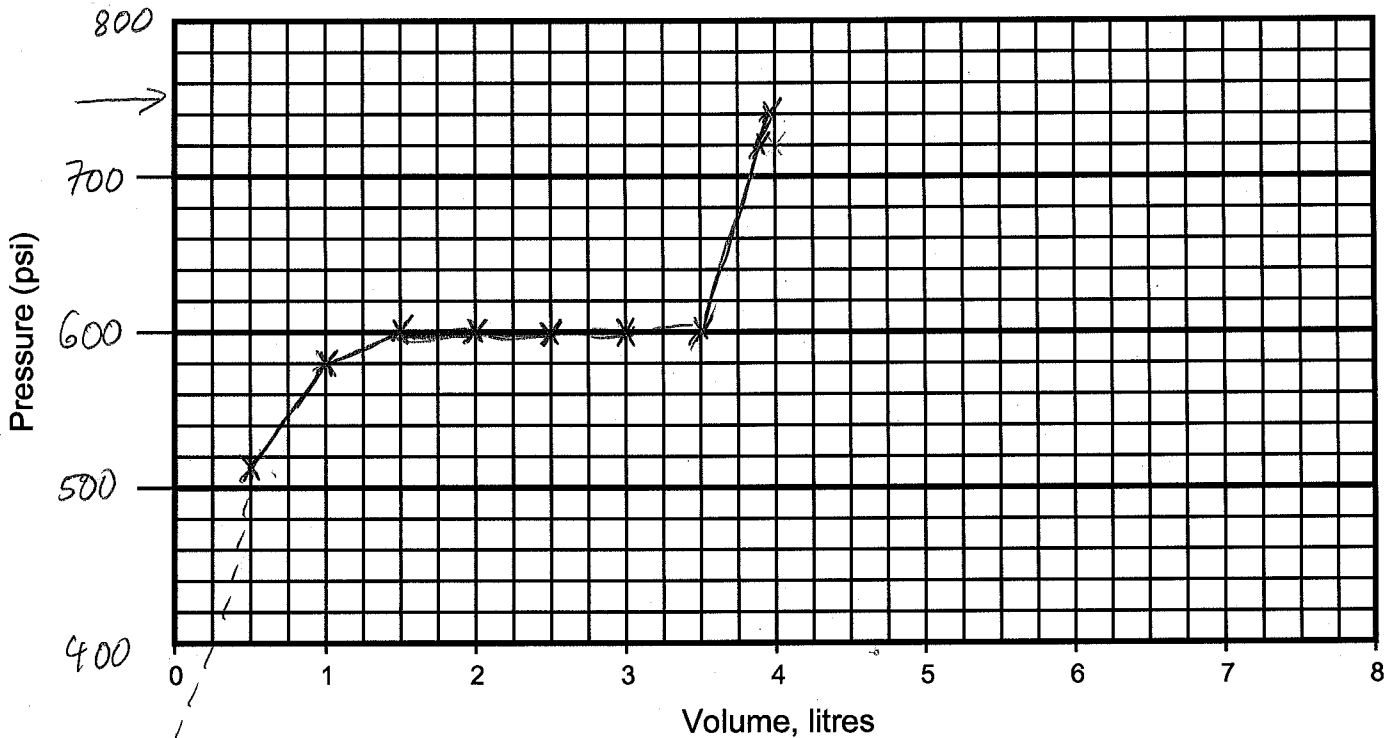
Time - 14:35

# Packer Inflation Record

Project: Minto Project No.: 20022.007.001.10 Well No.: MW09-3  
 Location: Minto North Completed by: CD, JS Date Inflated: 27 Nov 2009  
 Packer No. 12 Serial # 17028 Depth (ft/m): 55 ft Inflation Tool No.: \_\_\_\_\_  
 Packer Valve Pressure, P<sub>V</sub>: 165 psi Final Line Pressure, P<sub>L</sub>: 749 psi Tool Pressure, P<sub>T</sub>: 425 psi  
 Borehole Water Level: 4 (ft/m) = 1 psi (P<sub>W</sub>)

Calculated Packer Element Pressure,  $P_E = P_L + P_W - P_V - P_T = 160$  psi  
 $425 + 165 + 160 - 1 = 749$  psi

Volume, litres	0.5	1.0	1.5	2.0	2.5	3.0	3.5	3.8	3.9	FINAL 375L
Pressure, psi	515	580	600	600	600	600	600	720	740	
Volume, litres										
Pressure, psi										



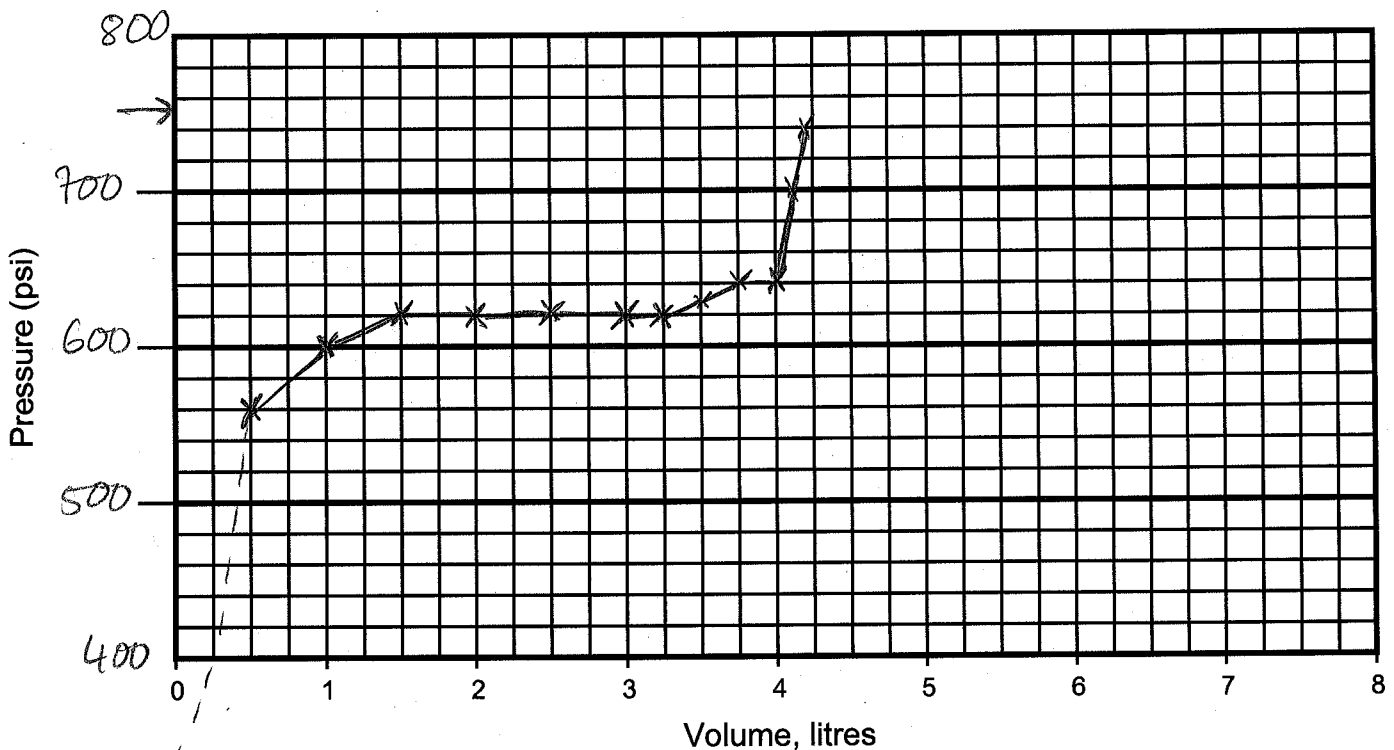
Comments: Packer # Normal inflation. Time - \_\_\_\_\_



# Packer Inflation Record

Project: Minto Project No.: 2CM022-007 Well No.: MW09-3  
 Location: Minto North Completed by: CD, JS Date Inflated: 27 Nov 09  
 Packer No. 16 Serial # 17023 Depth (ft) m): 20 ft Inflation Tool No.: \_\_\_\_\_  
 Packer Valve Pressure, P<sub>V</sub>: 170 psi Final Line Pressure, P<sub>L</sub>: 754 psi Tool Pressure, P<sub>T</sub>: 425 psi  
 Borehole Water Level: 4 (ft/m) = 1 psi (P<sub>W</sub>)  
 Calculated Packer Element Pressure, P<sub>E</sub> = P<sub>L</sub> + P<sub>W</sub> - P<sub>V</sub> - P<sub>T</sub> = 160 psi

Volume, litres	0.5	1.0	1.5	2.0	2.5	3.0	3.25	3.5	3.75	4.0
Pressure, psi	560	600	620	620	620	620	620	630	640	640
Volume, litres	4.1	4.15	Final volume 3.9L							
Pressure, psi	700	740								



Comments: Packer # \_\_\_\_\_

Time - \_\_\_\_\_

On first pumping, pressure rose then suddenly dropped, then rose again. Packer pushing loose rock until it gave way? Otherwise normal inflation.

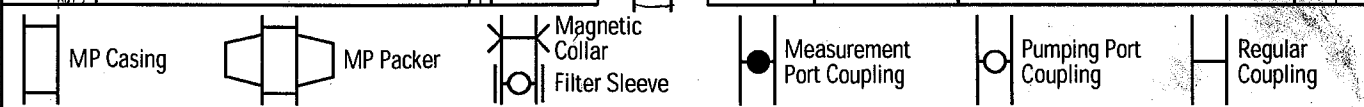
Project: Minto 2CM022.007 WB Ref.: \_\_\_\_\_

Location: Phase 1 confluence Hole No.: MW09-4 Installed by: M. Royle / J. Scib  
C. Dougherty

Hole Depth: 250 FT MP Depth: 250 FT Hole Diameter: HLR Date Installed: Nov 24 '09

Measurement Datum: \_\_\_\_\_ Datum Elevation: \_\_\_\_\_ Date Drawn: Nov 24 '09

Depth,	Geological Description	m ↓ FT	Geologic Log	MP Casing Log	Serial No. Batch No.	Final Packer Pressure/Volume	Comments	Joint	
								Install	Test
5			✓	27					
10									
15			✓	26					
20									
25			✓	25					
30									
35			✓	24					
40									
45			✓	23					
50									
55			✓	22					
60									
65			✓	21					
70									
75			✓	20					
80									
85			✓	19					
90									
95			✓	18					



Project: Minto 2CM022.007.001.100 WB Ref.: \_\_\_\_\_

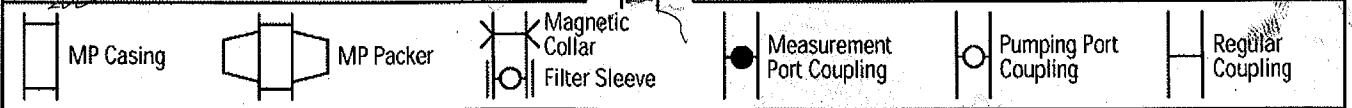
Location: Phase 1 confluence Hole No.: MWD9-4 Installed by: M. Royle / J. Scibel

Hole Depth: 250 FT MP Depth: 250 FT Hole Diameter: HQ Date Installed: Nov 24 '09

Measurement Datum: ground surface Datum Elevation: \_\_\_\_\_ Date Drawn: Nov 24 '09

Depth	Geological Description	Geologic Log	MP Casing Log	Serial No. Batch No.	Final Packer Pressure/Volume	Comments	Joint	
							Install	Test
105		✓	17					
110	mostly diamict (14 ft) or firm frozen clay with ice inclusions	✓	16					
115								
120	note: clayey fine sand (frozen)	✓	15			w/ = 74.52 m - 5 FT stuck after install (30 min)		
125								
130		✓	14					
135	small ice layer at 136.5'	✓	14					
140	firm clay diamict (compacted) - frozen	V <sub>0</sub> = 165 V <sub>r</sub> = 140	13					
145								
150	highly weathered bedrock crumbly, clayey	✓	12					
155	weath. altered bedrock, R2 strength, core jointed	✓ M	11	2798		mag. collar		
160								
165		✓	10	7954				
170		✓	10					
175	strong rock, jointed	✓ M	9	17031 2797		mag collar on bottom of packer		
180								
185		✓	8					
190		✓	7	7953				
195		✓	7					
200								

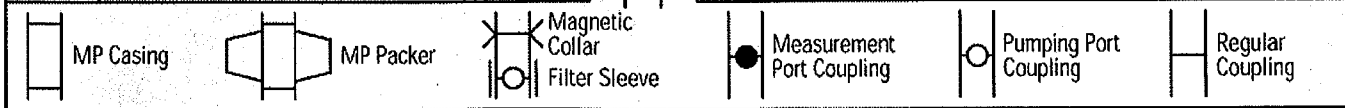
Nov 25  
15:35  
bottom  
2 packers  
inflated  
with  
HQ shoe  
at 160 ft



Project: Minto 2CM022.007 WB Ref.: \_\_\_\_\_  
 Location: Phase 1 confluence Hole No.: MWD9-4 Installed by: M. Royle/J. Scribek/C. Doughty  
 Hole Depth: 250 FT MP Depth: 250 FT Hole Diameter: HR Date Installed: Nov 24 '09  
 Measurement Datum: ground surface Datum Elevation: \_\_\_\_\_ Date Drawn: Nov 24 '09

U.HQ

Depth	Geological Description	Geologic Log	MP Casing Log	Serial No. Batch No.	Final Packer Pressure/Volume	Comments	Joint	
							Install	Test
205	strong rock, jointed	✓	6	17024				
210		1/8" TO 1/4" ASD ✓	5			don't put packer below 205'		
215								
220		✓	4					
225	✓	✓	3	M 2796		mag-collar		
230		✓						
235		✓	0	7952				
240		✓		7952				
245	EDH at 243'	EDH				end cap		
250	EDH at 250'					drill hole w.l. = ?		
						measure before install		
						probed hole = 243.1'		
						shortened orig design by 5' by remains		
						#2 pipe (5ft)		



# Packer Inflation Record

Project: Minto Project No.: 2CM022.007.001 Well No.: MW09-04  
 Location: Phase 1 Confluence Completed by: MR/SS/CD Date Inflated: Nov 25/09  
 Packer No.: 6 Depth (ft/m): 205 Inflation Tool No.: \_\_\_\_\_  
 Packer Valve Pressure, P<sub>V</sub>: 170 psi Final Line Pressure, P<sub>L</sub>: 780 psi Tool Pressure, P<sub>T</sub>: 475 psi  
 Borehole Water Level: ~30 (ft/m) = 15 psi (P<sub>W</sub>)

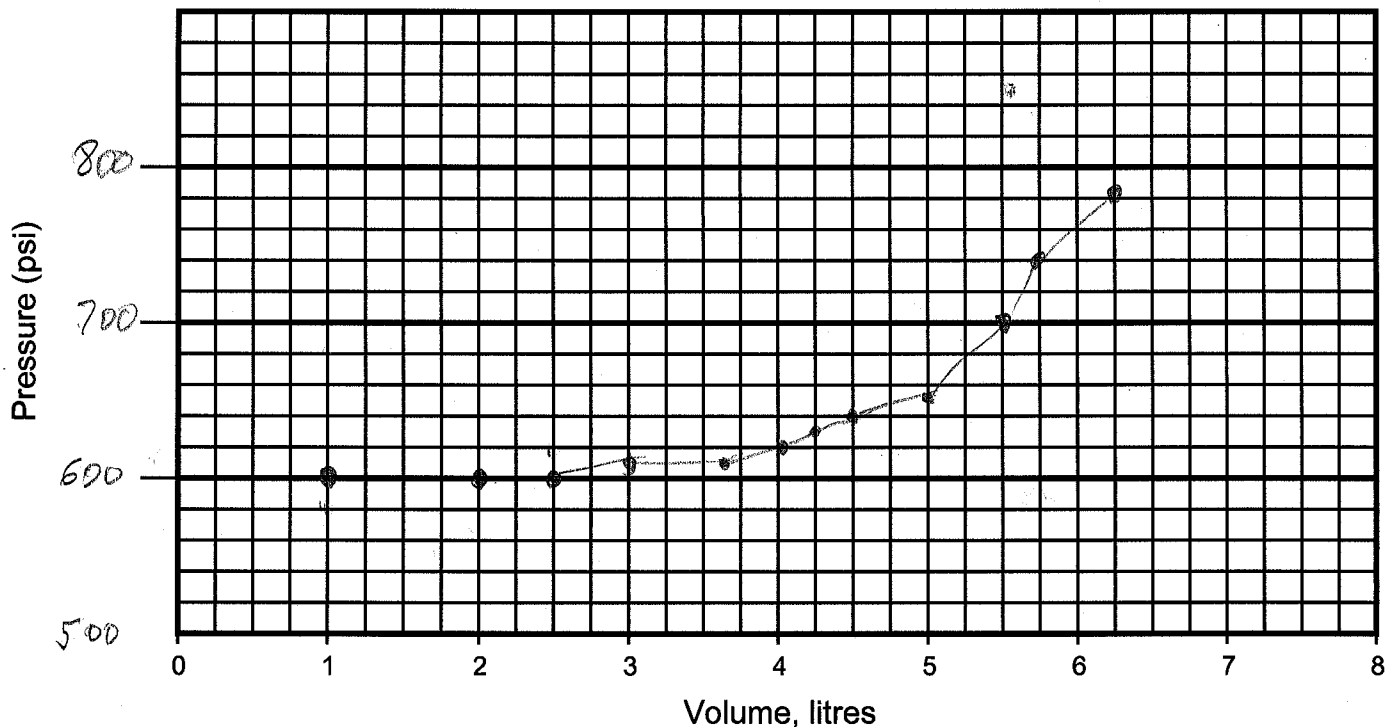
$$P_L = P_V + P_T - P_W + P_E$$

$$\text{Calculated Packer Element Pressure, } P_E = P_L + P_W - P_V - P_T = 150 \text{ psi}$$

$$P_L = +150 - 15 + 170 + 475 = 780$$

$$+15 - 170 - 475$$

Volume, litres	1	2.0	2.5	3.0	3.5	4.0	4.25	4.5	5.0	5.5
Pressure, psi	600	600	600	610	610	620	630	640	650	700
Volume, litres	5.75	6.0		Final	575 <sub>L</sub>					
Pressure, psi	740	780								



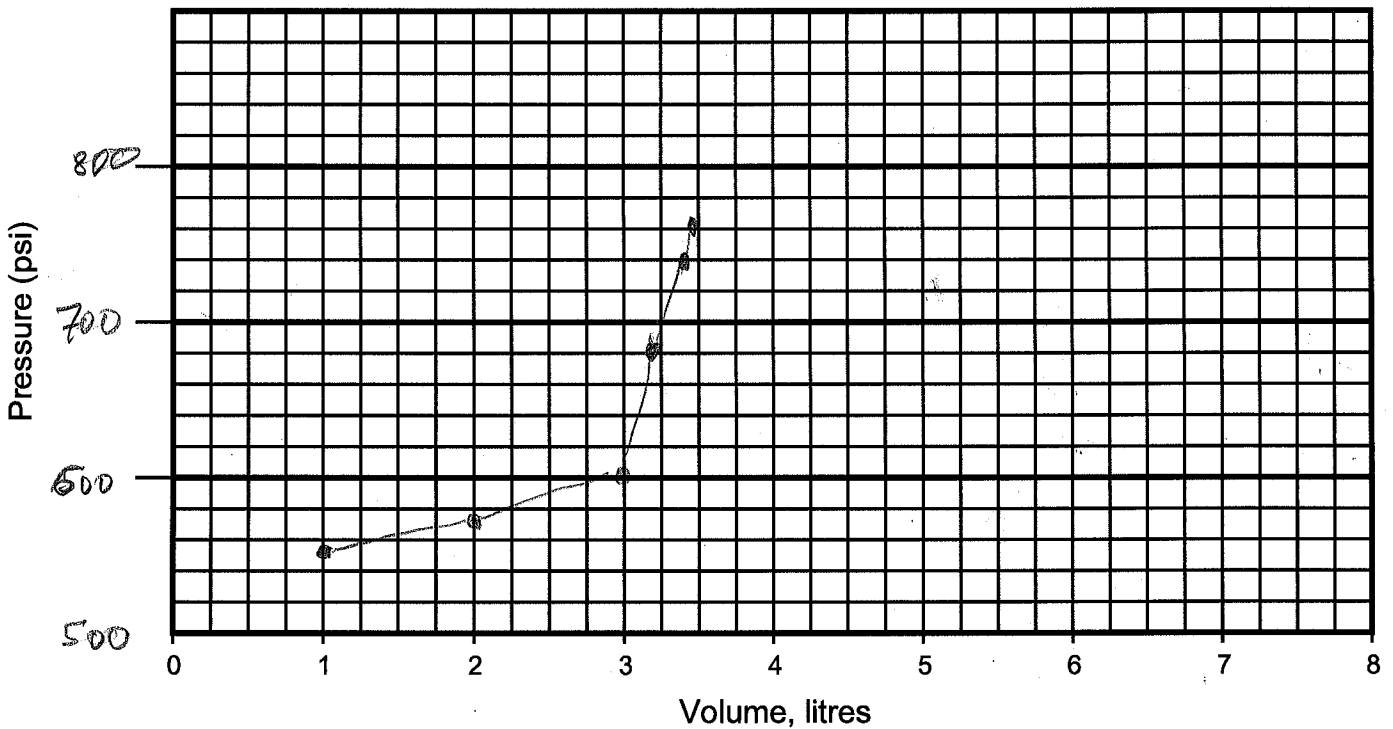
Comments: Packer #

Time - \_\_\_\_\_

# Packer Inflation Record

Project: Minto Project No.: 2CM022.007.00 Well No.: MWD09-04  
 Location: Phase 1 Confluence Completed by: JS/MR Date Inflated: Nov 25 '09  
 Packer No. 9 Depth (ft/m): 180 Inflation Tool No.: \_\_\_\_\_  
 Packer Valve Pressure, P<sub>V</sub>: 170 psi Final Line Pressure, P<sub>L</sub>: 780 psi Tool Pressure, P<sub>T</sub>: 475 psi  
 Borehole Water Level: 25 (ft/m) = 15 psi (P<sub>W</sub>)  
 Calculated Packer Element Pressure, P<sub>E</sub> = P<sub>L</sub> + P<sub>W</sub> - P<sub>V</sub> - P<sub>T</sub> = 150 psi

Volume, litres	1.0	2.0	3.0	3.2	3.25	3.3		Final Vol = 3.15 L
Pressure, psi	550	570	600	690	740	760		
Volume, litres								
Pressure, psi								

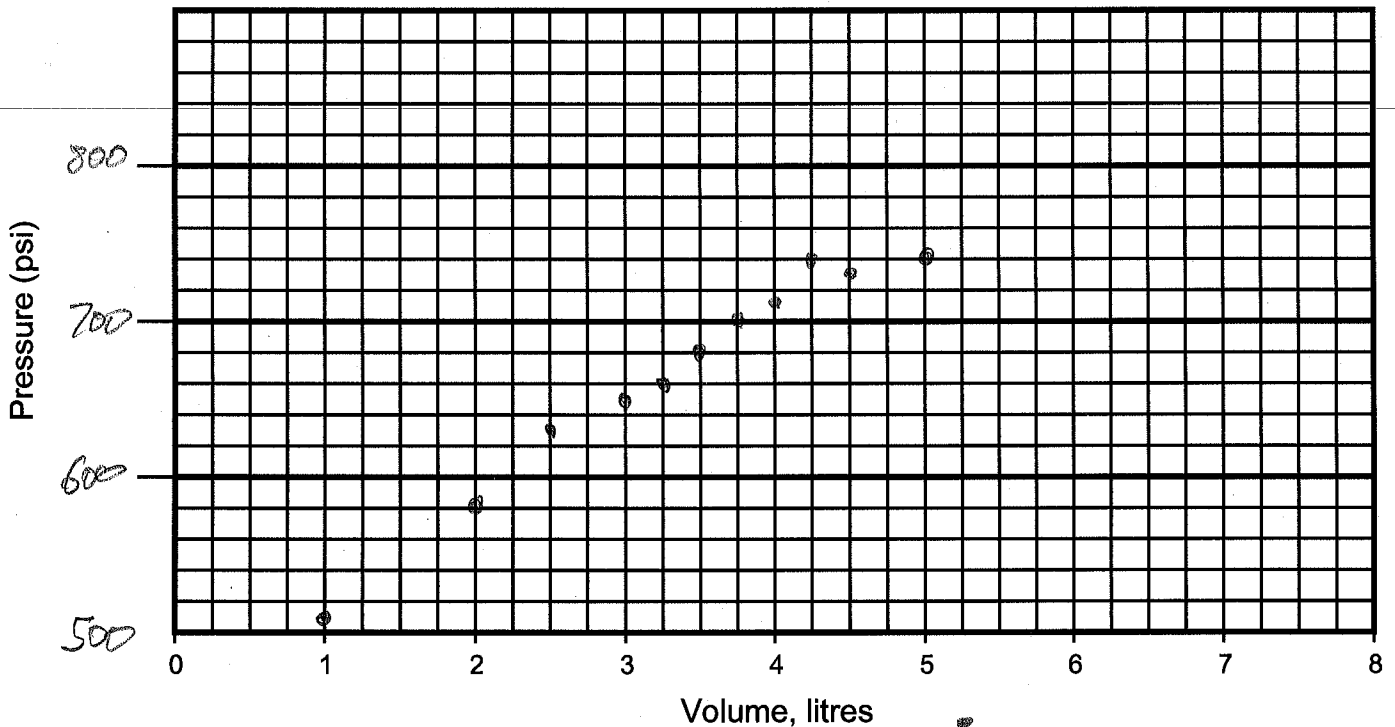


Comments: Packer # Time - \_\_\_\_\_

# Packer Inflation Record

Project: Minto Project No.: 2CM022.007.001 Well No.: MW09-4  
 Location: Phase 1 Confluence Completed by: JS Date Inflated: Nov 25 '09  
 Packer No. 13 Depth (ft/m): 145 Inflation Tool No.: \_\_\_\_\_  
 Packer Valve Pressure, P<sub>v</sub>: 165 psi Final Line Pressure, P<sub>L</sub>: 775 psi Tool Pressure, P<sub>T</sub>: 475 psi  
 Borehole Water Level: \_\_\_\_\_ (ft/m) = \_\_\_\_\_ psi (P<sub>w</sub>)  
 Calculated Packer Element Pressure, P<sub>E</sub> = P<sub>L</sub> + P<sub>w</sub> - P<sub>v</sub> - P<sub>T</sub> = 150 psi

Volume, litres	1.0	2.0	2.5	3.0	3.25	3.5	3.75	4.0	4.25	4.5
Pressure, psi	510	580	630	650	660	680	700	710	740	730
Volume, litres	5.0	5.15		5 L final						
Pressure, psi	740	420								



Comments: Packer #

Time - \_\_\_\_\_

**Appendix C**  
**Preliminary Pressure Profiles**















**Appendix D**  
**Sampling Records**







# Groundwater Sampling Field Data Sheet

Well No.: MW09-1  
Date: 30 Nov 09

Zones sampled: 4 #  
Drillhole angle: 90 degrees  
Start Time: 12:05  
End Time: 19:50

Client: MINTO  
Job No.: 2CM022-007,001.10  
Location: WEST PIT  
Weather: COLD + SUNNY  
Operator(s): CD + RS

Zone No.	Sample Bottle Label	Port Position From Log (m)	Port Position From Cable (m)	Run No.	Surface Function Tests (probe in flushing collar)						Position Sampler	Sample Collection Checks (probe located at sampling zone in MP casing)							Volume Retrieved		Comments									
					Shoe Out	Close Valve	Check Vacuum	Open Valve	Evacuate Container	Close Valve		Locate Port ( ) Arm Out ( ) Land Probe ( )	Pressure in MP (psi)	Shoe Out	Zone Pressure (psi)	Open Valve	Zone Pressure (psi)	Time to Fill (min)	Close Valve	Shoe In		Pressure in MP (psi)	Filtered & Preserved (mL)	Not Filtered / Not Preserved (mL)						
1	MW09-1-1	43.2	43.6	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	one tiny drop in bottle. → Void with air?
2	MW09-1-2	32.5	32.1	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Dissolved Metals HNO <sub>3</sub> + Nutrients H <sub>2</sub> SO <sub>4</sub>
2	MW09-1-2	32.5	32.1	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Total metals HNO <sub>3</sub>
2	MW09-1-2	32.5	32.1	3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Routine Parameters.
3	MW09-1-3	24.9	24.0	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Dissolved, total, 1/2 Nutrients.
3	MW09-1-3	24.9	23.8	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1/2 Nutrients, 1/2 RP
3	MW09-1-3	24.9	23.8	3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1/2 RP, 1/2 RP for zone 4*
4*	MW09-1-4	24.9	23.6	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1/2 RP, DM
4*	MW09-1-4	24.9	23.5	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	TM, Nutrients.

Additional Comments: (pH, Turbidity, S.C., etc.)

\* zone 4 is a duplicate of zone 3 for QA/QC





# Groundwater Sampling Field Data Sheet

Well No.: MW09-2  
Date: 2 DEC 09

Zones sampled: 3  
Drillhole angle: 90 degrees  
Start Time: 13:10  
End Time: 16:30

Zone 1 51.8  
Zone 2 47.2

$P_{atm} = 13.12 \text{ psi}$

Client: MINTO  
Job No.: ZCM022.007.001-10  
Location: LOWER TAILINGS  
Weather: COLD, WINDY & SUNNY  
Operator(s): CD, GH

Zone No.	Sample Bottle Label	Port Position From Log (m)	Port Position From Cable (m)	Run No.	Surface Function Tests (probe in flushing collar)						Position Sampler	Sample Collection Checks (probe located at sampling zone in MP casing)							Volume Retrieved		Comments							
					Shoe Out	Close Valve	Check Vacuum	Open Valve	Evacuate Container	Close Valve		Locate Port ( )	Arm Out ( )	Land Probe ( )	Pressure in MP (psi)	Shoe Out	Zone Pressure (psi)	Open Valve	Zone Pressure (psi)	Time to Fill (min)		Close Valve	Shoe In	Pressure in MP (psi)	Filtered & Preserved (mL)	Not Filtered / Not Preserved (mL)		
1	MW09-2-1	51.8	49.8	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Temp < 0.1°C Sample had antifreeze - leak.
1	MW09-2-1	51.8	49.5	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	N, TM, DM - no antifreeze
1	MW09-2-1	51.8	49.4	3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	RP	
3	MW09-2-3	51.8	49.4	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	N, TM, DM	
3	MW09-2-3	51.8	49.0	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	RP	
2	MW09-2-2	47.2	44.3	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	NO FLOW → ICE? T ≈ 0.2°C	

Additional Comments: (pH, Turbidity, S.C., etc.)

MW09-2-3 is a duplicate of MW09-2-1

Well Development / Purging Record

1 DEC 2009

Well: MW09-3		Well Inner Diameter: MP38 cm					
Total Depth: 50.45 mbtc		Static Water Level: 3.52m with ports open, mbtc		Static Well Volume: ~476 inside MPwell prior to dev. Litres			
Date/Time	Volume Purged (Litres)	pH	EC (µS/cm)	T (C)	Eh (mv)	dO (mg/l)	Comments
11:22	25	N/A	N/A	N/A	—	—	Antifreeze solution
11:35	50	9.08	1.65	5.5	—	—	Antifreeze solution.
11:40	75	8.80	0.57	3.1	—	—	cloudy-brown
11:46	100	8.38	0.34	2.4	—	—	cloudy-brown
11:51	125	8.00	0.30	2.2	—	—	cloudy-brown
11:55	150	7.97	0.26	1.7	—	—	cloudy-brown, clear in small container.
11:59	175	7.93	0.23	2.0	—	—	clear in small container
12:03	200	7.82	0.23	1.7	—	—	" "
12:07	225	7.85	0.22	1.7	—	—	" "
12:11	250	7.81	0.21	1.7	—	—	" "
12:16	275	7.79	0.21	1.7	—	—	" "
							WL 3.74m after purging.
							WL 4.08m from TOC after ports closed

N.B. mbtc - meters below top of casing

EC is a little off but abs. values not important for development purposes.

# MP Groundwater Sampling

## Field Data Sheet

 Well No.: MW09-3  
 Date: 1 DEC 2009

 Zones sampled: 4\*  
 Drillhole angle: 9.0 degrees  
 Start Time: 13:10  
 End Time: 16:45

 Atmospheric Pressure = 13.06 psi

 Client: MINTO  
 Job No.: ZCM022,007.001.10  
 Location: MINTO NORTH  
 Weather: SUNNY + COLD  
 Operator(s): CD, RS, GH

Zone No.	Sample Bottle Label	Port Position From Log (m)	Port Position From Cable (m)	Run No.	Surface Function Tests (probe in flushing collar)						Position Sampler	Sample Collection Checks (probe located at sampling zone in MP casing)							Volume Retrieved		Comments				
					Shoe Out	Close Valve	Check Vacuum	Open Valve	Evacuate Container	Close Valve		Locate Port ( ) Arm Out ( ) Land Probe ( )	Pressure in MP (psi)	Shoe Out	Zone Pressure (psi)	Open Valve	Zone Pressure (psi)	Time to Fill (min)	Close Valve	Shoe In		Pressure in MP (psi)	Filtered & Preserved (mL)	Not Filtered / Not Preserved (mL)	
1	MW09-3-1	37.6	37.4	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	63.03	✓	64.86	✓	62.85	6	✓	✓	63.08	400		DM, TM, Nutrients <sup>th level</sup>
1	MW09-3-1	37.6	37.3	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	63.03	✓	64.38	✓	62.73	8	✓	✓	63.03	400		RP brown colour
2	MW09-3-2	23.8	23.3	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	43.36	✓	42.61	✓	41.87	13	✓	✓	43.37	400		DM, TM, N, clear
2	MW09-3-2	23.8	23.2	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	43.33	✓	42.48	✓	41.88	13	✓	✓	43.35	400		RP clear. T=0.32
4*	MW09-3-4*	23.8	23.1	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	43.30	✓	42.54	✓	41.87	13	✓	✓	43.31	400		DM, TM, N clear
4*	MW09-3-4*	23.8	23.0	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	43.28	✓	42.53	✓	41.88	13	✓	✓	43.28	400		RP clear
3	MW09-3-3	10.1	10.2	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	23.61	✓	23.05	✓	23.05	4	✓	✓	23.60	400		DM, TM, N clear
3	MW09-3-3	10.1	10.2	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	23.60	✓	23.08	✓	23.05	3.5	✓	✓	23.59	400		RP clear

Additional Comments: (pH, Turbidity, S.C., etc.)

\* MW09-3-4 is a duplicate of MW09-3-2

**Appendix E**  
**MP Monitoring Well History Log**

Appendix E: Sample MP Monitoring Well History Log

Monitoring Well	Date	Comments	Pumping Port Status
<b>MW09-1</b>	Nov28, 09 Nov 29, 09 Nov 30, 09	- installed, pressure profile - developed - sampled zones 1 to 4	- all closed
<b>MW09-2</b>	Nov 26, 09 Dec 1, 09 Dec 2, 09	- installed - pressure profile and developed - sampled zones 1 to 4	- all closed
<b>MW09-3</b>	Nov 27, 09 Dec 2, 09	- installed, pressure profile - developed and sampled zones 1 to 4	- all closed
<b>MW09-4</b>	Nov 24, 09	- installed	- all closed





# Minto Mine Groundwater Monitoring System Sampling Report

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*Prepared for*

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*Prepared by*

*Project Reference Number  
SRK 2CM022.007*

**July 2010**

**Minto Mine**  
**Groundwater Monitoring System**  
**Sampling Report**

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**SRK Project Number 2CM022.007.0001.03**

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# 1 Introduction

This report provides monitoring results collected in March 2010 from the multilevel monitoring wells at the Minto Mine, Yukon. The purpose of the monitoring system is to improve the understanding of hydrogeological conditions across the site and provide background water levels and hydrogeochemistry for environmental monitoring of the site.

Figure 1 shows the general layout of the mine workings and all monitoring locations on the site.

Drillhole logs, methodologies and MP wells installation details are described in “Minto Mine, Groundwater Monitoring System Installation Report”, SRK Consulting, Feb.2010.

## 2 Monitoring

### 2.1 Pressure Monitoring

Pressure profiles were carried out in wells MW09-1 and MW09-3. It was not possible to access the measurement ports in MW09-2 as the pipe had been sheared off by the ground movement, nor in MW09-04 as a large boulder had bent the pipe at shallow depth, preventing the probe to be lowered.

**Table 1: Pressure Measurements in MP Wells**

Well ID	Zone #	Port Depth	Initial Pressure Reading*		Pressure Round #1*		Pressure Round#2*	
		Mbgs*	psi	m	psi	m	psi	m
MW09-01	1	43.19	18.34	39.40	12.85	43.38	12.86	43.10
	2	32.52	37.10	15.54	18.95	28.42	13.48	32.00
	3	24.90	26.28	15.53	14.76	23.75	30.72	12.25
MW09-02	1	51.82	-	-	80.89	4.26	-	-
	2	47.24	-	-	74.39	4.26	-	-
MW09-03	1	37.95	66.29	0.36	67.13	-0.07	65.29	0.89
	2	24.24	42.70	3.24	42.75	3.36	46.76	0.21
	3	10.52	23.16	3.26	23.13	3.44	22.54	3.52
MW09-04	1	68.58	-	-	-	-	-	-
	2	54.86	-	-	-	-	-	-
	3	47.24	-	-	-	-	-	-

**NOTE:**

mbgs. Meter Below Ground Surface

Initial Pressure reading: November 27<sup>th</sup> and 28<sup>th</sup> 2009

Round #1: November 30<sup>th</sup> and December 1<sup>st</sup> 2009

Round#2: March 29<sup>th</sup> and 30<sup>th</sup> 2010

Figure 2 and Figure 3 show piezometric levels measured in each monitoring zone, plotted as “equivalent depth to water” for each time of measurements. “Equivalent depth to water” refers to the depth the water would be observed in an open standpipe if screened across the MP zone, and calculated by adding the pressure head (height of water column calculated from the zone pressure measured) to the depth of the measurement port where the pressure was measured.

Plots also show an “atmospheric line”, which indicates where the pressure head equals zero (i.e., piezometric head equals elevation head). This condition will occur if the zone is unsaturated (dry), and is analogous to an open borehole where the water level is at, or below, the measurement zone. Therefore, unsaturated zones will plot along the atmospheric line while saturated zones will plot above this line.

## 2.2 Development and Sampling

Monitoring wells were sampled using equipment consisting of a “pressure probe/sampler” with stainless steel sample collection bottles to the wireline pressure measurement tool. A vacuum is induced in the bottles so that when the tool is connected to a measurement port and the valve to the sample bottles is opened, water flows from outside the casing into the bottles due to the pressure difference. Two 250ml sample bottles were used in tandem, collecting approximately 500mL with each run. The sample bottles were thoroughly rinsed with distilled water between sampling zones, and with nitric acid at the start of each day. Geochemical analyses were conducted by MEL Laboratory.

**Table 2: List of Groundwater Sampling Locations**

Well ID	Zone #	Port Depth	Sample ID	Sampled	Comments
		m		Yes/No	
MW09-01	1	43.19	Dry	No	-
	2	32.52	Dry	No	
	3	24.90	MW09-1-3	Yes	
MW09-02	1	51.82	-	No	Well broken
	2	47.24	-	No	
MW09-03	1	37.95	MW09-3-1	Yes	One Duplicate sample MW09-03-04
	2	24.24	MW09-3-2	Yes	
	3	10.52	MW09-3-3	Yes	
MW09-04	1	68.58	-	No	-
	2	54.86	-	No	
	3	47.24	-	No	

Water samples were taken from:

- MW09-01 in Zone 3. Zone 1 and 2 did not appear to have any water flow; and
- MW09-03 in all zones.

One duplicate sample of MW09-03 in zone 3 and two blanks were taken and labelled as if it were an additional zone, as noted on the sampling records, which are included in Appendix A.

## 2.3 Sampling Results

Table 3 shows analyses of the laboratory results using blanks and duplicate sample. QA/QC of the groundwater laboratory results are summarized below:

- Ionic balance range between 106 and 116% which is considered reasonable;
- In both blank samples, parameters analyzed in laboratory remain below or close to the limit of detection. Concentration levels that have been measured above the limit of detection have very low concentrations and considered insignificant in terms of potential external contamination;
- There are no significant variations between measured concentrations in the MW09-03 (zone 3) sample and its duplicate; both of them have identical chemistry. The relative difference between the two samples is for most of the parameters less than 20%. Eleven parameters out of 93 show difference higher than 20%, but all within a very close range of the limit of detection which increase measurement sensitivity.

Results of the groundwater sampling are shown in Table 4.

Table 3: QA/QC – Blanks and Duplicate Sample

	Unit	DL	MW09-03	MW09-03 DUP	Relative diff%
Zone#	-		3	3	-
Sample Label			MW09-3-3	MW09-3-4	-
Sample Id	-	-	3305939	3305940	-
Sample Location	-	-	Minto North	Minto North	-
Date Sampled	m/dd/yyyy	-	3/29/2010	3/29/2010	-
Sample Depth	m	0.1	10.5	-	-
Completed Date	m/dd/yyyy	-	4/12/2010	4/12/2010	-
Matrix	-	-	Water	Water	-
<b>Physical Tests</b>					
pH @25°C	(1)	-	7.84	7.79	0.6%
Electrical Conductivity	µS/cm	1	158	161	1.9%
Hardness as CaCO3	mg/L	5	69	71	2.9%
T-Alkalinity as CaCO3	mg/L	5	63	67	6.2%
Turbidity	NTU	0.1	0.3	0.7	80.0%
Total Suspended Solids	mg/L	1	4	4	0.0%
Total Dissolved Solids	mg/L	5	114	112	1.8%
Colour	CU	5	5	5	0.0%
<b>Major Anions and Cations</b>					
Carbonate	mg/L	6	6	6	0.0%
Calcium	mg/L	0.1	23.4	24.2	3.4%
Magnesium	mg/L	0.1	2.4	2.6	8.0%
Sodium	mg/L	0.1	2.6	2.7	3.8%
Phosphorus	mg/L	0.01	0.01	0.01	0.0%
Potassium	mg/L	0.1	2.3	2.2	4.4%
Silicon	mg/L	0.05	3.85	3.98	3.3%
Bicarbonate	mg/L	5	80	80	0.0%
Hydroxide	mg/L	5	5	5	0.0%
Ionic Balance	%	-	116	111	4.4%
<b>Anions and Nutrients</b>					
Ammonium - N	mg/L	0.05	0.05	0.05	0.0%
Total Kjeldahl Nitrogen	mg/L	0.06	0.06	0.06	0.0%
Total Phosphorus	mg/L	0.05	0.05	0.05	0.0%
Orthophosphate-P	mg/L	0.01	0.06	0.06	0.0%
Nitrate and Nitrite - N	mg/L	0.01	0.47	0.48	2.1%
Chloride	mg/L	0.02	0.61	0.61	0.0%
Sulfate (SO4)	mg/L	0.6	10	10	0.0%
<b>Dissolved Metals</b>					
Aluminum	mg/L	0.005	0.005	0.013	88.9%
Antimony	mg/L	0.0002	0.0009	0.0012	28.6%
Arsenic	mg/L	0.0002	0.0002	0.0002	0.0%
Barium	mg/L	0.001	0.013	0.01	26.1%
Beryllium	mg/L	0.00004	0.00004	0.00004	0.0%
Bismuth	mg/L	0.001	0.001	0.001	0.0%
Boron	mg/L	0.004	0.04	0.042	4.9%
Cadmium	mg/L	0.00001	0.00002	0.00001	66.7%
Chromium	mg/L	0.0004	0.0004	0.0004	0.0%
Cobalt	mg/L	0.00002	0.00009	0.00008	11.8%
Copper	mg/L	0.001	0.005	0.004	22.2%
Iron	mg/L	0.01	0.01	0.03	100.0%
Lead	mg/L	0.0001	0.0007	0.0002	111.1%
Lithium	mg/L	0.001	0.001	0.001	0.0%
Manganese	mg/L	0.0002	0.0129	0.0087	38.9%
Mercury	ug/L	0.01	0.01	0.01	0.0%
Molybdenum	mg/L	0.0001	0.0064	0.0049	26.5%
Nickel	mg/L	0.001	0.001	0.001	0.0%
Selenium	mg/L	0.0006	0.0006	0.0006	0.0%
Silver	mg/L	0.00001	0.00001	0.00001	0.0%
Strontium	mg/L	0.001	0.125	0.12	4.1%
Sulfur	mg/L	0.2	3.4	3.5	2.9%
Tellurium	mg/L	0.0001	0.0001	0.0001	0.0%
Thallium	mg/L	0.00001	0.00001	0.00001	0.0%
Thorium	mg/L	0.0004	0.0004	0.0004	0.0%
Tin	mg/L	0.0001	0.0001	0.0001	0.0%
Titanium	mg/L	0.01	0.01	0.01	0.0%
Uranium	mg/L	0.0004	0.0004	0.0004	0.0%
Vanadium	mg/L	0.0001	0.0002	0.0004	66.7%
Zinc	mg/L	0.001	0.005	0.004	22.2%
Zirconium	mg/L	0.0001	0.0001	0.0001	0.0%

Table 3: QA/QC – Blanks and Duplicate Sample

	Unit	DL	MW09-03	MW09-03 DUP	Relative diff%
Zone#	-		3	3	-
Sample Label			MW09-3-3	MW09-3-4	-
Sample Id	-	-	3305939	3305940	-
Sample Location	-	-	Minto North	Minto North	-
Date Sampled	m/dd/yyyy	-	3/29/2010	3/29/2010	-
Sample Depth	m	0.1	10.5	-	-
Completed Date	m/dd/yyyy	-	4/12/2010	4/12/2010	-
Matrix	-	-	Water	Water	-
<b>Total Metals</b>					
Aluminum	mg/L	0.005	0.01	0.014	33.3%
Antimony	mg/L	0.0002	0.0002	0.0003	40.0%
Arsenic	mg/L	0.0002	0.0002	0.0002	0.0%
Barium	mg/L	0.001	0.013	0.01	26.1%
Beryllium	mg/L	0.00004	0.00004	0.00004	0.0%
Bismuth	mg/L	0.001	0.001	0.001	0.0%
Boron	mg/L	0.004	0.034	0.034	0.0%
Cadmium	mg/L	0.00001	0.00001	0.00006	142.9%
Calcium	mg/L	0.05	24.9	24.9	0.0%
Chromium	mg/L	0.0004	0.0004	0.0006	40.0%
Cobalt	mg/L	0.00002	0.00007	0.00006	15.4%
Copper	mg/L	0.001	0.004	0.004	0.0%
Iron	mg/L	0.01	0.027	0.047	54.1%
Lead	mg/L	0.0001	0.0002	0.0002	0.0%
Lithium	mg/L	0.001	0.001	0.001	0.0%
Magnesium	mg/L	0.05	2.62	2.63	0.4%
Manganese	mg/L	0.0002	0.0132	0.009	37.8%
Manganese	mg/L	0.005	0.007	0.005	33.3%
Mercury	ug/L	0.01	0.01	0.01	0.0%
Molybdenum	mg/L	0.0001	0.0065	0.0051	24.1%
Nickel	mg/L	0.001	0.001	0.001	0.0%
Potassium	mg/L	0.1	2.1	1.9	10.0%
Selenium	mg/L	0.0006	0.0006	0.0006	0.0%
Silicon	mg/L	0.05	4.4	4.39	0.2%
Silver	mg/L	0.00001	0.00004	0.00003	28.6%
Sodium	mg/L	0.02	3.08	3.07	0.3%
Strontium	mg/L	0.001	0.126	0.127	0.8%
Sulfur	mg/L	0.1	3.4	3.4	0.0%
Tellurium	mg/L	0.0001	0.0001	0.0001	0.0%
Thallium	mg/L	0.00001	0.00001	0.00001	0.0%
Thorium	mg/L	0.0004	0.0004	0.0004	0.0%
Tin	mg/L	0.0001	0.0001	0.0001	0.0%
Titanium	mg/L	0.001	0.001	0.001	0.0%
Uranium	mg/L	0.0004	0.0004	0.0004	0.0%
Vanadium	mg/L	0.0001	0.0003	0.0004	28.6%
Zinc	mg/L	0.001	0.01	0.01	0.0%
Zirconium	mg/L	0.0001	0.0001	0.0001	0.0%



**Table 3: QA/QC – Blanks and Duplicate Sample**

	Unit	DL	Blank	Blank
<b>Zone#</b>	-		-	-
<b>Sample Label</b>			MW09-1-5	MW09-04-04
<b>Sample Id</b>	-	-	3305935	3305936
<b>Sample Location</b>	-	-	West Pit	Camp
<b>Date Sampled</b>	m/dd/yyyy	-	3/30/2010	3/29/2010
<b>Sample Depth</b>	m	0.1	-	-
<b>Completed Date</b>	m/dd/yyyy		4/12/2010	4/12/2010
<b>Matrix</b>	-	-	Water	Water
<b>Physical Tests</b>				
pH @25°C	(1)	-	6.46	6.15
Electrical Conductivity	µS/cm	1	2	1
Hardness as CaCO3	mg/L	5	<5	<5
T-Alkalinity as CaCO3	mg/L	5	<5	<5
Turbidity	NTU	0.1	0.4	0.1
Total Suspended Solids	mg/L	1	<3	<3
Total Dissolved Solids	mg/L	5	32	12
Colour	CU	5	<5	<5
<b>Major Anions and Cations</b>				
Carbonate	mg/L	6	<6	<6
Calcium	mg/L	0.1	<0.1	<0.1
Magnesium	mg/L	0.1	<0.1	<0.1
Sodium	mg/L	0.1	<0.1	<0.1
Phosphorus	mg/L	0.01	<0.01	<0.01
Potassium	mg/L	0.1	0.7	0.6
Silicon	mg/L	0.05	3.38	<0.05
Bicarbonate	mg/L	5	<5	<5
Hydroxide	mg/L	5	<5	<5
Ionic Balance	%	-	-	-
<b>Anions and Nutrients</b>				
Ammonium - N	mg/L	0.05	<0.05	<0.05
Total Kjeldahl Nitrogen	mg/L	0.06	<0.06	<0.06
Total Phosphorus	mg/L	0.05	<0.05	<0.05
Orthophosphate-P	mg/L	0.01	0.06	<0.01
Nitrate and Nitrite - N	mg/L	0.01	0.02	<0.01
Chloride	mg/L	0.02	0.24	<0.02
Sulfate (SO4)	mg/L	0.6	<0.6	<0.6
<b>Dissolved Metals</b>				
Aluminum	mg/L	0.005	<0.005	<0.005
Antimony	mg/L	0.0002	0.0007	0.0006
Arsenic	mg/L	0.0002	<0.0002	<0.0002
Barium	mg/L	0.001	<0.001	<0.001
Beryllium	mg/L	0.00004	<0.00004	<0.00004
Bismuth	mg/L	0.001	<0.001	<0.001
Boron	mg/L	0.004	0.007	<0.004
Cadmium	mg/L	0.00001	0.00002	<0.00001
Chromium	mg/L	0.0004	<0.0004	<0.0004
Cobalt	mg/L	0.00002	0.00004	0.00002
Copper	mg/L	0.001	0.001	<0.001
Iron	mg/L	0.01	<0.01	<0.01
Lead	mg/L	0.0001	0.0001	0.0002
Lithium	mg/L	0.001	<0.001	<0.001
Manganese	mg/L	0.0002	0.0003	<0.0002
Mercury	ug/L	0.01	<0.01	<0.01
Molybdenum	mg/L	0.0001	<0.0001	<0.0001
Nickel	mg/L	0.001	<0.001	<0.001
Selenium	mg/L	0.0006	<0.0006	<0.0006
Silver	mg/L	0.00001	<0.00001	<0.00001
Strontium	mg/L	0.001	<0.001	<0.001
Sulfur	mg/L	0.2	<0.2	<0.2
Tellurium	mg/L	0.0001	<0.0001	<0.0001
Thallium	mg/L	0.00001	<0.00001	<0.00001
Thorium	mg/L	0.0004	<0.0004	<0.0004
Tin	mg/L	0.0001	<0.0001	<0.0001
Titanium	mg/L	0.01	<0.01	<0.01
Uranium	mg/L	0.0004	<0.0004	<0.0004
Vanadium	mg/L	0.0001	<0.0001	<0.0001
Zinc	mg/L	0.001	0.004	0.004
Zirconium	mg/L	0.0001	<0.0001	<0.0001

**Table 3: QA/QC – Blanks and Duplicate Sample**

	Unit	DL	Blank	Blank
Zone#	-		-	-
Sample Label			MW09-1-5	MW09-04-04
Sample Id	-	-	3305935	3305936
Sample Location	-	-	West Pit	Camp
Date Sampled	m/dd/yyyy	-	3/30/2010	3/29/2010
Sample Depth	m	0.1	-	-
Completed Date	m/dd/yyyy		4/12/2010	4/12/2010
Matrix	-	-	Water	Water
<b>Total Metals</b>				
Aluminum	mg/L	0.005	<0.005	<0.005
Antimony	mg/L	0.0002	<0.0002	<0.0002
Arsenic	mg/L	0.0002	<0.0002	<0.0002
Barium	mg/L	0.001	<0.001	<0.001
Beryllium	mg/L	0.00004	<0.00004	<0.00004
Bismuth	mg/L	0.001	<0.001	<0.001
Boron	mg/L	0.004	0.016	0.01
Cadmium	mg/L	0.00001	<0.00001	<0.00001
Calcium	mg/L	0.05	<0.05	<0.05
Chromium	mg/L	0.0004	<0.0004	<0.0004
Cobalt	mg/L	0.00002	<0.00002	<0.00002
Copper	mg/L	0.001	<0.001	<0.001
Iron	mg/L	0.01	0.026	<0.01
Lead	mg/L	0.0001	0.0001	<0.0001
Lithium	mg/L	0.001	<0.001	<0.001
Magnesium	mg/L	0.05	<0.05	<0.05
Manganese	mg/L	0.0002	0.0002	<0.0002
Manganese	mg/L	0.005	<0.005	<0.005
Mercury	ug/L	0.01	<0.01	<0.01
Molybdenum	mg/L	0.0001	<0.0001	<0.0001
Nickel	mg/L	0.001	<0.001	<0.001
Potassium	mg/L	0.1	0.1	<0.1
Selenium	mg/L	0.0006	<0.0006	<0.0006
Silicon	mg/L	0.05	3.7	<0.05
Silver	mg/L	0.00001	<0.00001	<0.00001
Sodium	mg/L	0.02	0.13	0.3
Strontium	mg/L	0.001	<0.001	0.001
Sulfur	mg/L	0.1	<0.1	<0.1
Tellurium	mg/L	0.0001	<0.0001	<0.0001
Thallium	mg/L	0.00001	<0.00001	<0.00001
Thorium	mg/L	0.0004	<0.0004	<0.0004
Tin	mg/L	0.0001	<0.0001	<0.0001
Titanium	mg/L	0.001	<0.001	<0.001
Uranium	mg/L	0.0004	<0.0004	<0.0004
Vanadium	mg/L	0.0001	<0.0001	<0.0001
Zinc	mg/L	0.001	0.003	0.005
Zirconium	mg/L	0.0001	<0.0001	<0.0001

Table 4: Summary of Groundwater Sampling Results

	Unit	DL	MW09-01	MW09-03	MW09-3-2	MW09-03	MW09-03 DUP	Blank	Blank
Zone#	-		3	1	2	3	3	-	-
Sample Label			MW09-1-3	MW09-3-1	MW09-3-2	MW09-3-3	MW09-3-4	MW09-1-5	MW09-04-04
Sample Id	-	-	3305934	3305937	3305938	3305939	3305940	3305935	3305936
Sample Location	-	-	West Pit	Minto North	Minto North	Minto North	Minto North	West Pit	Camp
Date Sampled	m/dd/yyyy	-	3/30/2010	3/29/2010	3/29/2010	3/29/2010	3/29/2010	3/30/2010	3/29/2010
Sample Depth	m	0.1	24.7	37.9	24.2	10.5	-	-	-
Completed Date	m/dd/yyyy		4/12/2010	4/12/2010	4/12/2010	4/12/2010	4/12/2010	4/12/2010	4/12/2010
Matrix	-	-	Water	Water	Water	Water	Water	Water	Water
<b>Physical Tests</b>									
pH @25°C	(1)	-	8.04	8	8.05	7.84	7.79	6.46	6.15
Electrical Conductivity	µS/cm	1	941	315	502	158	161	2	1
Hardness as CaCO3	mg/L	5	336	144	178	69	71	<5	<5
T-Alkalinity as CaCO3	mg/L	5	184	137	130	63	67	<5	<5
Turbidity	NTU	0.1	64	2.5	3	0.3	0.7	0.4	0.1
Total Suspended Solids	mg/L	1	70	<4	<7	<4	<4	<3	<3
Total Dissolved Solids	mg/L	5	630	196	324	114	112	32	12
Colour	CU	5	<5	<5	<5	<5	<5	<5	<5
<b>Major Anions and Cations</b>									
Carbonate	mg/L	6	<6	<6	<6	<6	<6	<6	<6
Calcium	mg/L	0.1	93.7	41.2	56.3	23.4	24.2	<0.1	<0.1
Magnesium	mg/L	0.1	24.7	9.9	9.2	2.4	2.6	<0.1	<0.1
Sodium	mg/L	0.1	53.3	5.7	24.9	2.6	2.7	<0.1	<0.1
Phosphorus	mg/L	0.01	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Potassium	mg/L	0.1	7	4.4	6.6	2.3	2.2	0.7	0.6
Silicon	mg/L	0.05	3.39	4	3.7	3.85	3.98	3.38	<0.05
Bicarbonate	mg/L	5	220	170	160	80	80	<5	<5
Hydroxide	mg/L	5	<5	<5	<5	<5	<5	<5	<5
Ionic Balance	%	-	106	115	108	116	111	-	-
<b>Anions and Nutrients</b>									
Ammonium - N	mg/L	0.05	6.16	0.35	0.99	<0.05	<0.05	<0.05	<0.05
Total Kjeldahl Nitrogen	mg/L	0.06	8.89	0.4	1.22	<0.06	<0.06	<0.06	<0.06
Total Phosphorus	mg/L	0.05	0.09	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Orthophosphate-P	mg/L	0.01	0.06	0.06	0.07	0.06	0.06	0.06	<0.01
Nitrate and Nitrite - N	mg/L	0.01	21.6	0.26	16.1	0.47	0.48	0.02	<0.01
Chloride	mg/L	0.02	18.5	0.4	3.82	0.61	0.61	0.24	<0.02
Sulfate (SO4)	mg/L	0.6	169	23	48.9	10	10	<0.6	<0.6
<b>Total Metals</b>									
Aluminum	mg/L	0.005	1.31	0.043	0.03	0.01	0.014	<0.005	<0.005
Antimony	mg/L	0.0002	0.0005	0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.0002
Arsenic	mg/L	0.0002	0.0012	0.0004	0.0015	<0.0002	<0.0002	<0.0002	<0.0002
Barium	mg/L	0.001	0.186	0.05	0.036	0.013	0.01	<0.001	<0.001
Beryllium	mg/L	0.00004	0.00005	<0.00004	<0.00004	<0.00004	<0.00004	<0.00004	<0.00004
Bismuth	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	mg/L	0.004	0.095	0.29	1.92	0.034	0.034	0.016	0.01
Cadmium	mg/L	0.00001	0.00014	0.00011	0.00004	0.00001	0.00006	<0.00001	<0.00001
Calcium	mg/L	0.05	98.7	42.5	59.3	24.9	24.9	<0.05	<0.05
Chromium	mg/L	0.0004	0.0072	0.0022	0.0014	<0.0004	0.0006	<0.0004	<0.0004
Cobalt	mg/L	0.00002	0.00147	0.00019	0.00022	0.00007	0.00006	<0.00002	<0.00002
Copper	mg/L	0.001	0.029	0.006	0.008	0.004	0.004	<0.001	<0.001
Iron	mg/L	0.01	3.37	0.183	0.175	0.027	0.047	0.026	<0.01
Lead	mg/L	0.0001	0.001	0.0003	0.0003	0.0002	0.0002	0.0001	<0.0001
Lithium	mg/L	0.001	0.003	0.003	0.005	<0.001	<0.001	<0.001	<0.001
Magnesium	mg/L	0.05	26.8	10.4	9.76	2.62	2.63	<0.05	<0.05
Manganese (Trace)	mg/L	0.0002	0.225	0.123	0.0677	0.0132	0.009	0.0002	<0.0002
Manganese (SemiTrace)	mg/L	0.005	0.219	0.118	0.06	0.007	<0.005	<0.005	<0.005
Mercury	ug/L	0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Molybdenum	mg/L	0.0001	0.146	0.006	0.0468	0.0065	0.0051	<0.0001	<0.0001
Nickel	mg/L	0.001	0.006	0.007	0.002	<0.001	0.001	<0.001	<0.001
Potassium	mg/L	0.1	7.2	4.2	6.8	2.1	1.9	0.1	<0.1
Selenium	mg/L	0.0006	0.0019	<0.0006	0.0029	<0.0006	<0.0006	<0.0006	<0.0006
Silicon	mg/L	0.05	7	4.6	4.11	4.4	4.39	3.7	<0.05
Silver	mg/L	0.00001	0.00012	0.00006	0.00017	0.00004	0.00003	<0.00001	<0.00001
Sodium	mg/L	0.02	56.9	7.37	25.7	3.08	3.07	0.13	0.3
Strontium	mg/L	0.001	1.43	0.886	0.785	0.126	0.127	<0.001	0.001
Sulfur	mg/L	0.1	58.3	7.3	15.8	3.4	3.4	<0.1	<0.1
Tellurium	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Thallium	mg/L	0.00001	0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Thorium	mg/L	0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
Tin	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Titanium	mg/L	0.001	0.079	0.002	<0.001	<0.001	<0.001	<0.001	<0.001
Uranium	mg/L	0.0004	<0.0004	0.0015	0.0014	<0.0004	<0.0004	<0.0004	<0.0004
Vanadium	mg/L	0.0001	0.0049	0.0003	0.0005	0.0003	0.0004	<0.0001	<0.0001
Zinc	mg/L	0.001	0.025	0.016	0.01	0.01	0.01	0.003	0.005
Zirconium	mg/L	0.0001	0.0005	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001

Table 4: Summary of Groundwater Sampling Results

	Unit	DL	MW09-01	MW09-03	MW09-3-2	MW09-03	MW09-03 DUP	Blank	Blank
Zone#	-		3	1	2	3	3	-	-
Sample Label			MW09-1-3	MW09-3-1	MW09-3-2	MW09-3-3	MW09-3-4	MW09-1-5	MW09-04-04
Sample Id	-	-	3305934	3305937	3305938	3305939	3305940	3305935	3305936
Sample Location	-	-	West Pit	Minto North	Minto North	Minto North	Minto North	West Pit	Camp
Date Sampled	m/dd/yyyy	-	3/30/2010	3/29/2010	3/29/2010	3/29/2010	3/29/2010	3/30/2010	3/29/2010
Sample Depth	m	0.1	24.7	37.9	24.2	10.5	-	-	-
Completed Date	m/dd/yyyy		4/12/2010	4/12/2010	4/12/2010	4/12/2010	4/12/2010	4/12/2010	4/12/2010
Matrix	-	-	Water	Water	Water	Water	Water	Water	Water
<b>Dissolved Metals</b>									
Aluminum	mg/L	0.005	0.048	<0.005	<0.005	<0.005	0.013	<0.005	<0.005
Antimony	mg/L	0.0002	0.0011	0.0009	0.0018	0.0009	0.0012	0.0007	0.0006
Arsenic	mg/L	0.0002	0.0007	0.0002	0.0012	<0.0002	<0.0002	<0.0002	<0.0002
Barium	mg/L	0.001	0.142	0.047	0.035	0.013	0.01	<0.001	<0.001
Beryllium	mg/L	0.00004	<0.00004	<0.00004	<0.00004	<0.00004	<0.00004	<0.00004	<0.00004
Bismuth	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	mg/L	0.004	0.095	0.106	1.99	0.04	0.042	0.007	<0.004
Cadmium	mg/L	0.00001	0.00015	0.00012	0.00072	0.00002	<0.00001	0.00002	<0.00001
Chromium	mg/L	0.0004	<0.0004	0.001	0.0013	<0.0004	<0.0004	<0.0004	<0.0004
Cobalt	mg/L	0.00002	0.00045	0.00014	0.0002	0.00009	0.00008	0.00004	0.00002
Copper	mg/L	0.001	0.021	0.004	0.006	0.005	0.004	0.001	<0.001
Iron	mg/L	0.01	0.18	0.04	<0.01	<0.01	0.03	<0.01	<0.01
Lead	mg/L	0.0001	0.0003	0.0011	0.0003	0.0007	0.0002	0.0001	0.0002
Lithium	mg/L	0.001	0.003	0.003	0.004	<0.001	<0.001	<0.001	<0.001
Manganese	mg/L	0.0002	0.168	0.109	0.0616	0.0129	0.0087	0.0003	<0.0002
Mercury	ug/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Molybdenum	mg/L	0.0001	0.148	0.0052	0.045	0.0064	0.0049	<0.0001	<0.0001
Nickel	mg/L	0.001	0.002	0.005	0.002	<0.001	<0.001	<0.001	<0.001
Selenium	mg/L	0.0006	0.0018	<0.0006	0.0028	<0.0006	<0.0006	<0.0006	<0.0006
Silver	mg/L	0.00001	<0.00001	<0.00001	0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Strontium	mg/L	0.001	1.41	0.863	0.739	0.125	0.12	<0.001	<0.001
Sulfur	mg/L	0.2	56.2	7.6	16.3	3.4	3.5	<0.2	<0.2
Tellurium	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Thallium	mg/L	0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Thorium	mg/L	0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
Tin	mg/L	0.0001	0.0003	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Titanium	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Uranium	mg/L	0.0004	<0.0004	0.0015	0.0014	<0.0004	<0.0004	<0.0004	<0.0004
Vanadium	mg/L	0.0001	0.0003	0.0001	0.0004	0.0002	0.0004	<0.0001	<0.0001
Zinc	mg/L	0.001	0.016	0.014	0.005	0.005	0.004	0.004	0.004
Zirconium	mg/L	0.0001	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001

This report, “**Minto Mine: Groundwater Monitoring System Sampling**”, has been prepared by SRK Consulting (Canada) Inc.:

**Prepared by**

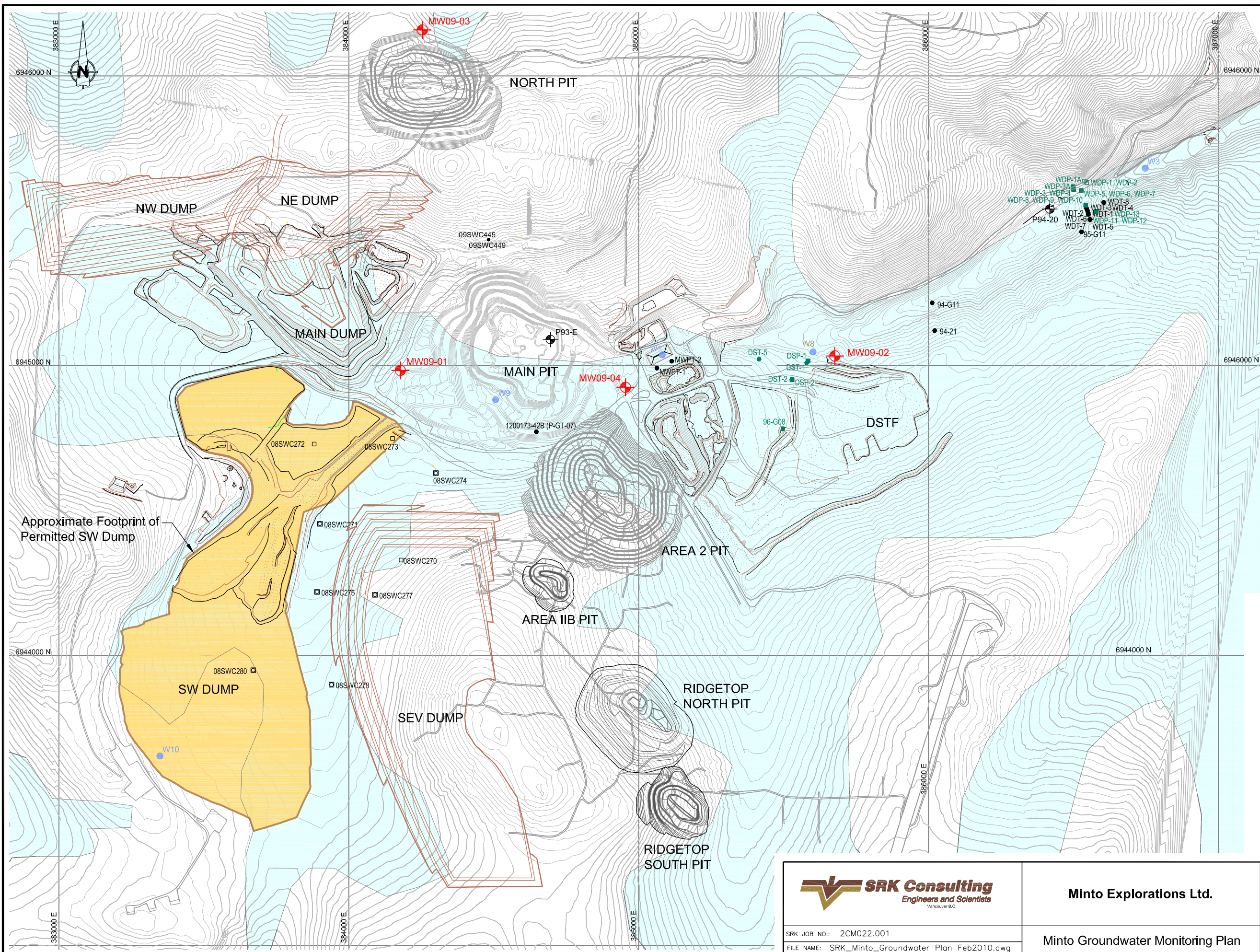
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Michael Royle, M.App.Sci., P.Geo. (BC & NT)  
Principal Hydrogeologist

## Figures

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**LEGEND**

- SURFACE WATER MONITORING LOCATIONS
- GROUND TEMPERATURE CABLE (T)
- GROUND TEMPERATURE CABLE (T) & CASAGRANDE PIEZOMETER (P)
- VIBRATING WIRE PIEZOMETER (P)
- CASAGRANDE PIEZOMETER (P)
- PERMAFROST (assumed; taken from HRP drawing of scollification areas, 1994)
- ⊕ MP WELL LOCATION

0 100 200 300 400 500  
Scale in Metres

**SRK Consulting**  
Engineers and Scientists  
Vancouver B.C.

SRK JOB NO.: 2CM022.001  
FILE NAME: SRK\_Minto\_Groundwater Plan Feb2010.dwg

**Minto Explorations Ltd.**

**Minto Groundwater Monitoring Plan**

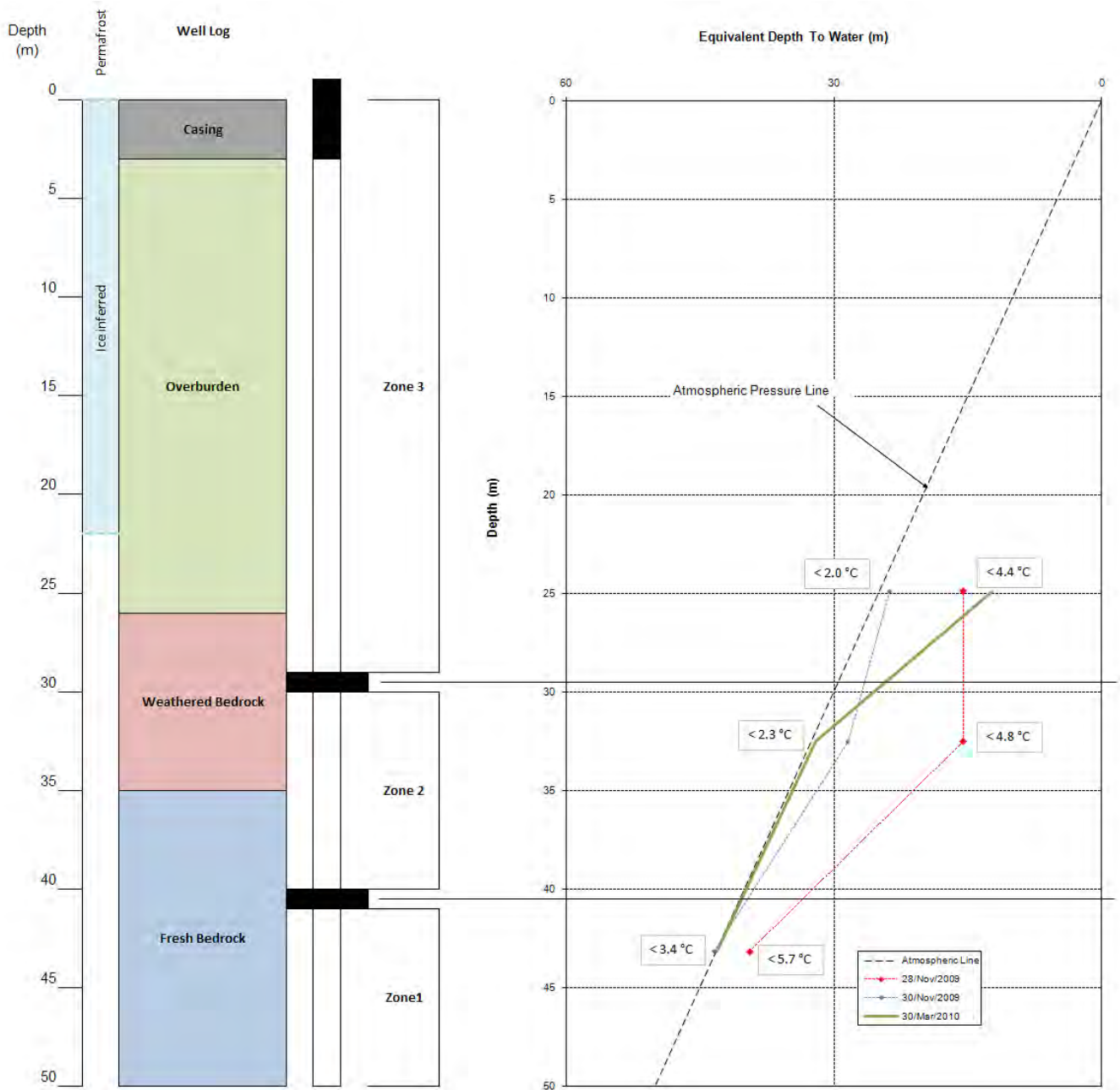
**Groundwater Monitoring Locations**

DATE: Feb. 5, 2010	APPROVED: MDR	FIGURE: 1
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# MW09-01



Minto Explorations Ltd.

Groundwater Monitoring Locations

Job No: 2CM022.001  
 Filename: Fig2\_MW09-01\_MPLog&Pressure\_Apr10

Minto Groundwater Monitoring Plan

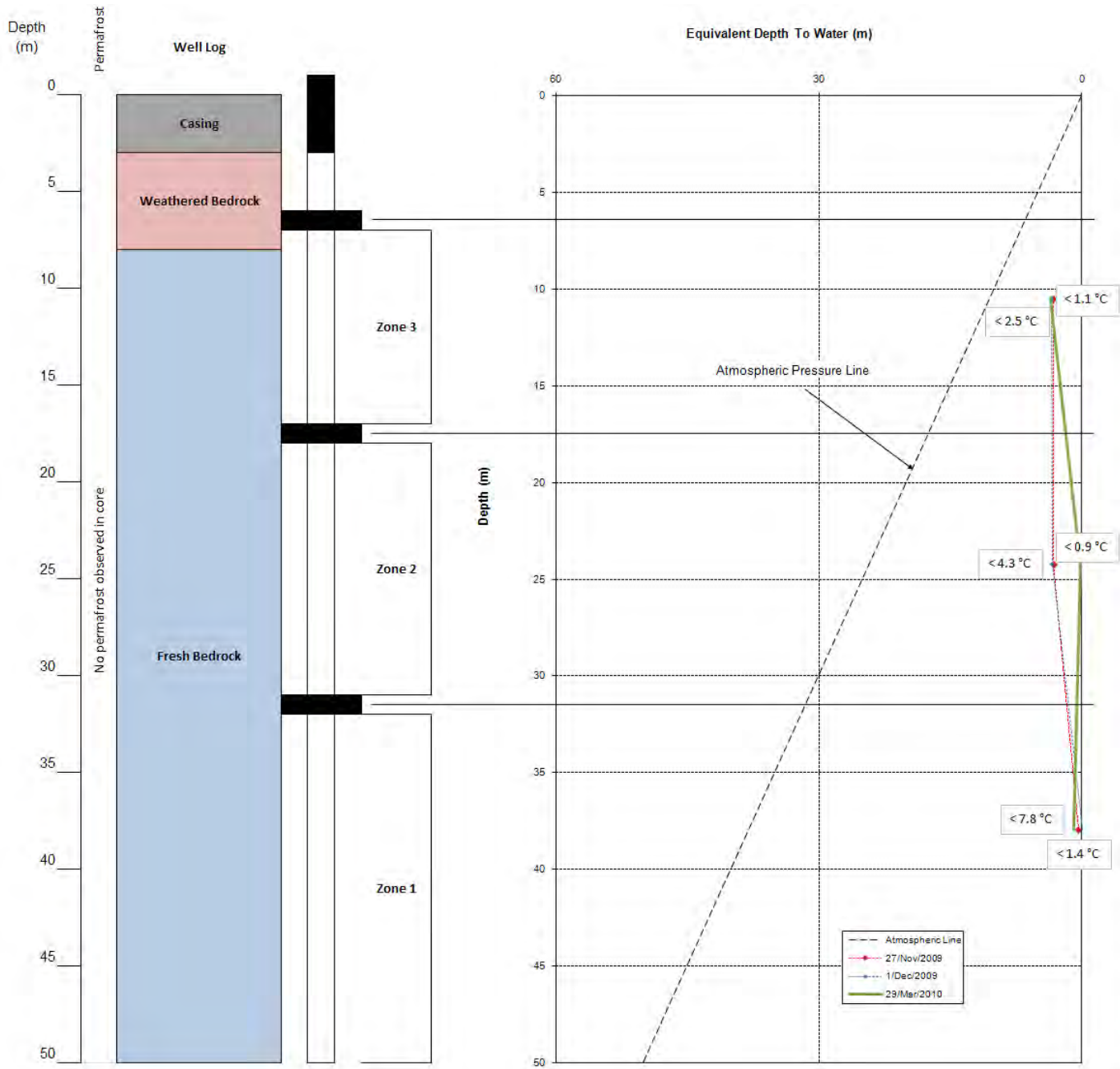
Date: May 12, 2010

Approved: MDR

Figure:



# MW09-03



Minto Explorations Ltd.

Groundwater Monitoring Locations

Job No: 2CM022.001  
 Filename: Fig3\_MW09-03\_MPLog&Pressure\_Apr10

Minto Groundwater Monitoring Plan

Date: May12, 2010	Approved: MDR	Figure: <b>3</b>
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**Appendix A**  
**Sampling Records**

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# Minto Mine Phase V/VI Expansion: Hydrogeological Characterization Report

Prepared for

Minto Explorations Ltd.



Prepared by



SRK Consulting (Canada) Inc.  
1CM002.008.301  
May 2013

# Minto Mine Phase V/VI Expansion: Hydrogeological Characterization Report

May 2013

**Prepared for**

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# 1 Introduction

SRK Consulting (Canada) Inc. was contracted by Minto Explorations Ltd. to develop a hydrogeological conceptual model that characterizes the groundwater flow regime of the Minto Mine site in order to determine flow paths and where these will discharge to surface receiving bodies. The model is designed to address the central issues of how groundwater moves through the site and how it is potentially impacted by mining activities. The model also considers the possible follow-on effects to the receiving environment, where groundwater discharges to surface water bodies.

This report is intended to compile the existing hydrogeological knowledge of the site and to integrate this knowledge with the overall site hydrology in the context of the proposed plans for mine expansion. The hydrogeological conceptual model is used to determine the probable flow paths of groundwater through the site, the controlling factors for volume and rate of flow, and the areas where water may come into contact with sources of potential parameters of concern.

## 2 Hydrogeological Environment

### 2.1 Site Description

The Minto Mine is situated in the headwaters of Minto Creek (Figure 1), which drains northeast to the Yukon River. The Minto Creek catchment is characterized by moderate to steep slopes to the north, south, and west. The portion of the catchment occupied by the mine is known as Upper Minto Creek; this upper catchment covers approximately 1,040 ha of the larger 4,100 ha Minto Creek catchment, and is defined as the catchment area up gradient of the Water Storage Dam (SRK 2012b). The catchment below the water dam contains no mine components, and is known as Lower Minto Creek.

The groundwater flow regime is affected by several contributing factors including topography, climate, overburden, bedrock, major structures, and permafrost. At Minto, groundwater flow direction is dominated by topography, with groundwater flowing from the upland areas towards Minto Creek, as indicated by the arrows shown in Figure 2. The influences of these contributing factors are discussed throughout Section 2.

The conceptual model describes the groundwater flow regime at Minto Mine. It allows the site to be characterized based on the data available from multiple studies conducted on the property. Although the conceptual model does not provide quantitative results like outputs of a numerical model, it does provide a comprehensive description of groundwater flow at the site.

The flow regime at Minto Mine is a relatively simple groundwater system, but the system has some components that are difficult to characterize. With the exception of Minto North Pit, the entire mine footprint exists in a single catchment with Minto Creek as its main channel of surface discharge. However, permafrost distribution is not comprehensively known as it is discontinuous and is undoubtedly affected by mining, which results in changes in the location of permafrost boundaries over time. As permafrost creates an aquiclude (groundwater barrier), precise groundwater flow paths are challenging to determine or incorporate into a numerical model. Because the system has a main drainage location (Minto Creek), groundwater can be monitored

at multiple points along the gradient, thus providing the opportunity to track possible effects on groundwater.

Another factor that could significantly affect the groundwater flow regime is the fractured bedrock. Fractures in the bedrock have the potential to act as conduits for groundwater flow if they are well connected and are not blocked by low permeability materials such as clay. This factor is also difficult to characterize in a numerical groundwater model, even if extensive data is available. However, observations of drill core indicate that the bedrock generally has tight fractures or fractures filled with weathered material including clay and hematite.

The proposed Minto North Pit is part of the McGinty Creek watershed (Figure 2). The catchment containing the pit has an area of approximately 100 ha, and is located in the upper portion of the east tributary of McGinty Creek. Minto North Pit is the only component of the proposed mine expansion within this catchment. Preliminary water quality modelling has indicated that the development of Minto North Pit is unlikely to lead to significant water quality effects (SRK 2013c). Throughout pit operations, the pit sump water will be pumped into the Minto Creek watershed and managed with all other mine water; this pumping will result in a short term depression of the local water table. After pit operations are complete, it is expected that groundwater and local surface runoff will accumulate in the pit resulting in the groundwater table rebounding to near the pre-mining elevation.

## 2.2 Climate

The mine is located in a subarctic climate, typically characterized by long, cold winters and cool, mild summers (ACG 2012a). Minto Mine typically experiences precipitation throughout the year, with more snowfall than rain. Details regarding the baseline climate data are presented in the Minto Climate Baseline Report: YESAB Project Proposal Phase V/VI (ACG 2012a).

The mean annual temperature is  $-2^{\circ}\text{C}$ , with winter temperatures typically ranging from  $-10$  to  $-30^{\circ}\text{C}$  and summer ranging from  $10$  to  $20^{\circ}\text{C}$ . Wind direction is predominantly south to southeast and north to northwest with an average speed of approximately  $10$  km/h, dependent on height above ground surface. Relative humidity is highest during the winter months,  $75$  to  $95\%$ , and lowest in spring and early summer,  $40$  to  $60\%$ , with an annual average of  $71\%$ . Average daily mean temperatures recorded from October through March are below  $0^{\circ}\text{C}$ , representing the time of year where infiltration is reduced or not possible due to a frozen ground surface.

### 2.2.1 Hydrology

Total precipitation has been monitored on site in two locations and correlated with the Pelly Ranch meteorological station to determine the estimated mean annual precipitation to be  $329$  mm/year (SRK 2012b). The mean annual precipitation includes rainfall and snowfall, using snow water equivalent measurements.

The site-wide water balance estimated that the total runoff for the catchment area above the Water Storage Dam (WSD) was  $925,000$  m<sup>3</sup> for 2012 (SRK 2012b). The 2012 runoff is consistent with the runoff coefficient of  $0.3$  that has been estimated for the site (SRK 2013a).



There are three weirs set up for monitoring along Minto Creek where continuous water level monitoring is conducted for the open water season, which spans approximately early May through mid-October. The weirs are affected by controlled release of water from the site; however, rainfall events are still evident in the hydrographs (ACG 2012b).

## **2.3 Overburden**

Overburden thickness across the site is correlated with geomorphological features. Near topographic highs (or ridges) there is little to no overburden, while overburden thickness increases down valley slopes and is generally thickest in valley bottoms. Unconsolidated material deposited along the valley bottom varies in thickness. Typically, the ridge tops are dominated by sandy, residual soils grading to weathered bedrock. It is generally observed that fine weathering products have been washed down slope. Overburden in the valley bottoms consists of finer materials dominated by sandy silts and clays (SRK 2008a). A representative selection of drill hole logs from various geotechnical drilling programs is presented in Appendix A; collar locations are shown in Figure 3. The drill holes shown in Appendix A provide spatial coverage within the core site footprint and high quality data regarding depth to bedrock. In isolated cases, drill holes that did not reach bedrock are also included; these provide minimum bedrock depths.

### **2.3.1 Thickness and Distribution**

Several geotechnical studies have been conducted across the site (e.g. Golder 1974; SRK 2007; EBA 2009–2011 and 2012). Figure 3 presents the overburden depth determined from these studies. It should be noted that overburden thicknesses for the Dry Stack Tailings Storage Facility generally represent data collected post-construction, and therefore reflect combined tailings and overburden thickness. The drill holes located at the toe of the Southwest Waste Dump were drilled prior to the full extent of the current waste rock and provide a good indication of the overburden depth.

Along the ridge near the proposed Ridgetop North and Ridgetop South pits, bedrock is close to the surface (less than 15 m). In most cases, the bedrock is within 5 m of the surface. The proposed Minto North Pit also has minimal overburden near the ridge top.

To the north/northeast of the Dry Stack Tailings Storage Facility, overburden is controlled by the steep valley slopes and Minto Creek cutting through the bottom of the valley. The overburden thickness near the creek bed is less than 15 m, but increases in some areas, especially along the southern valley slopes. In some areas, this overburden can exceed 50 m, but typically ranges between 30 and 50 m.

### **2.3.2 Material Composition**

The ridge tops to the north and south of the mine footprint have little overburden, and that which exists consists of sandy residual soils that grade into weathered bedrock. In the valley east of the Southwest Waste Dump, the subsurface soils consist of sand and silt layers that overlie the residual sandy soil and weathered bedrock. Some locations have a mix of sand, silt, and gravel layers with no clear stratigraphic continuity evident through the valley.

Fill has been placed in the mine's central area near the Main Pit, the mill, the administration and the camp buildings and extends up to 8 m below current ground surface. The fill overlies overburden consisting of sandy silt, with gravel and some cobbles throughout. The overburden transitions to weathered bedrock between 15 and 20 m below ground surface at the time of drilling (predominantly 2010 and 2011).

Below the Dry Stack Tailings Storage Facility, overburden is generally fine-grained silt or silt and sand overlying ice rich layers of silts and clays. This layered type of overburden continues along the valley to the east, which overlies residual sandy soils and weathered bedrock with depth.

## 2.4 Bedrock

The Minto Mine site is underlain predominantly by igneous rocks of granodiorite composition. The granodiorite is generally categorized based on textures which are associated with foliation and crystal size. Rock texture ranges from massive granodiorite to foliated granodiorite, with foliated granodiorite typically characterized by increased biotite content. The biotite-rich foliated granodiorite hosts mineralized zones of copper sulphide. Crystal textures range from equigranular to porphyritic.

Other minor lithologies consisting of small dykes of simple quartz-feldspar pegmatite, aplite, and an aphanitic textured intermediate composition rock are also observed. Bodies of all of these units are relatively thin and rarely exceed one metre core intersections. These dykes are relatively late, generally postdating the peak ductile deformation event; however, some pegmatite and aplite bodies observed in a rock cut located north of the mill complex are openly folded. There has been evidence of conglomerate and volcanic flows in drill core by past operators, and drilling has demonstrated that a conglomerate unit bearing local granodiorite pebbles occurs across much of the southern part of the project area. This is of particular note in the vicinity of the proposed Ridgetop North and Ridgetop South pits.

### 2.4.1 Structure

Structure can have a significant impact on groundwater flow if structures have a higher hydraulic conductivity than that of the surrounding rock. Although there is evidence both regionally and locally of multiple structures and structure types, this section discusses the structures that have been identified on site as structures of interest with respect to groundwater flow.

There are both ductile and brittle phases of deformation around the Minto deposits. Copper-sulphide mineralization is strongly associated with foliated granodiorite. This foliation is defined by the alignment of biotite in areas of weak to moderate strain, and by the segregation of quartz and feldspar into bands in areas of higher strain, giving the rock a gneissic texture in very strongly deformed areas. The deformation zones form sub-horizontal horizons within the more massive plutonic rocks of the region and can be traced laterally for more than 1,000 m in the drill core. They are often stacked in parallel to sub-parallel sequences (SRK 2013c).

The Minto Creek Fault (MC Fault) bisects the Minto Main deposit, dividing it into north and south areas and is modeled as dipping steeply north-northeast with an apparent left lateral reverse displacement. The northern block moved up and to the west relative to the southern block. Both the vertical and horizontal displacements are evident by offsets in the main zone mineralization

and appear to be minimal. A lack of marker horizons in the plutonic rocks, however, makes it difficult to determine the absolute magnitude of the movement (SRK 2008b).

The DEF Fault defines the northern end of the Minto Main deposit. It strikes more or less east-west and dips north-northwest and cuts off the Main Zone mineralization. The vertical orientation of most of the drilling is less than optimal to intersect steep to vertical faults; the DEF fault may have a similar sense of movement to the MC fault, however, a significant amount of displacement is inferred. (SRK 2013c).

The mineralization in the proposed Ridgetop North and Ridgetop South pits is also controlled by structure. The boundary between the Area 2 and Area 118 pits is defined by a northeast dipping fault. At least two parallel structures have also been identified in Area 118 (SRK 2008b).

## **2.5 Permafrost**

### **2.5.1 Spatial Distribution**

Instrumentation to monitor ground temperatures has been installed across the site as part of various studies conducted since 1974. The current general understanding of permafrost distribution is presented in Figure 4 (adapted from EBA 2011), as understood from a combination of drill results, test pit results, surficial mapping, and interpretation of aerial photographs. Although the available data does not allow for unequivocal mapping of areas of permafrost, the distribution of the permafrost across the site has been characterized to a degree that is adequate for developing a conceptual hydrogeological model and for planning the groundwater monitoring system layout.

Generally, the west to east trend of the upper Minto Creek valley bottom (extending from down gradient of the Southwest Waste Dump, past the mill and administration buildings, the Dry Stack Tailings Storage Facility, and along the north facing slopes of the Minto Creek drainage upstream of the Water Storage Dam) coincides with the permafrost region. The north facing slopes (at the southern edge of the property) have geomorphic and vegetation evidence suggesting the presence of permafrost or discontinuous permafrost, except along the crests of the ridges which are generally free of permafrost. The south facing slopes and ridges may or may not have permafrost, based on observations of both frozen and unfrozen ground conditions in these areas.

### **2.5.2 Effects on Groundwater Flow System**

Permafrost plays a significant role in the groundwater flow system on the site as it forms a confining layer (or aquiclude) for flow below the frozen ground and inhibits infiltration from the overlying active layer. The lack of permafrost in the bed and adjacent areas of Minto Creek (SRK 2013c) indicates that groundwater and surface water can interact along the axis of the creek and that by-pass of surface and/or shallow groundwater monitoring points below a permafrost layer is unlikely.

As permafrost limits infiltration into the groundwater system, it can also prevent contaminants from entering the deeper groundwater system. One of the areas where this is most notable is along the valley between the Southwest Waste Dump and the proposed Ridgetop Waste Dump. The valley has many small surface channels during spring and summer, but also has evidence of

permafrost. Groundwater will either tend to report to the ephemeral supraperafrost channels (in the case of shallow groundwater) or stay below the permafrost layer (in the case of deeper groundwater) until it reports to the Main Pit.

## 2.6 Hydraulic Conductivity

Hydraulic conductivity data have been collected during two studies at Minto Mine. The first tests were a series of packer injection tests conducted by Golder Associates as part of the initial mine feasibility studies (Golder 1974). These tests were carried out in the vicinity of the Main Pit at various depths within bedrock, and were categorized by multiple rock characteristics:

- completely weathered (CW),
- highly weathered (HW),
- moderately weathered (MW),
- slightly weathered (SW), and
- fresh jointed (FJ).

The results from these tests are presented in Table 1. It should be noted that tests were not conducted in massive rock and therefore the results in Table 1 are biased towards more permeable zones to a certain extent.

In the second study, rising head tests were completed as part of the multi-port (MP) monitoring well installation program in the fall of 2012 (SRK 2013b). These tests were conducted primarily in bedrock with the exception of one test in overburden. Analyses of these tests can be found in Appendix B. Table 1 also summarizes the 2012 results using the same rock categories as those presented by Golder (1974). Where multiple tests were conducted, a mean result for the interval is presented.

The bulk hydraulic conductivity for different bedrock and overburden characteristics is presented in Table 2. These represent the best estimate of hydraulic conductivity for each of the rock categories on site. These values were obtained by averaging all available tests for a given rock condition and they seem reasonable, based on observations of pit wall rock, drill core, typical literature values, and experience elsewhere.

Of note is the observation that the “fresh jointed” rock does not exhibit increased hydraulic conductivity when compared to all other rock categories. This implies that the jointing is not well connected through the rock mass (i.e., the fractures do not interlink to provide a flow path). Therefore, it appears that rock on site is consistently low K with a low probability of extensive higher K zones that could transmit significant water flux. The overburden hydraulic conductivity value presented in Table 1 is situated in frozen ground.

**Table 1: Compiled Hydraulic Conductivity Data.**

Hole ID	Test Type	Test Depth (m)	Rock Condition	Hydraulic Conductivity (m/s)
75	Packer Injection Test	40 - 43	MW	$6 \times 10^{-07}$
77	Packer Injection Test	46 - 49	HW	$9 \times 10^{-08}$
		55 - 59	MW	$6 \times 10^{-08}$
		61 - 65	MW	$5 \times 10^{-08}$
		67 - 71	MW	$5 \times 10^{-08}$
		73 - 77	HW	$6 \times 10^{-08}$
		80 - 83	HW	$5 \times 10^{-08}$
		86 - 89	MW	$6 \times 10^{-08}$
		92 - 95	MW	$5 \times 10^{-08}$
		98 - 101	MW	$5 \times 10^{-08}$
79	Packer Injection Test	104 - 107	SW	$3 \times 10^{-08}$
		43 - 46	FJ	$6 \times 10^{-08}$
		52 - 55	SW	$7 \times 10^{-08}$
		58 - 61	FJ	$5 \times 10^{-07}$
		64 - 67	FJ	$8 \times 10^{-08}$
		70 - 73	FJ	$2 \times 10^{-08}$
		76 - 80	FJ	$8 \times 10^{-08}$
		82 - 86	SW	$6 \times 10^{-08}$
		88 - 92	FJ	$7 \times 10^{-08}$
84	Packer Injection Test	94 - 98	FJ	$6 \times 10^{-08}$
		101 - 104	SW	$9 \times 10^{-08}$
84	Packer Injection Test	22 - 25	HW	$2 \times 10^{-06}$
87	Packer Injection Test	21 - 25	MW	$9 \times 10^{-08}$
		40 - 43	SW	$4 \times 10^{-08}$
		58 - 61	SW	$3 \times 10^{-08}$
		64 - 70	SW	$3 \times 10^{-08}$
		76 - 80	FJ	$5 \times 10^{-08}$
		85 - 89	FJ	$4 \times 10^{-08}$
89	Packer Injection Test	101 - 104	FJ	$2 \times 10^{-08}$
		25 - 28	CW	$1 \times 10^{-07}$
		28 - 31	HW	$1 \times 10^{-07}$
		34 - 37	HW	$3 \times 10^{-07}$
		40 - 43	MW	$8 \times 10^{-08}$
		46 - 49	CW	$7 \times 10^{-08}$
MW12-05	Rising head	55 - 59	HW	$6 \times 10^{-08}$
		136	FJ	$4 \times 10^{-09}$
		98	FJ	$1 \times 10^{-07}$
		52	SW	$7 \times 10^{-07}$
MW12-06	Rising head	18	HW	$1 \times 10^{-08}$
		126	FJ	$4 \times 10^{-07}$
		70	SW	$2 \times 10^{-07}$
MW12-07	Rising head	22	overburden	$5 \times 10^{-09}$
		136	SW	$1 \times 10^{-07}$
		103	HW	$2 \times 10^{-08}$

Source: \\VAN-SVR0\Projects\01\_SITES\Minto\1CM002.008\_Hydrogeology\_2012\1080\_Deliverables\Hydrogeological Conceptual Model\020\_Tables

**Table 2: Assumed Bulk Hydraulic Conductivity Values.**

Rock Condition	Hydraulic Conductivity (m/s)
Overburden & Highly Weathered Bedrock	$2 \times 10^{-07}$
Moderately Weathered Bedrock	$6 \times 10^{-08}$
Non-Weathered Bedrock	$8 \times 10^{-08}$
Fault Zone	$5 \times 10^{-09}$

Source: \\VAN-SVR0\Projects\01\_SITES\Minto\1CM002.008\_Hydrogeology\_2012\1080\_Deliverables\Hydrogeological Conceptual Model\020\_Tables

## 2.7 Water Level Data

SRK installed three standpipes down gradient of the proposed Ridgetop North and Ridgetop South pits (SRK 2012a and Figure 1). Figures 5 to 8 give the temperature profiles over time along the ridge. With the exception of the active layer, permafrost is present in two of the ridge top monitoring wells (MW11-02 and MW11-03). MW11-04A thermistor data reports above freezing temperatures, but no recent samples have been collected as this well is still being developed. Temperatures in monitoring well MW11-01A are above freezing at depth, and portions of the overburden around the Main Pit are expected to be absent of permafrost.

The multi-piezometer (MP) monitoring wells installed in 2009 and 2012 provide water level data that can be used in conjunction with permafrost data to determine the flow of groundwater (SRK 2009, SRK 2012a, SRK 2012b). Appendix C provides the piezometric levels in each of the active MP wells. The design of each MP well is presented in Appendix D.

The pressure profiles show that most of the locations exist in hydrostatic conditions and therefore limited vertical groundwater flow will occur. In other words, the groundwater flux is expected to be dominated by horizontal flow.

## 3 Groundwater Flow Regime

### 3.1 Upper Minto Creek

A series of cross sections have been used to aid the following discussion of the groundwater flow regime within the upper Minto Creek watershed. Figure 9 presents the map of the section lines for the sections provided in Figures 10 to 18. These sections display the current topography, bedrock surface (modeled), and existing and expected pit development. Representative flow lines are shown and illustrate how the topography dominates flow direction.

Where permafrost occurs, it is expected that most groundwater will be confined and travel beneath the permafrost layer, with minor seasonal flow occurring through the near-surface active layer. As the permafrost depth across the site is not well delineated, it is represented schematically in the cross sections for purposes of illustration.

Section A (Figure 10) is perpendicular to the Minto Creek valley and was selected to illustrate the typical flow patterns expected down gradient of the Water Storage Dam, across the narrow part of the valley where steep slopes are present. Each end of the section is on a ridge, which are both the topographical and groundwater divides. It is expected that permafrost exists on the south

slope as that is consistent with other south-facing slopes on site, but there is no thermal ground data at this location in the valley. Groundwater will flow from the ridges on both sides and surface along the Minto Creek valley. On the south slope, groundwater will have minor seasonal suprapermafrost flow, and deeper water will be confined until it reaches the valley where it will then report to the creek.

Section B (Figure 11) was selected to show the flow regime expected in the vicinity of the Dry Stack Tailings Storage Facility (DSTSF). The section terminates on a ridge to the north of the DSTSF and at a ridge near the airstrip. Bedrock is close to or at surface near the northern ridge, so shallow groundwater is expected to travel within the weathered bedrock. From the ridge near the airstrip, groundwater travels sub-permafrost beneath the DSTSF and to the Minto Creek valley. This slope contains permafrost, with seasonal flow through the active layer towards the valley.

Section C (Figure 12) demonstrates groundwater flows from ridge tops to the small valley between the Southwest Waste Dump (SWD) and the proposed Ridgetop Waste Dump. The valley is underlain by permafrost with ephemeral surface water channels. From the west, shallow groundwater will flow through and beneath the SWD, with the permafrost confining deeper water. Shallow groundwater will only flow through the active layer of the overburden before reporting to surface channels. Groundwater will flow down gradient from the east ridge to the valley, also directed to either shallow soils in the active layer or confined below the permafrost.

Section D (Figure 13) was selected to illustrate how groundwater will be directed from the ridge near the airstrip and the proposed Ridgetop pits towards the valley between these points. Since permafrost is present in this valley, the shallow groundwater will largely report to surface water in the valley bottom. Deeper groundwater will be confined by permafrost in the valley, which will then be topographically directed to the northwest beneath the DSTSF. The Ridgetop North Pit will contain saturated and unsaturated tailings post-closure, with the expectation that groundwater will continue to flow down gradient through the pit.

Section E (Figure 14) was selected to represent the groundwater flow regime across the Minto Creek valley down gradient of the Main Pit. The Area 2 Pit will contain saturated tailings while the Area 118 Pit will be backfilled with overburden. Permafrost will be affected by mining, and likely recede from the pit walls within the plane of this section, and groundwater will travel from the ridge top towards the mill area where it will be directed down the Minto Creek valley. Some shallow water will flow above permafrost, with deeper groundwater confined beneath the mill area as well. Groundwater from the north will also flow from ridge tops to the mill area and will merge with other groundwater moving eastward (out of this section) along the Minto Creek valley.

Section F (Figure 15) was selected to illustrate groundwater flow through the Minto North Pit to the McGinty Creek catchment, while groundwater to the south of the topographic divide will be directed toward the Main Pit. The Minto North Pit will fill with surface and groundwater inflows to a static water level that is expected to approximate pre-mining groundwater levels. Groundwater will flow from the ridge top down gradient into the McGinty Creek watershed. South of the Minto North Pit, groundwater will report to the Main Pit which will be full of saturated tailings. The ridge near the western edge of the Area 2 pit will also yield groundwater that will move towards the

Main Pit. It should be noted that this ridge will direct groundwater radially in multiple directions – north, east and west, as it is at the edge of multiple topographic divides.

Sections G through I (Figures 16 to 18) were selected to represent the groundwater paths along the length of the Upper Minto Creek valley. Section G starts at the edge of the west wall of the Main Pit and travels through the mill area where it intersects Section B. The Minto Creek valley continues with Section H, which traces along the Water Storage Pond and through the Water Storage Dam where it intersects Section A. Section I continues along the Minto Creek valley and terminates down gradient of all the mine components, into the Lower Minto Creek catchment. This section was terminated where ridges with bedrock close to or at surface are present, defining an ideal narrow point in the valley where overburden is expected to be limited.

These sections (G through I) show the approximate flow paths that groundwater on the site are expected to follow. At the western end of the section, groundwater is directed to the Main Pit and Minto Creek. Once directed here, it will continue along the valley towards the Yukon River. In Section G, groundwater is predominantly confined deep by permafrost until it is down gradient of the mill area. It will continue along the valley trace to the Water Storage Pond. The Water Storage Dam will be breached post-closure, removing the pond, but a saturated area similar to a wetland is expected to remain. Groundwater will then follow the trace of the valley to the Yukon River. It should be noted the valley floor doesn't have a steep topographical gradient, so groundwater movement does not have a large hydraulic head driving force. Furthermore, this trace along the Minto Creek valley is free of permafrost allowing groundwater to surface in the creek channel. There is an expectation that deeper regional groundwater also flows beneath the valley, but it is not expected to be affected by the mine components.

The faults identified in Section 2.4.1 are not expected to change the overall groundwater flow direction as they are not characterized by significantly different hydraulic conductivity than the surrounding fractured bedrock. Hydraulic testing conducted at MW12-06 across a fault zone that was characterized with over 1 m of completely altered clay material, yielded a hydraulic conductivity of  $5 \times 10^{-9}$  m/s. Artesian conditions below the fault also suggest this could be a confining unit, further supporting fault characteristics to restrict groundwater flow. The DEF fault has been similarly characterized as a groundwater barrier in previous studies (SRK 2009). Assuming these represent typical faults on the property, it is improbable that faults will act as conduits for significant water flow.

There is the possibility that groundwater may preferentially flow through fractured bedrock. However, being able to identify which fractures may be significant and connected across the site, or even within a defined zone, is a difficult feature to characterize. Geotechnical core logging conducted for three drill holes (SRK 2013c) found that fractures in the weathered bedrock were often filled with hematite or gouge, suggesting groundwater flow rates would be minimized. Fresh bedrock joints were often extremely tight, also restricting groundwater flow. As discussed in Section 2.6, the hydraulic conductivity of highly fractured rock was found to be similar to unfractured rock, indicating poor connectivity over the larger scale of rock mass.

Despite the difficulty of accurately characterizing the permafrost extent or the network of bedrock fractures, it is possible to adequately monitor groundwater at the Minto property. Since the system exists almost entirely in a single catchment, the strategically planned groundwater



network allows for the ability to monitor groundwater at multiple locations as it travels down gradient. Drivepoint piezometers have also been installed to monitor overburden groundwater flow down gradient of the Southwest Waste Dump and below the Mill Valley Fill (Stage 1).

All surface water is monitored and managed at Minto Mine. Any water released from the property from the Water Storage Pond must meet water use licence conditions (YWB 2012).

### **3.2 Minto North**

The proposed Minto North Pit is located in the headwaters of McGinty Creek, the catchment immediately north of Minto Creek. The pit will remain dewatered throughout the mining phase of the pit (approximately 1 to 2 years). All water - surface and groundwater - that flows into the pit will be pumped to the Minto Creek catchment and managed accordingly.

Since Minto North Pit is in the very upper part of the McGinty Creek headwaters, groundwater quality will not be affected by upstream mining activity (i.e., there are no additional mining activities upgradient of the pit). Similar to the Minto Creek catchment, topography within the McGinty Creek catchment is expected to control groundwater flow. As water will be pumped out of the pit during operations, groundwater will not be released into the environment, thereby ensuring Minto North Pit will not affect down gradient groundwater during operations. After mining is complete, the Minto North Pit will be allowed to fill with surface and groundwater inflows, and it is expected that the final lake water level will be similar to the pre-mining groundwater table elevation of 907 to 896 m above sea level.

A post-mining water and load balance was developed for the McGinty Creek catchment that indicated there will be no significant effect to water quality (SRK 2013a).

## **4 Water Chemistry Data**

The groundwater monitoring network was most recently updated in November 2012 (SRK 2013b). Initial sampling was conducted shortly after each well installation program. All of the groundwater chemistry data is presented in Appendix E. Table 4 presents selected chemistry data for all samples collected as of April 2013. The Groundwater Monitoring Plan (Minto 2013) was updated in 2013 to include all monitoring wells and specifies semi-annual sampling. Data from future monitoring will allow trends in groundwater chemistry to be identified.

**Table 3: Selected Chemistry Data.**

Well ID	Zone	Date	Selected Parameters (mg/L)					
			SO4-D	N-NO3	Cd-D	Cu-D	Se-D	Zn-D
MW09-01	2	30-Nov-2009	77	n/a*	0.000050	0.012	0.0028	0.0090
MW09-01	3	30-Nov-2009	83	n/a*	0.000080	0.020	0.0028	0.0060
MW09-01	3	30-Mar-2010	170	n/a*	0.00015	0.021	0.0018	0.016
MW09-01	4	30-Nov-2009	83	n/a*	0.000070	0.018	0.0030	0.0040
MW09-02	1	2-Dec-2009	170	n/a*	0.000090	0.0040	0.0067	0.010
MW09-02	3	2-Dec-2009	170	n/a*	0.000060	0.0030	0.0068	0.0070
MW09-03	1	1-Dec-2009	120	n/a*	0.00020	0.019	0.0080	0.022
MW09-03	1	29-Mar-2010	23	n/a*	0.00012	0.0040	<0.0006	0.014
MW09-03	1	10-May-2012	21	0.11	0.000085	0.0028	<0.00010	0.017
MW09-03	1	17-Nov-2012	22	0.069	0.00068	0.0018	0.000052	0.011
MW09-03	2	1-Dec-2009	110	n/a*	0.000080	0.022	0.0067	0.010
MW09-03	2	29-Mar-2010	49	n/a*	0.00072	0.0060	0.0028	0.0050
MW09-03	2	10-May-2012	<0.50	0.10	0.000028	0.0011	0.00020	0.0053
MW09-03	2	17-Nov-2012	<0.50	0.035	<0.000025	0.00073	<0.00020	0.0080
MW09-03	3	1-Dec-2009	10	n/a*	0.000070	0.0050	<0.0006	0.012
MW09-03	3	29-Mar-2010	10	n/a*	0.000020	0.0050	<0.0006	0.0050
MW09-03	3	10-May-2012	11	0.30	0.000069	0.0032	0.00031	0.0078
MW09-03	3	17-Nov-2012	9.8	0.25	0.000023	0.0017	0.00041	0.0014
MW09-03	5	10-May-2012	<0.50	<0.020	<0.000010	0.00022	<0.0001	<0.0050
MW09-03	5	17-Nov-2012	<0.50	<0.020	<0.0000050	0.00011	<0.00004	0.00046
MW12-05	1	11-Nov-2012	350	0.37	0.00014	0.0074	0.00047	0.040
MW12-05	3	12-Nov-2012	460	0.030	0.00021	0.0022	0.00036	0.031
MW12-05	5	12-Nov-2012	46	0.82	0.000016	0.0015	0.00016	0.0066
MW12-05	7	12-Nov-2012	41	<0.020	<0.0000050	0.00048	0.00011	0.0054
MW12-06	2	16-Nov-2012	210	0.081	0.000016	0.00023	0.00014	0.011
MW12-06	4	16-Nov-2012	180	0.080	0.000012	0.00011	0.000083	0.0081
MW12-06	6	16-Nov-2012	170	0.45	0.000012	0.00026	0.00051	0.0031
MW12-07	1	3-Nov-2012	180	54	0.00063	0.077	0.035	0.064
MW12-07	2	3-Nov-2012	280	21	0.00027	0.022	0.015	0.039

\\VAN-SVR0\Projects\01\_SITES\Minto\1CM002.008\_Hydrogeology\_2012\080\_Deliverables\Hydrogeological Conceptual Model\020\_Tables

\*n/a - not available

## 5 Conclusions/Recommendations

The conceptual understanding of the Minto Mine site's hydrogeological system is reasonably well advanced. The topographical constraints on the groundwater flow system being imposed by the relief of the catchment provide a high degree of control of groundwater flow. This constraint allows for a high probability of predicting the major flow paths in the system. The topographic constraint also allows for a high degree of confidence in the placement of monitoring wells and surface water stations to assess potential impacts on the receiving waters.

### 5.1 Spatial Coverage

A key aspect of any monitoring plan is to ensure the system is designed to collect samples from all reasonable flow paths that could be carrying parameters of concern to a receiving body - in this case Lower Minto Creek.

Based on the review of the site layout and conceptual flows paths, which are presented both in map view (Figure 1) and section view (Figures 9 to 18), the current groundwater monitoring and surface water monitoring systems are considered to be appropriate for monitoring groundwater that may be impacted by mining and milling operations.

### 5.2 Temporal Coverage

For the most part, because the groundwater monitoring system has only been installed over the last several years, the temporal record of monitoring results is short. However, monitoring locations have been situated to collect data in a reasonable time period (i.e., situated close enough to a potential source to detect significant changes in parameters of concern within a reasonable time period, even if flow systems are moving slowly, as is expected at Minto Mine). As such, while the period of monitoring is still short, it is anticipated that any significant changes in groundwater chemistry related to mining operations will be detected in a timely fashion.

### 5.3 Adequacy of Groundwater Monitoring

Because the groundwater is not expected to have significant changes over short periods of time, the sampling can be conducted twice a year. One sampling event should be conducted around or just after freshet, as this time is expected to represent the recent effects of any loads mobilized during the melt. The second sampling event should be conducted in approximately late September or October, when groundwater chemistry is expected to be most concentrated due to reduced infiltration because of low precipitation at the end of summer/early autumn.

### 5.4 Numerical Modelling

At this time, SRK does not recommend carrying out detailed site-wide 3D numerical groundwater modelling. The current data for the site does not allow for a reasonable calibration to site hydrogeological conditions. The number of non-unique solutions would be too large to be of any real benefit for predicting groundwater movement over what can be inferred from routine hydrogeological theory and an understanding of the topography and subsurface conditions at the site.

The conceptual model has presented the available data and the current understanding of permafrost distribution. The monitoring wells present the opportunity to characterize groundwater at multiple points within the catchment with two wells, MW12-06 and MW12-05, near where the groundwater “exits” from the property. With these monitoring opportunities and with topography that lends itself to focussing the discharge point, numerical modelling does not present a better opportunity to increase comprehension of the flow regime.

This report, “Minto Mine Phase V/VI Expansion: Hydrogeological Characterization Report”, was prepared by SRK Consulting (Canada) Inc.

*“Original signed by Jennifer Adams”*

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Jennifer Adams, GIT (BC)  
Consultant (Hydrogeology)

and reviewed by

*“Original signed by Michael Royle”*

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Michael Royle, M.App.Sci., PGeo (BC, NT)  
Principal Consultant (Hydrogeology)

*“Original signed by Dylan MacGregor”*

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Dylan MacGregor, PGeo (BC)  
Principal Consultant (Geochemistry)

All data used as source material plus the text, tables, figures, and attachments of this document have been reviewed and prepared in accordance with generally accepted professional engineering and environmental practices.

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The opinions expressed in this report have been based on the information available to SRK at the time of preparation. SRK has exercised all due care in reviewing information supplied by others for use on this project. Whilst SRK has compared key supplied data with expected values, the accuracy of the results and conclusions from the review are entirely reliant on the accuracy and completeness of the supplied data. SRK does not accept responsibility for any errors or omissions in the supplied information, except to the extent that SRK was hired to verify the data.

## 6 References

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Figures

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384000

385000

386000

387000

6946000

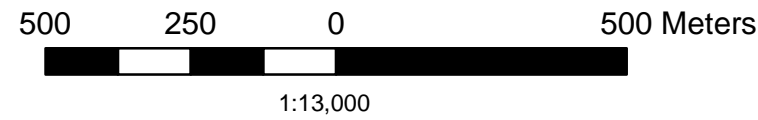
6945000

6944000



**Legend**

- + MP Well, Functional
- + MP Well, Non-functional
- + Piezometer with thermistor, Functional
- + Drivepoint, Functional
- Surface Water Monitoring
- Catchment Boundary



Notes:  
 1. Data presented in NAD 1983 UTM Zone 8N.  
 2. Base orthophoto provided by Minto Mine, August 2012.  
 3. Final pit designs provided by Minto Mine, October 2012.



Job No: 1CM002.008  
 Filename: Figure1\_SiteMap\_Minto\_1CM002.008\_rev02.mxd



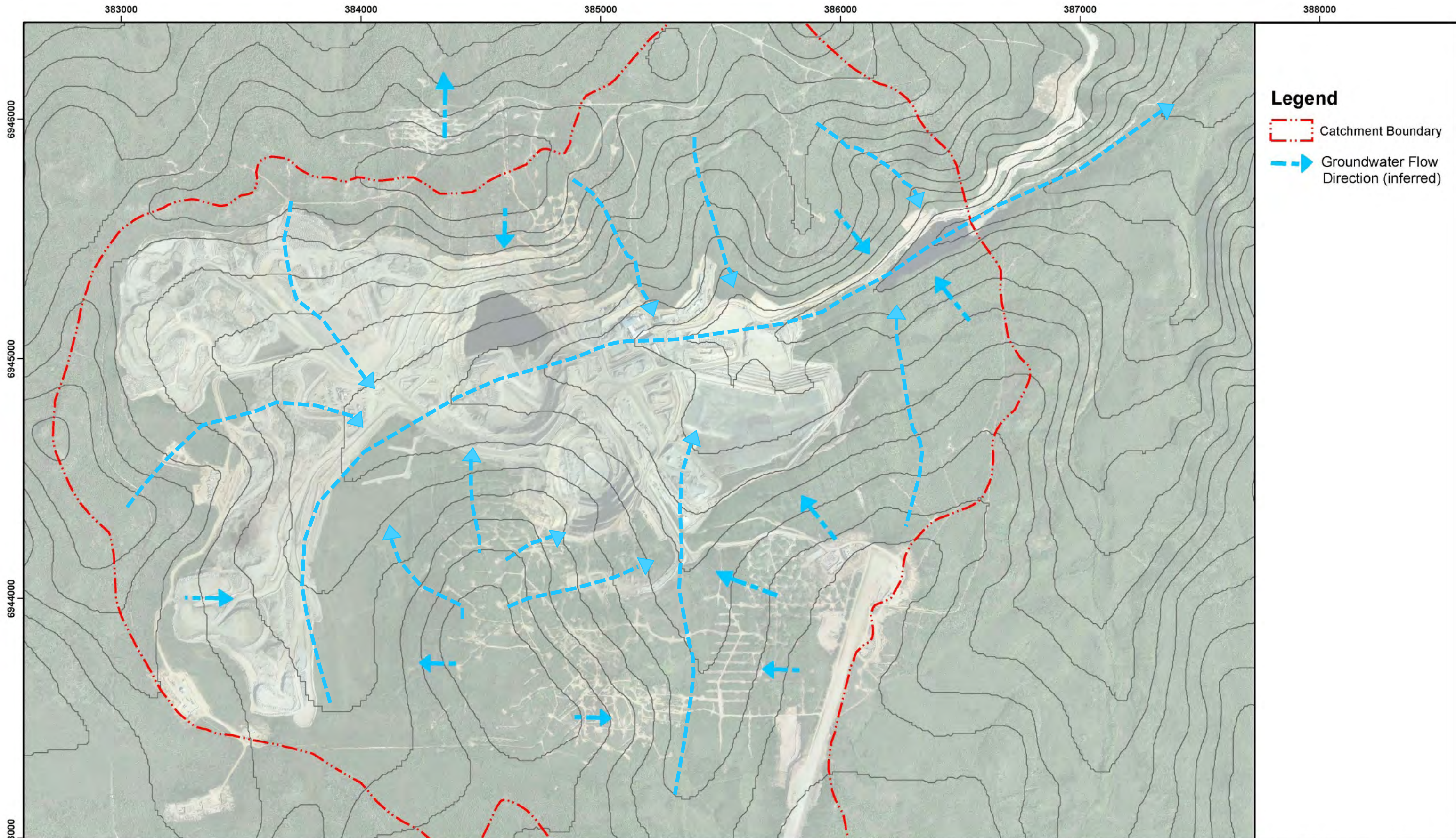
MINTO MINE

Phase V/VI Hydrogeological Characterization Report



**Site Map with Proposed Phase V/VI Pits**

Date: May 2013	Approved: JA	Figure: <b>1</b>
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**Legend**

-  Catchment Boundary
-  Groundwater Flow Direction (inferred)

N



500 250 0 500 Meters



1:15,000

Notes:  
 1. Data presented in NAD 1983 UTM Zone 8N.  
 2. Base orthophoto provided by Minto Mine, August 2012.  
 3. Contours are in 20 m intervals and represent pre-mining topography.



Job No: 1CM002.008  
 Filename: Fig2\_gwFlow\_Minto\_1CM002.008\_rev02.mxd

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Phase V/VI Hydrogeological Characterization Report		
Inferred Groundwater Flow Direction		
Date: May 2013	Approved: JA	Figure: <b>2</b>



383000

384000

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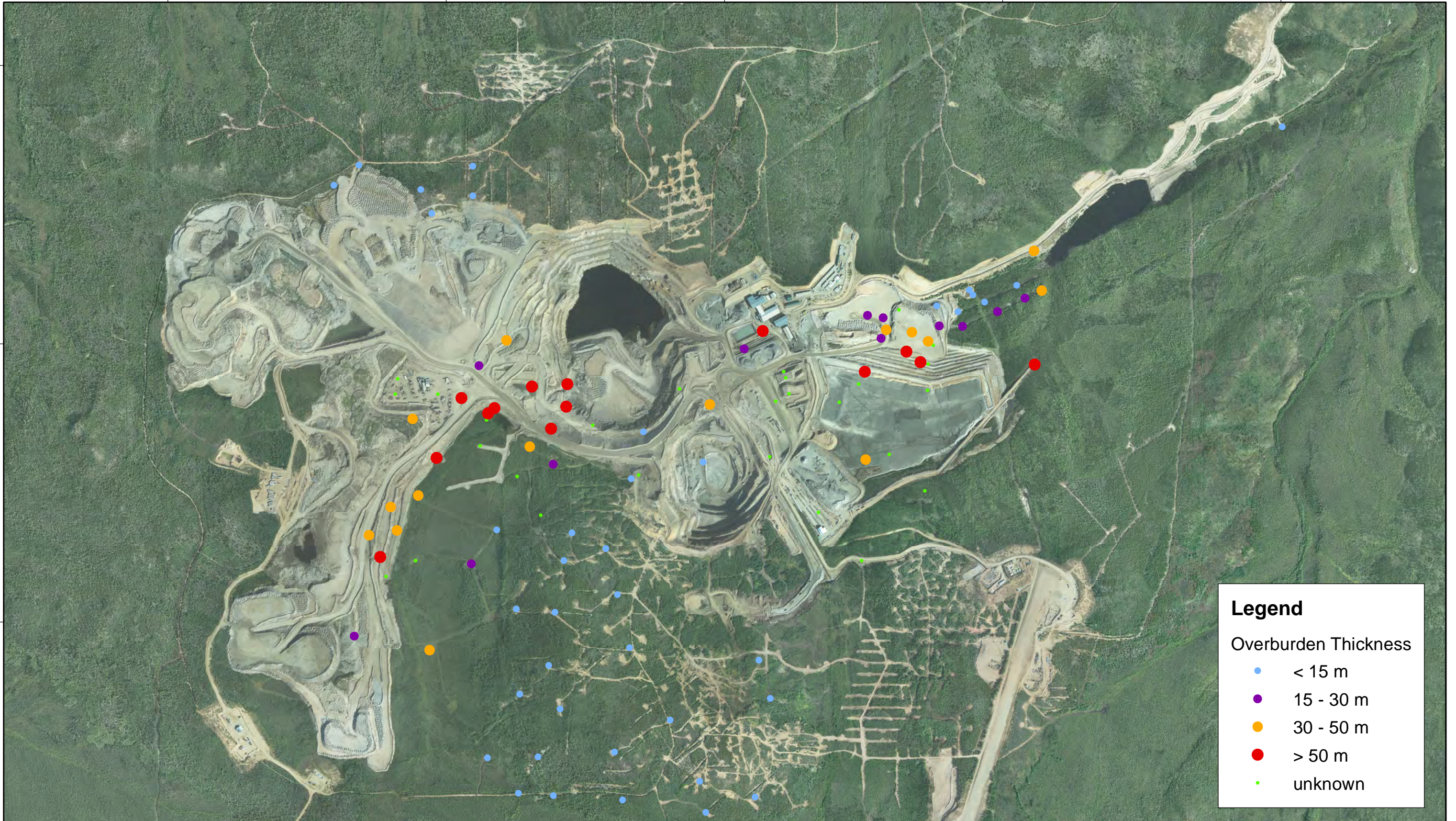
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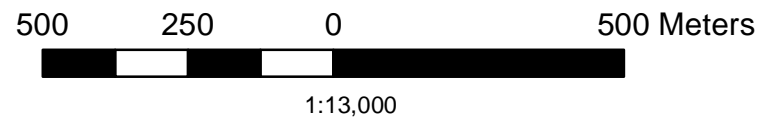
6944000



**Legend**

Overburden Thickness

- < 15 m
- 15 - 30 m
- 30 - 50 m
- > 50 m
- unknown



Notes:  
 1. Data presented in NAD 1983 UTM Zone 8N.  
 2. Base orthophoto provided by Minto Mine, August 2012.



Job No: 1CM002.008  
 Filename: Fig3\_OBdistribution\_Minto\_1CM002.008.mxd



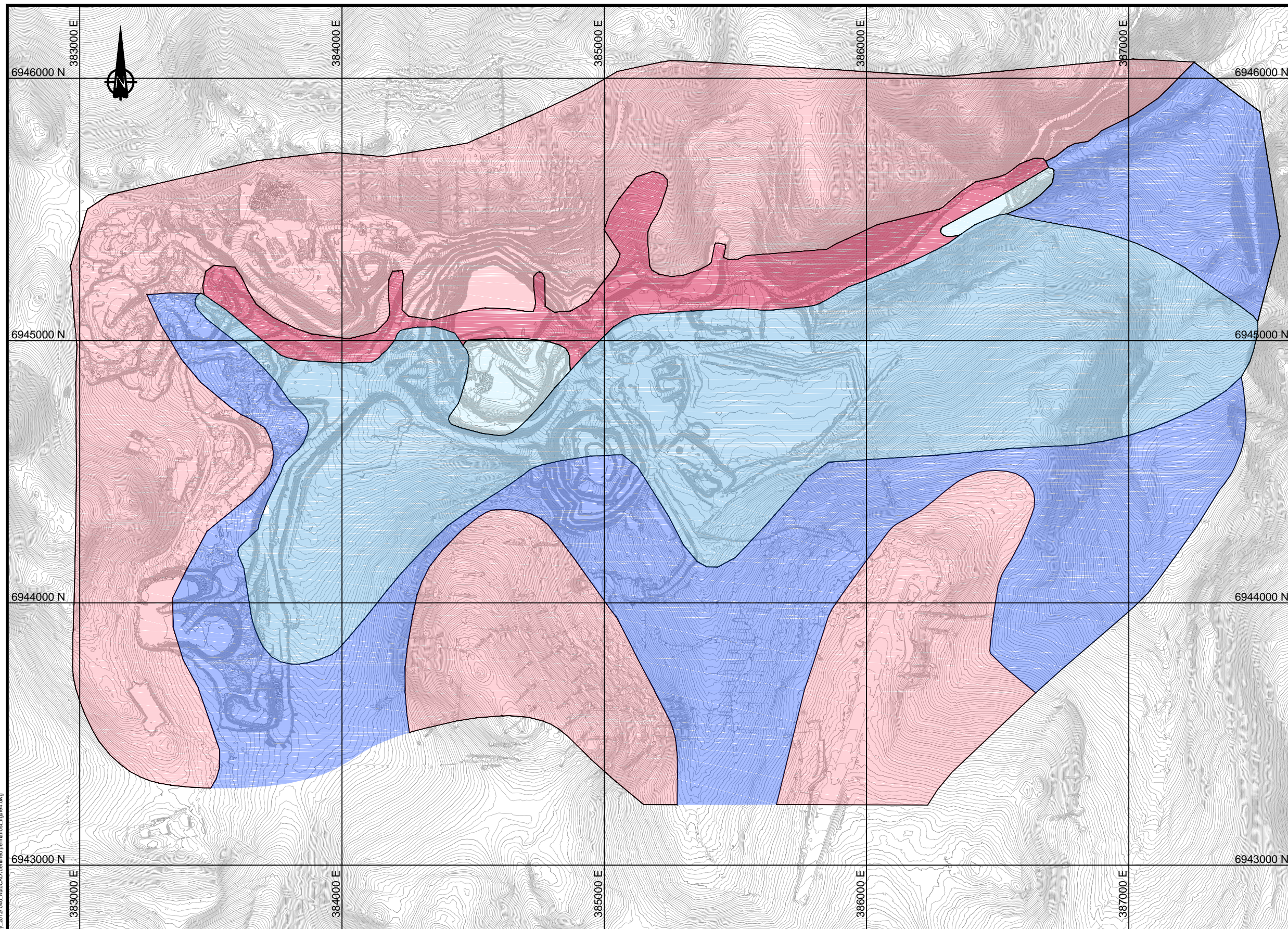
MINTO MINE

Phase V/VI Hydrogeological  
 Characterization Report

**OverburdenDrillhole  
 Distribution and Thickness**

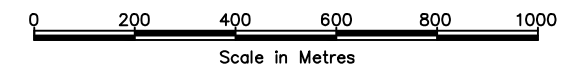
Date: May 2013	Approved: JA	Figure: <b>3</b>
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**LEGEND**

- Indicates zones containing permafrost and/or ice
- Indicates zones possibly containing permafrost and/or ice
- Indicates zones containing thawed permafrost and/or ice
- Indicates zones containing no permafrost and/or ice
- Indicates zones possibly containing no permafrost and/or ice



- NOTES**
1. Data presented in NAD 1983 UTM Zone 8N
  2. Topographic information provided by Minto Mine, August 2012
  3. Permafrost information provided by EBA, October 2011

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SRK JOB NO.: 1CM002.008.B1  
FILE NAME: Identified permafrost\_figure4.dwg

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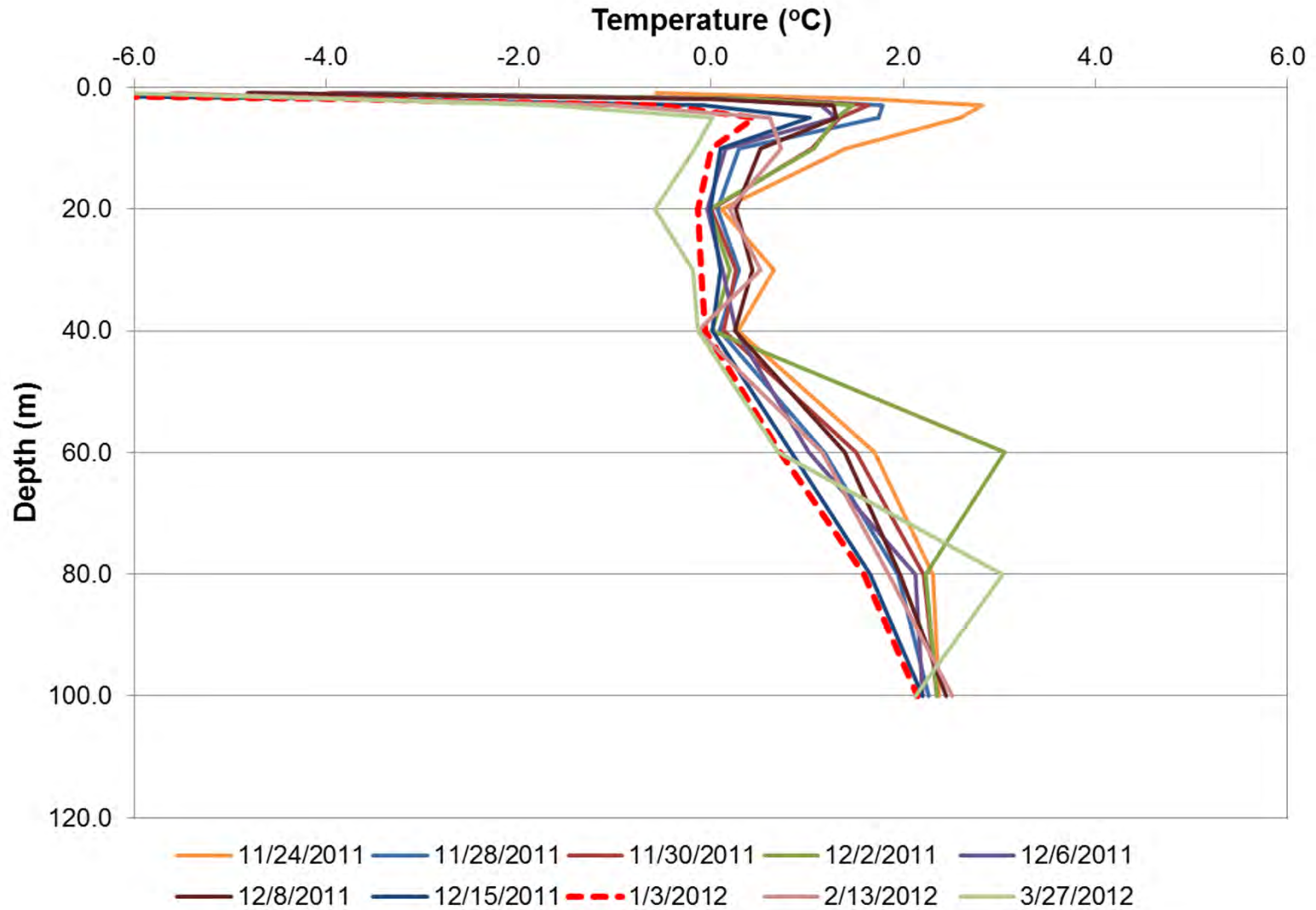
Minto Mine

Phase V/VI Hydrogeological Characterization Report		
<b>Site Plan Permafrost Distribution</b>		
DATE: May 2013	APPROVED: JA	FIGURE: 4

P:\L\_SITES\Minto\1CM002.008\_Hydrogeology\_2012\140\_AuscAD\Identified permafrost\_figures.dwg



# MW11-01A



Phase V/VI Hydrogeological  
Characterization Report

## Temperature Profile – MW11-01A

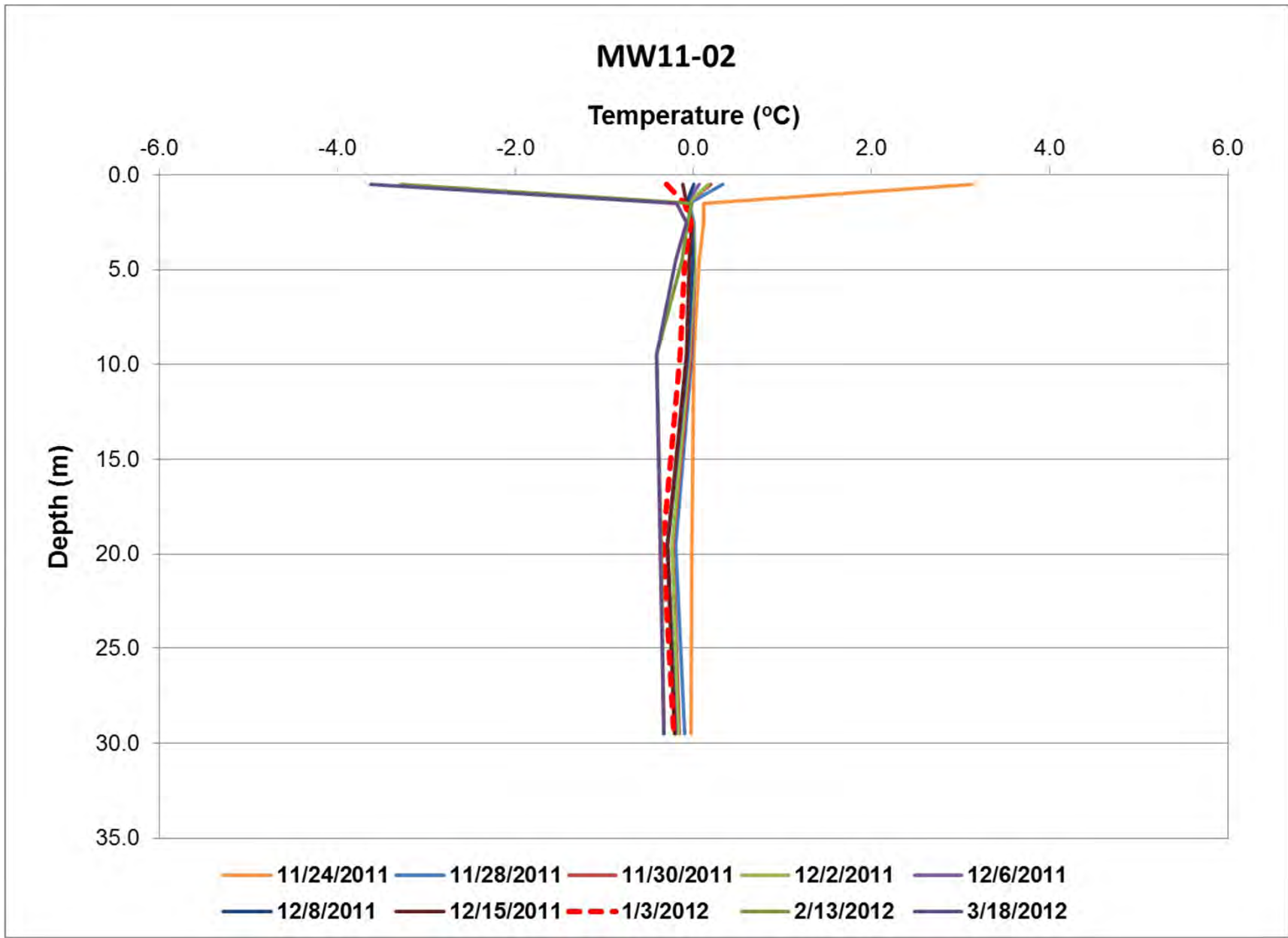
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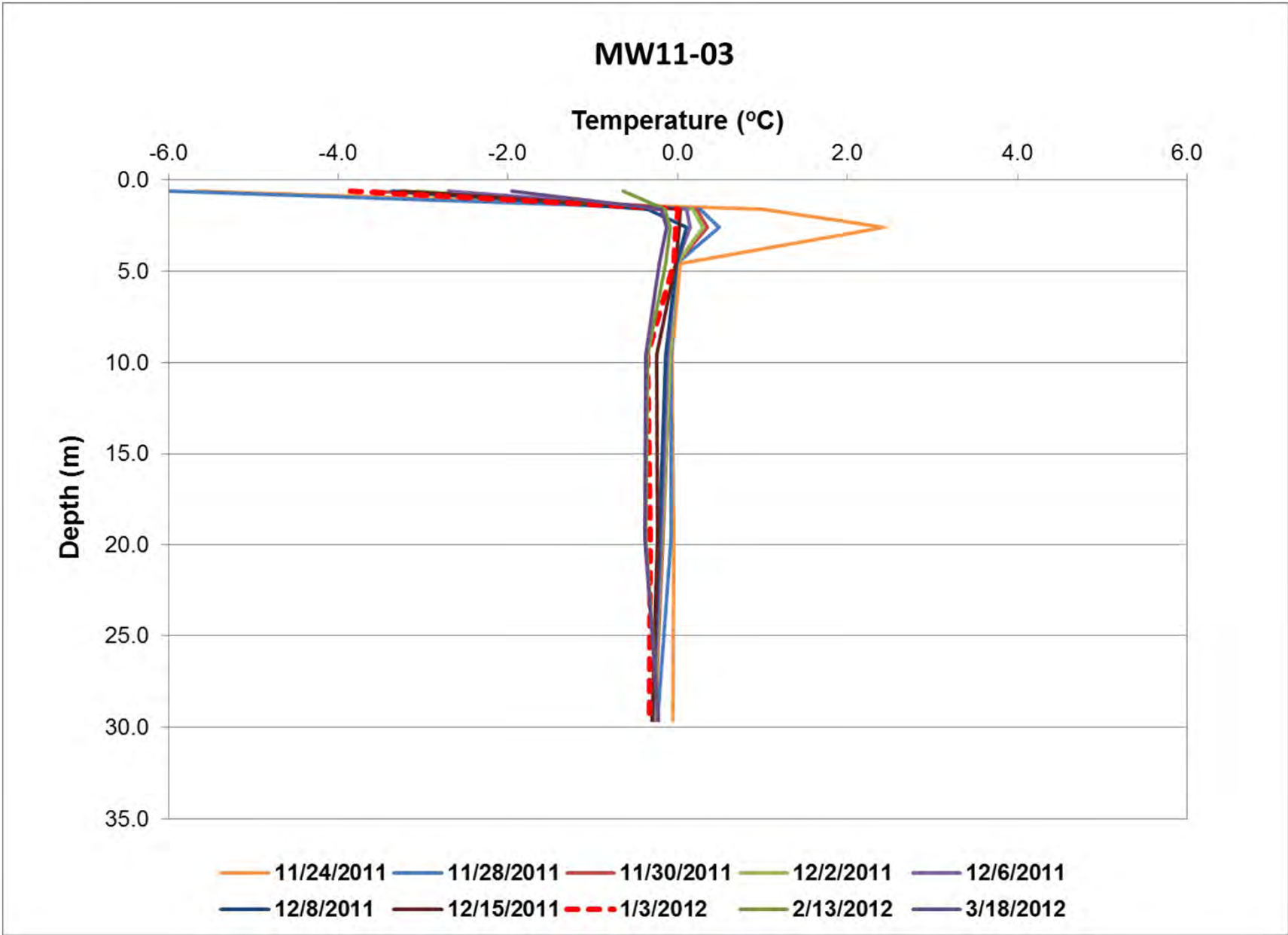
Minto Mine

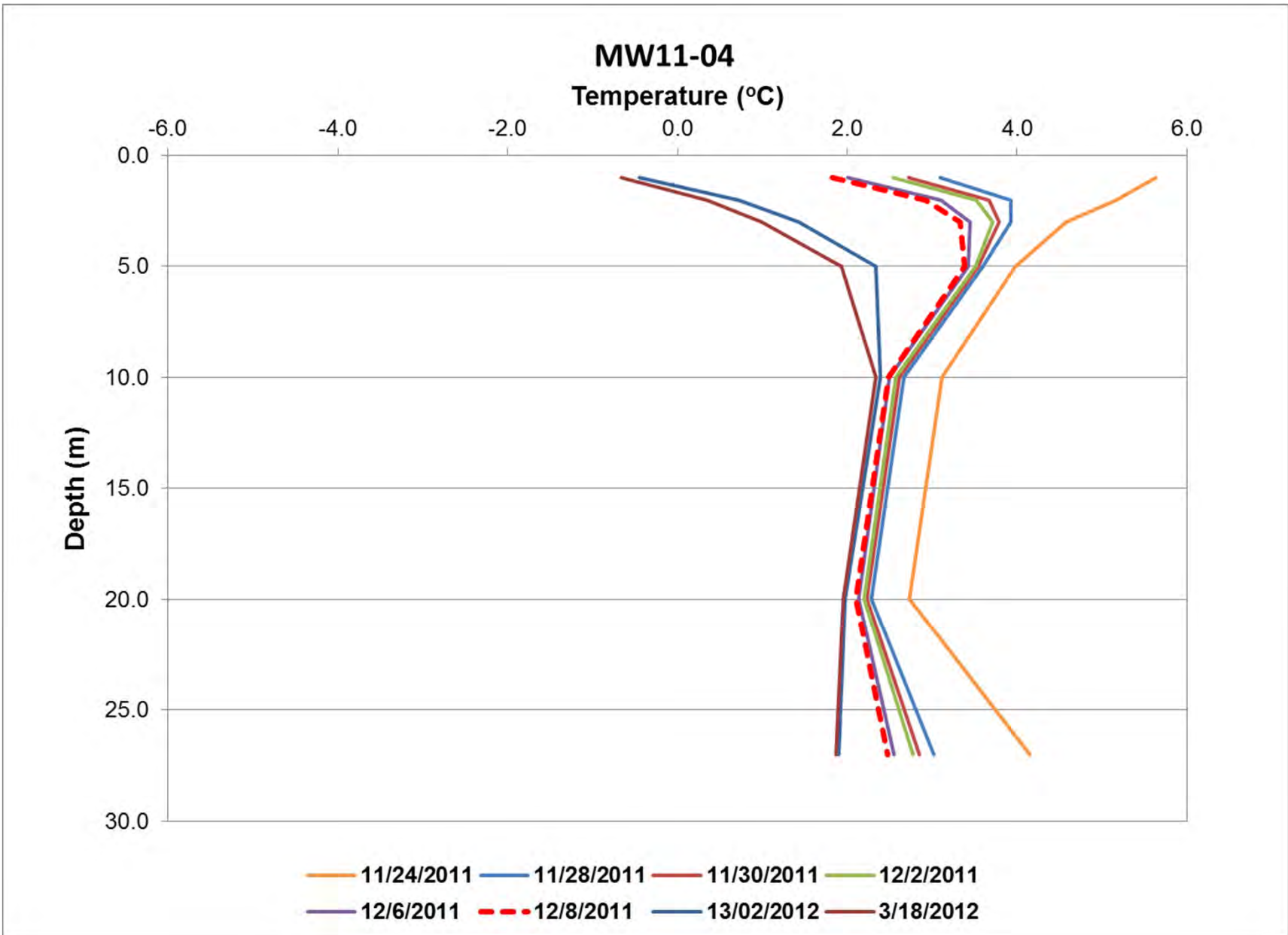
Date:  
May 2013

Approved:  
JA

Figure:  
**5**







Phase V/VI Hydrogeological  
Characterization Report

**Temperature Profile – MW11-04A**

Job No: 1CM002.008  
 Filename: Fig 5-8Temperature\_Profile\_Minto\_1CM002.008.pptx

Minto Mine

Date:  
May 2013

Approved:  
JA

Figure: **8**





**Legend**

- Monitoring Well
- Cross Section Line

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Job No: 1CM002.008.301  
 Filename: Fig9-19\_Minto\_crossSections\_V2\_1CM002.008.pptx

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 MINTO MINE  
OPERATED BY MINTO EXPLORATIONS LTD.

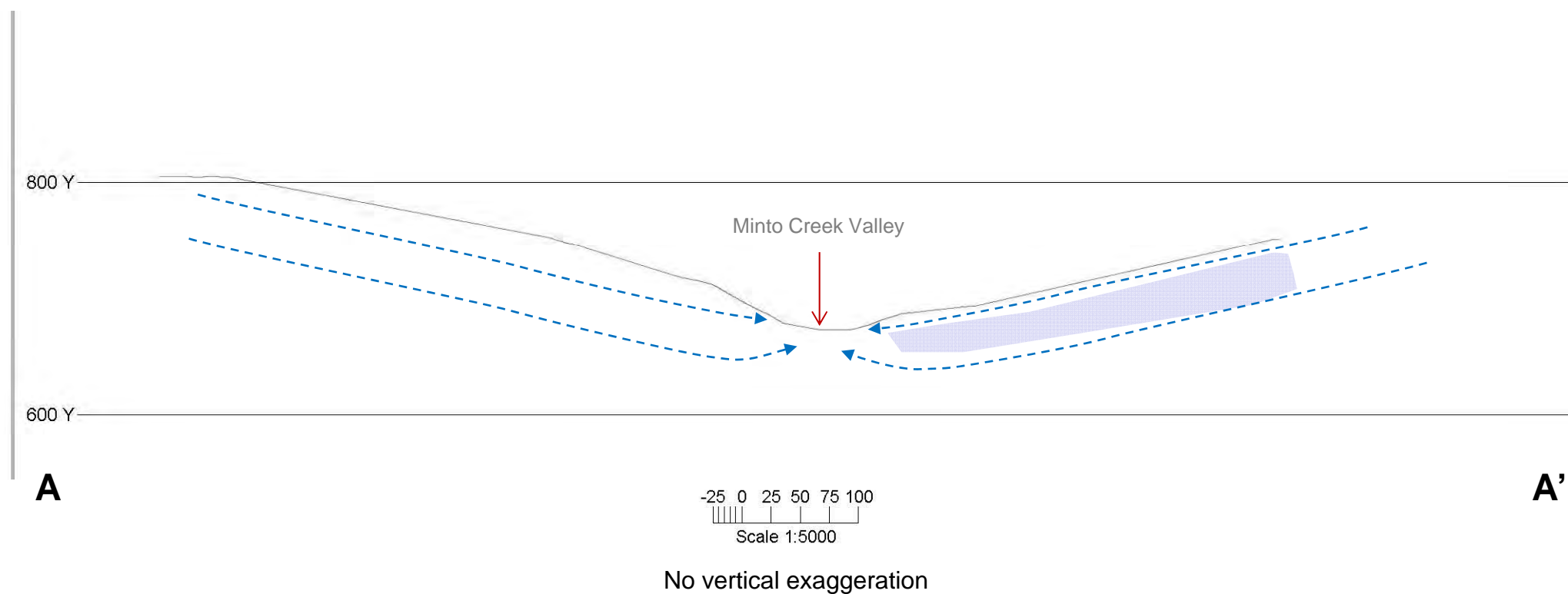
Minto Mine

Phase V/VI Hydrogeological Characterization Report

**Plan View of Section Lines**

Date: May 2013	Approved: JA	Figure: <b>9</b>
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**Notes:**

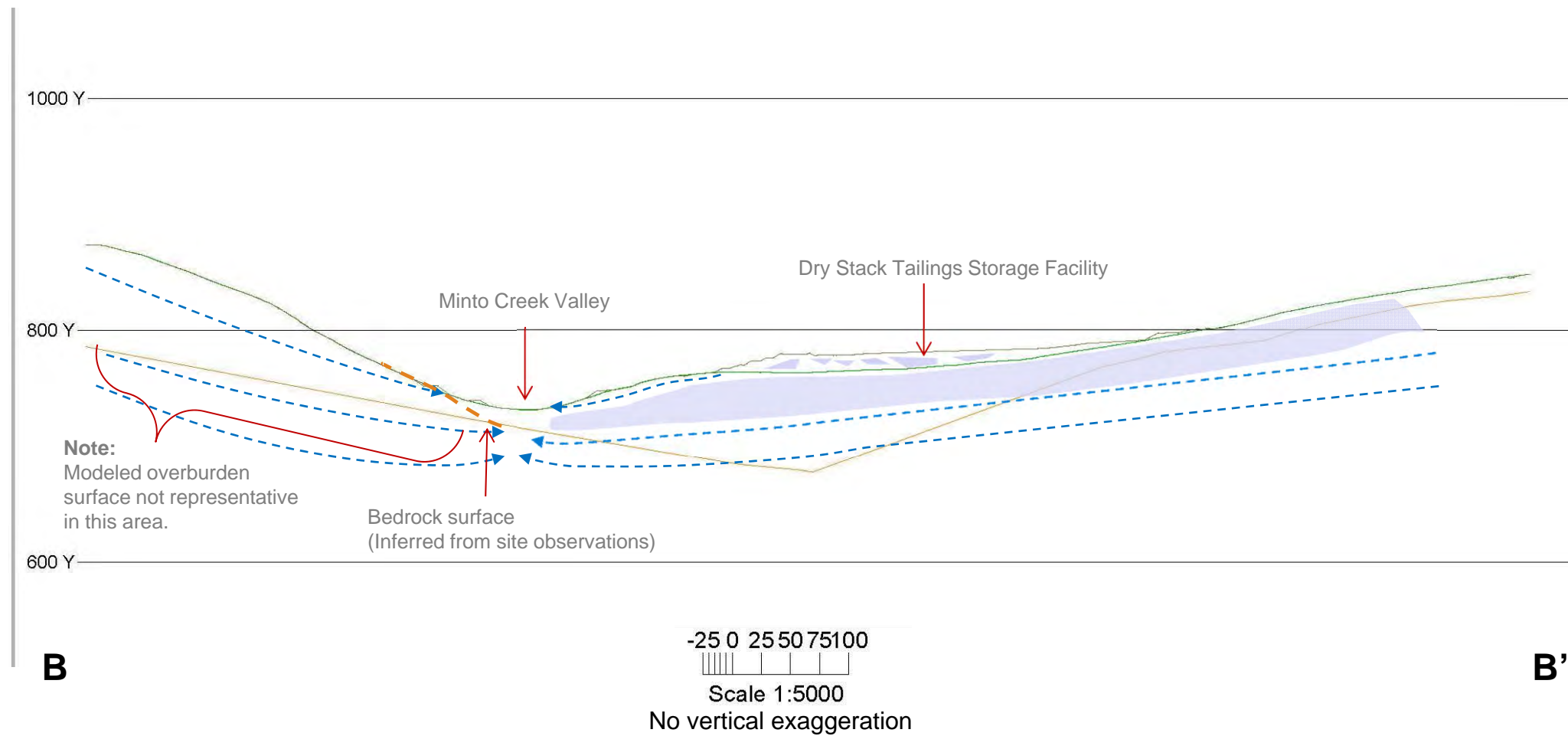
1. Original ground surface provided by Minto Mine.
2. Only original ground surface available for this area (no depth of overburden available). This part of the valley has not been significantly altered by the mine.
3. No data available for permafrost. Permafrost has been observed on north facing slopes and is reflected in this section due to the common geomorphologic and vegetation characteristics with known permafrost areas further west..

**Legend**

-  Current inferred permafrost (depth not to scale)
-  Current topography
-  Original Ground Surface
-  Bedrock surface (modeled)
-  Inferred groundwater pathway

		Phase V/VI Hydrogeological Characterization Report		
		<b>Section A-A'</b>		
Job No: 1CM002.008.301 Filename: Fig9-19_Minto_crossSections_V2_1CM002.008.pptx	Minto Mine	Date: May 2013	Approved: JA	Figure: <b>10</b>

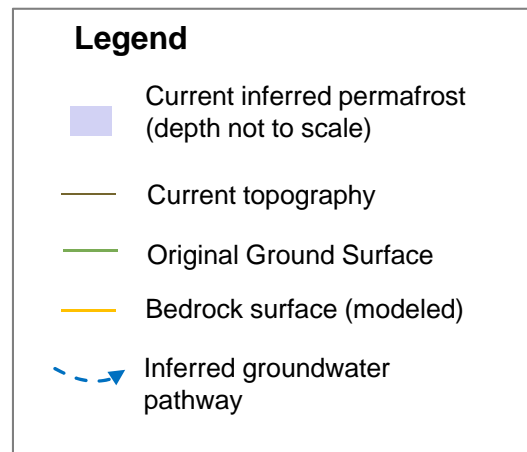
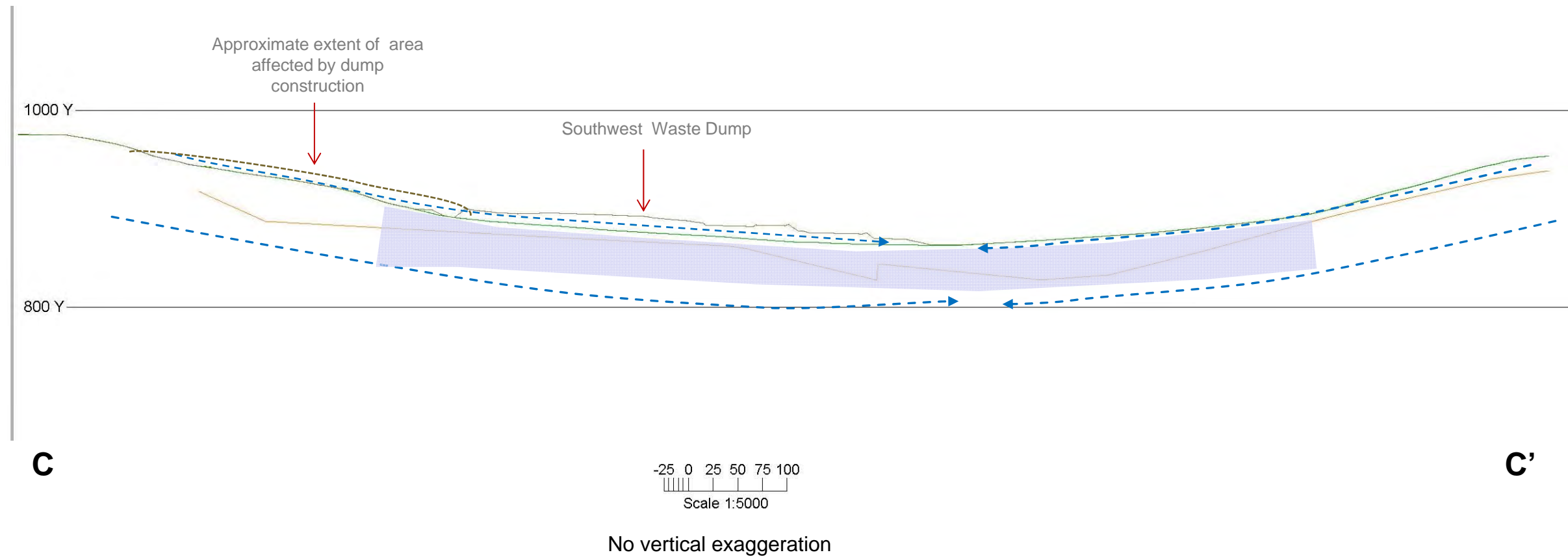




Legend	
	Current inferred permafrost (depth not to scale)
	Current topography
	Original Ground Surface
	Bedrock surface (modeled)
	Inferred groundwater pathway

- Notes:**
1. Topography data provided by Minto Mine in 2012.
  2. Original ground surface provided by Minto Mine.
  3. Bedrock surface modeled from drillhole data.

		Phase V/VI Hydrogeological Characterization Report		
		<b>Section B-B'</b>		
Job No: 1CM002.008.301 Filename: Fig9-19_Minto_crossSections_V2_1CM002.008.pptx	Minto Mine	Date: May 2013	Approved: JA	Figure: <b>11</b>



- Notes:**
1. Topography data provided by Minto Mine in 2012.
  2. Original ground surface provided by Minto Mine.
  3. Bedrock surface modeled from drillhole data.



Phase V/VI Hydrogeological Characterization Report

**Section C-C'**

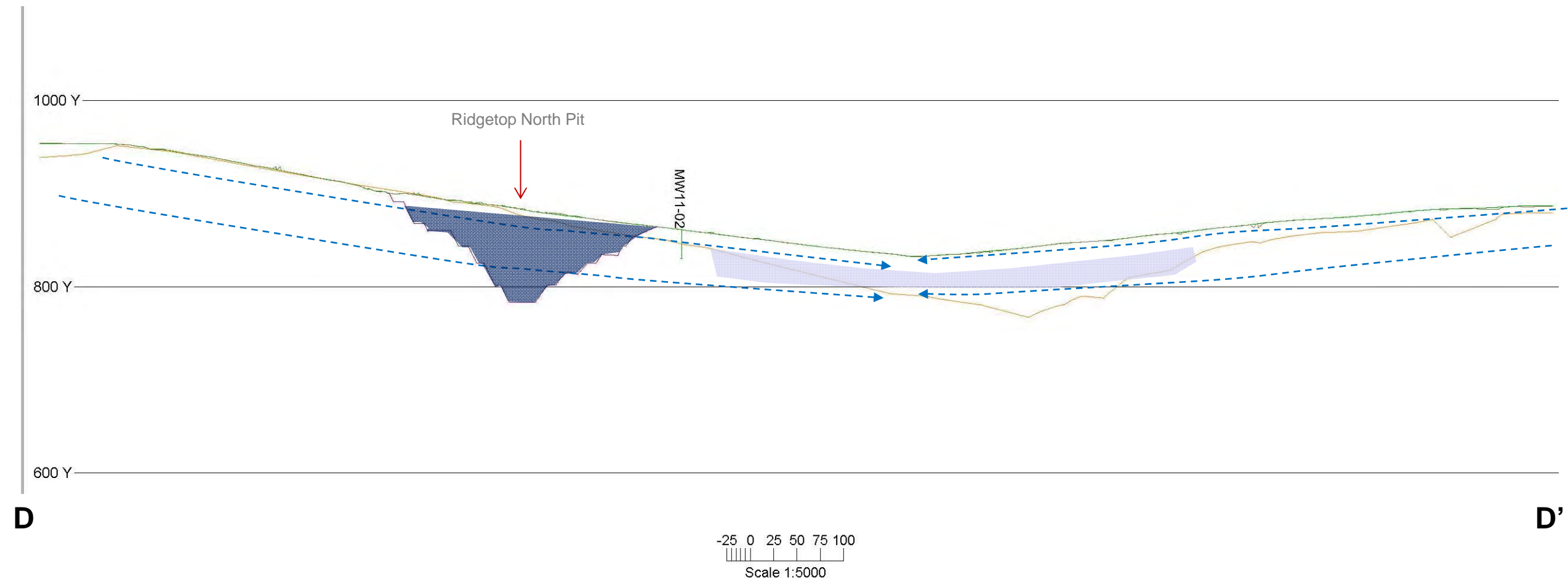
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Filename: Fig9-19\_Minto\_crossSections\_V2\_1CM002.008.pptx

Minto Mine

Date: May 2013

Approved: JA

Figure: 12



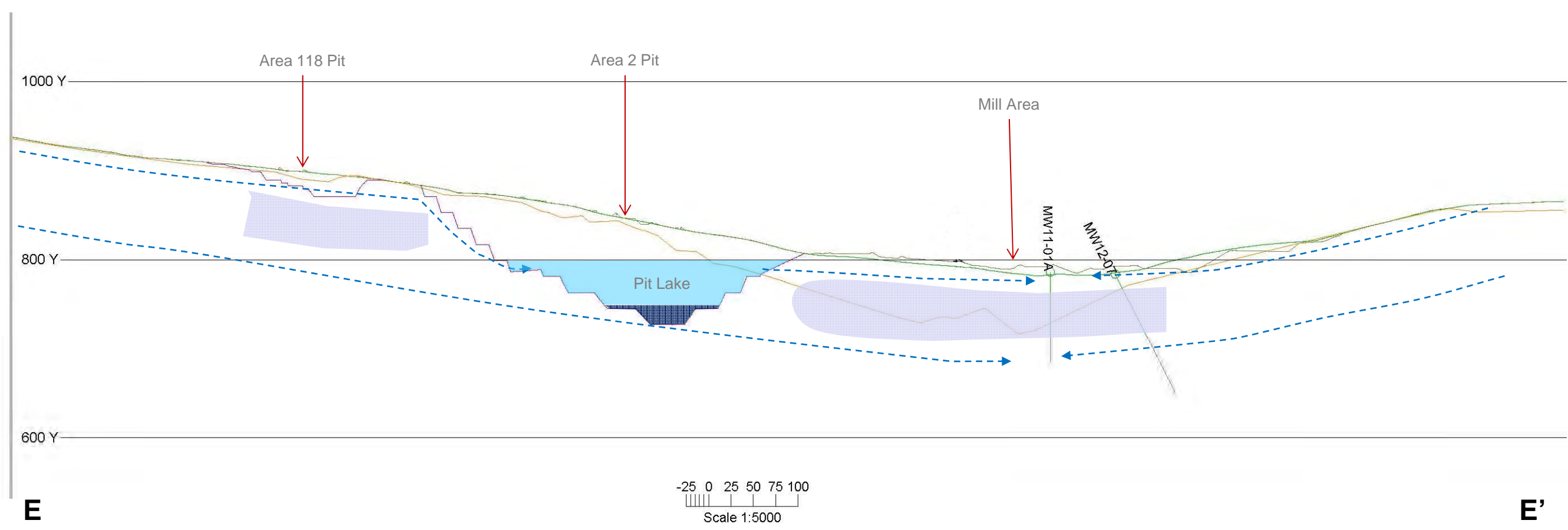
No vertical exaggeration

- Notes:**
1. Topography data provided by Minto Mine in 2012.
  2. Original ground surface provided by Minto Mine.
  3. Bedrock surface modeled from drillhole data.
  4. Groundwater inferred flow paths assume pits have flooded and reached static water levels.

**Legend**

- Current inferred permafrost (depth not to scale)
- Tailings
- Current topography
- Original Ground Surface
- Bedrock surface (modeled)
- Inferred groundwater pathway

		Phase V/VI Hydrogeological Characterization Report		
		<b>Section D-D'</b>		
Job No: 1CM002.008.301 Filename: Fig9-19_Minto_crossSections_V2_1CM002.008.pptx	Minto Mine	Date: May 2013	Approved: JA	Figure: <b>13</b>



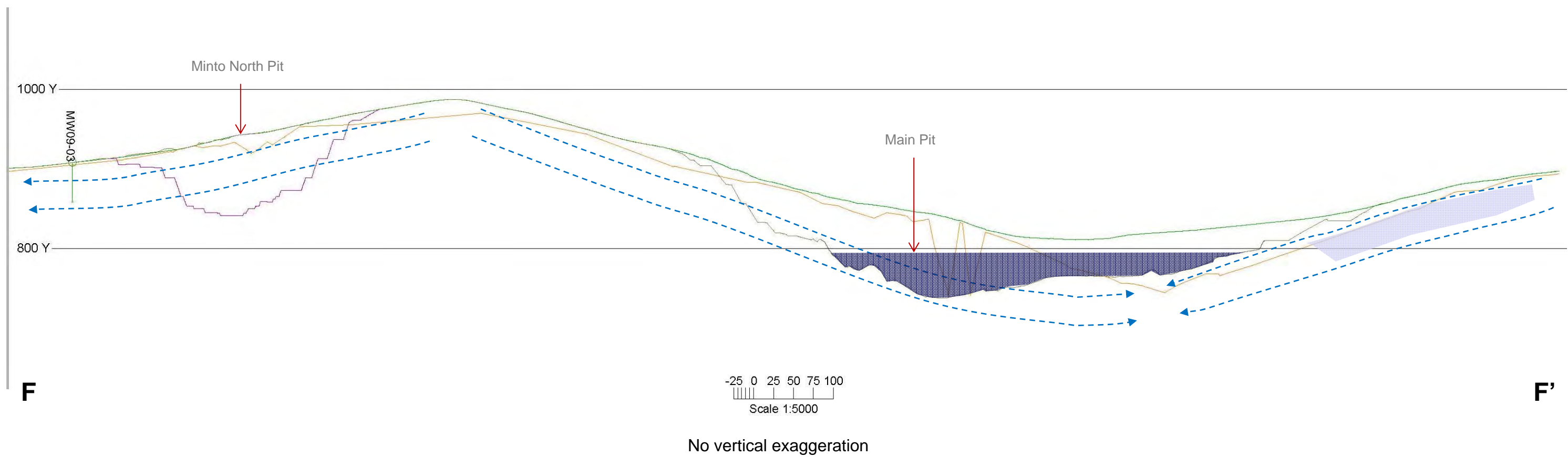
No vertical exaggeration

- Notes:**
1. Topography data provided by Minto Mine in 2012.
  2. Original ground surface provided by Minto Mine.
  3. Bedrock surface modeled from drillhole data.
  4. Groundwater inferred flow paths assume pits have flooded and reached static water levels.







**Legend**

- Current inferred permafrost (depth not to scale)
- Tailings
- Current topography
- Original Ground Surface
- Bedrock surface (modeled)
- Inferred groundwater pathway

		Phase V/VI Hydrogeological Characterization Report		
		Section E-E'		
Job No: 1CM002.008.301 Filename: Fig9-19_Minto_crossSections_V2_1CM002.008.pptx	Minto Mine	Date: May 2013	Approved: JA	Figure: <b>14</b>



### Legend

-  Current inferred permafrost (depth not to scale)
-  Tailings
-  Current topography
-  Original Ground Surface
-  Bedrock surface (modeled)
-  Inferred groundwater pathway

- Notes:**
1. Topography data provided by Minto Mine in 2012.
  2. Original ground surface provided by Minto Mine.
  3. Bedrock surface modeled from drillhole data. Bedrock surface through the Main Pit is not representative of site conditions.
  4. Groundwater inferred flow paths assume pits have flooded and reached static water levels.





Phase V/VI Hydrogeological  
Characterization Report

**Section F-F'**

Job No: 1CM002.008.301  
Filename: Fig9-19\_Minto\_crossSections\_V2\_1CM002.008.pptx

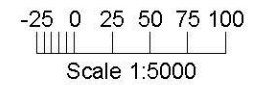
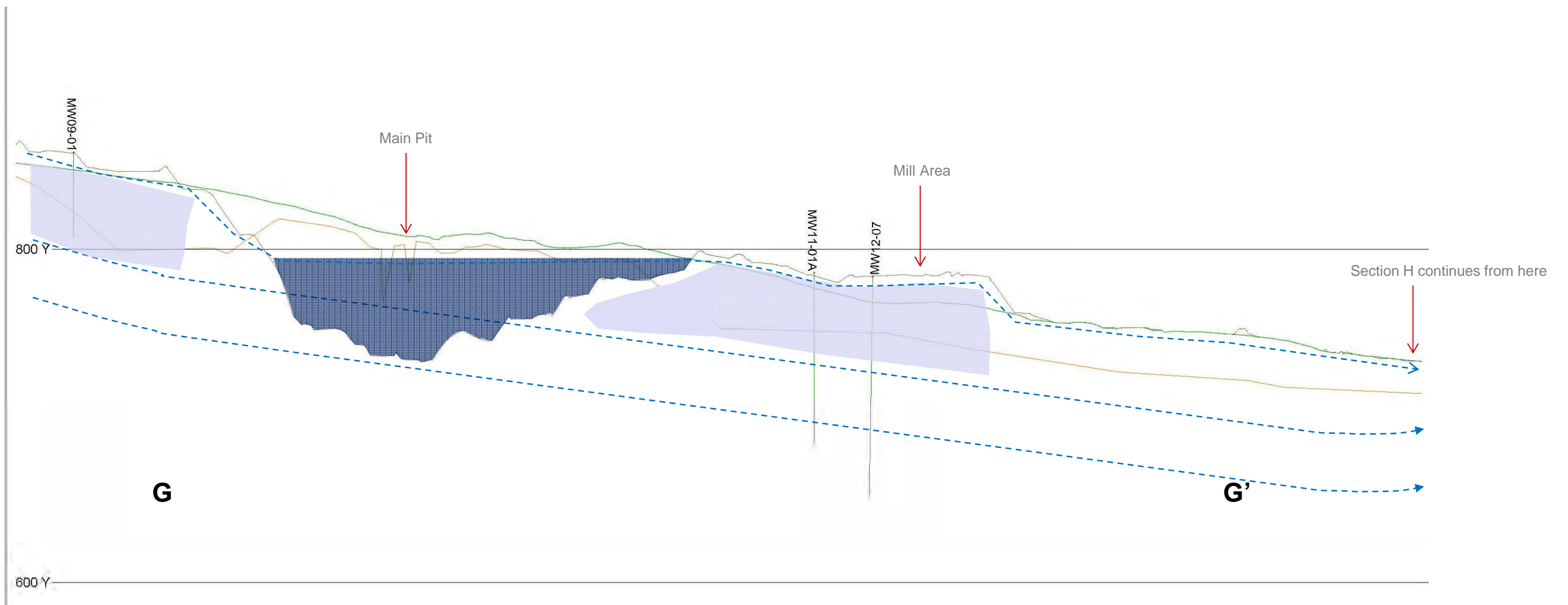
Minto Mine

Date:  
May 2013

Approved:  
JA

Figure: **15**





2x vertical exaggeration

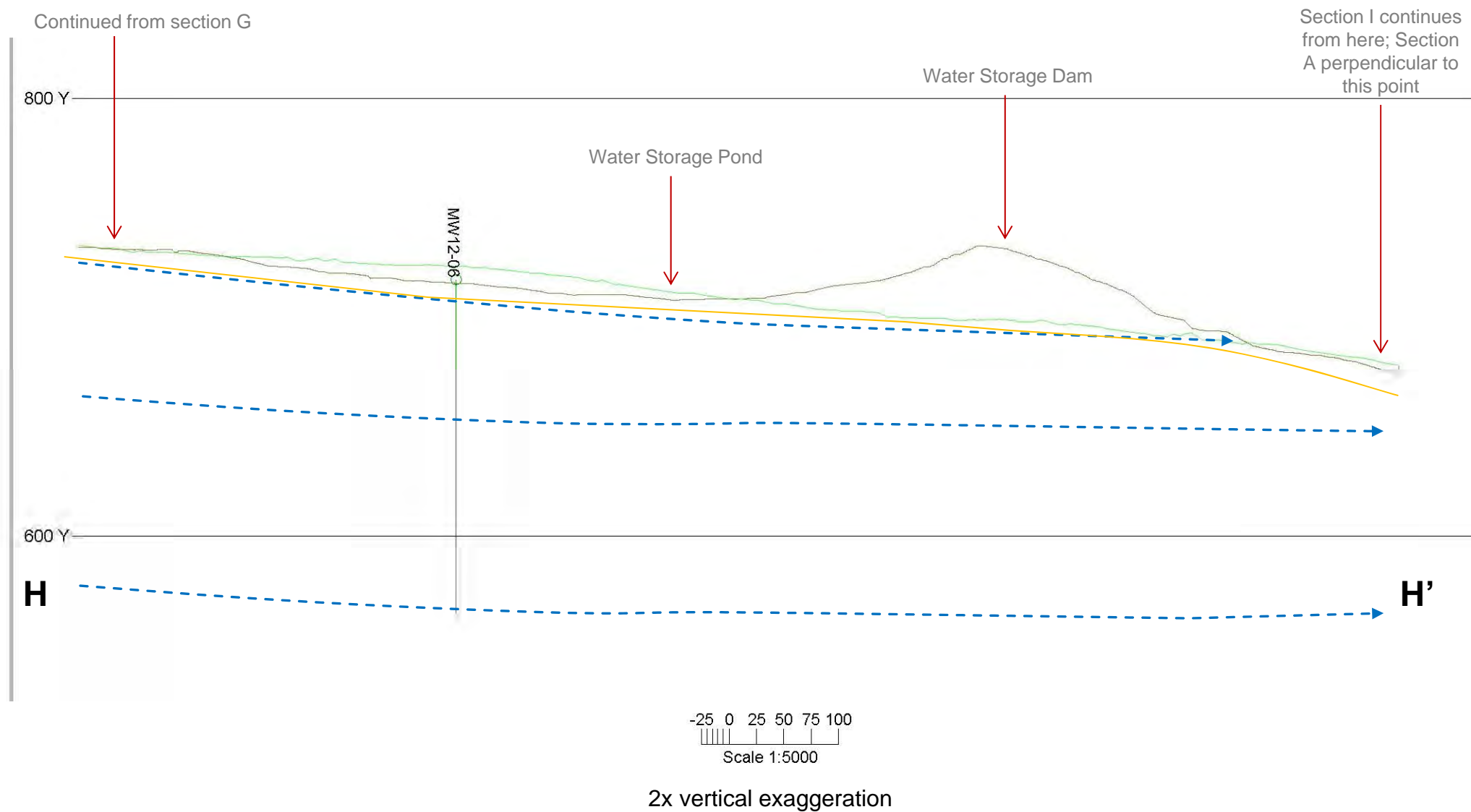
**Legend**

- Current inferred permafrost (depth not to scale)
- Tailings
- Current topography
- Original Ground Surface
- Bedrock surface (modeled)
- Inferred groundwater pathway

- Notes:**
1. Topography data provided by Minto Mine in 2012.
  2. Bedrock surface modeled from drillhole data.
  3. Original ground surface provided by Minto Mine.
  4. Groundwater inferred flow paths assume pits have flooded and reached static water levels.
  5. Section is near permafrost boundary.

		Phase V/VI Hydrogeological Characterization Report		
		<b>Section G-G'</b>		
Job No: 1CM002.008.301 Filename: Fig9-19_Minto_crossSections_V2_1CM002.008.pptx	Minto Mine	Date: May 2013	Approved: JA	Figure: <b>16</b>





**Legend**

- Current inferred permafrost (depth not to scale)
- Current topography
- Original Ground Surface
- Bedrock surface (modeled)
- Inferred groundwater pathway

**Notes:**

1. Topography data provided by Minto Mine in 2012.
2. Original ground surface provided by Minto Mine.
3. Bedrock surface modeled from drill hole data.
4. Water storage pond footprint is expected to remain saturated (e.g. wetlands) post closure.



Phase V/VI Hydrogeological Characterization Report

**Section H-H'**

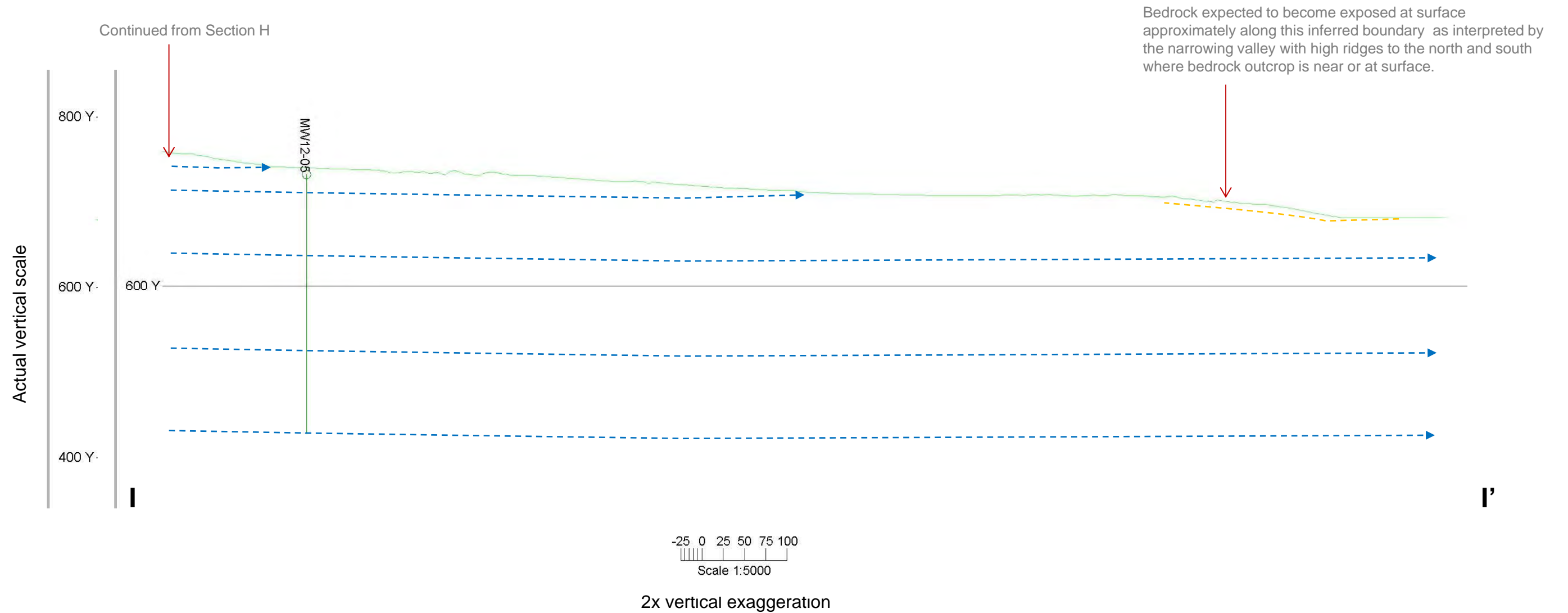
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Filename: Fig9-19\_Minto\_crossSections\_V2\_1CM002.008.pptx

Minto Mine

Date: May 2013

Approved: JA

Figure: 17



Legend	
	Current inferred permafrost (depth not to scale)
	Current topography
	Original Ground Surface
	Bedrock surface (modeled)
	Inferred groundwater pathway

**Notes:** 1. Only original ground surface available for this section. Provided by Minto Mine.

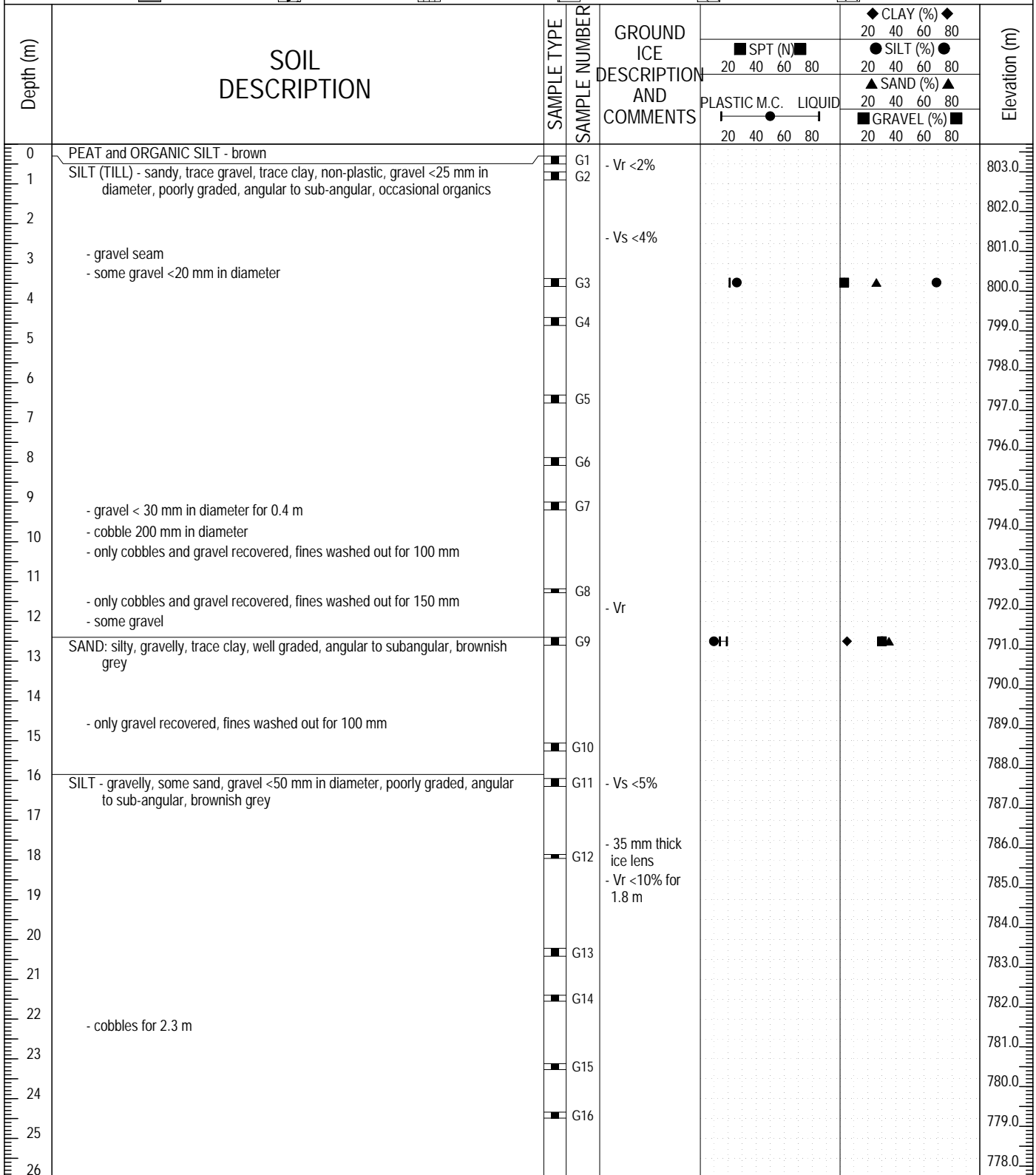
		Phase V/VI Hydrogeological Characterization Report		
		<b>Section I-I'</b>		
Job No: 1CM002.008.301 Filename: Fig9-19_Minto_crossSections_V2_1CM002.008.pptx	Minto Mine	Date: May 2013	Approved: JA	Figure: <b>18</b>


## Appendix A: Drill Hole Logs

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Winter 2011 Geotechnical Drilling	CLIENT: Minto Explorations Ltd.	BOREHOLE NO: 11-G03
Area 2 Open Pit	DRILL: 3000 Diamond Drill, HQ Core	PROJECT NO: W14101068.033
Minto Mine, YT	6944782.093N; 384948.312E; Zone 8	ELEVATION: 803.697m

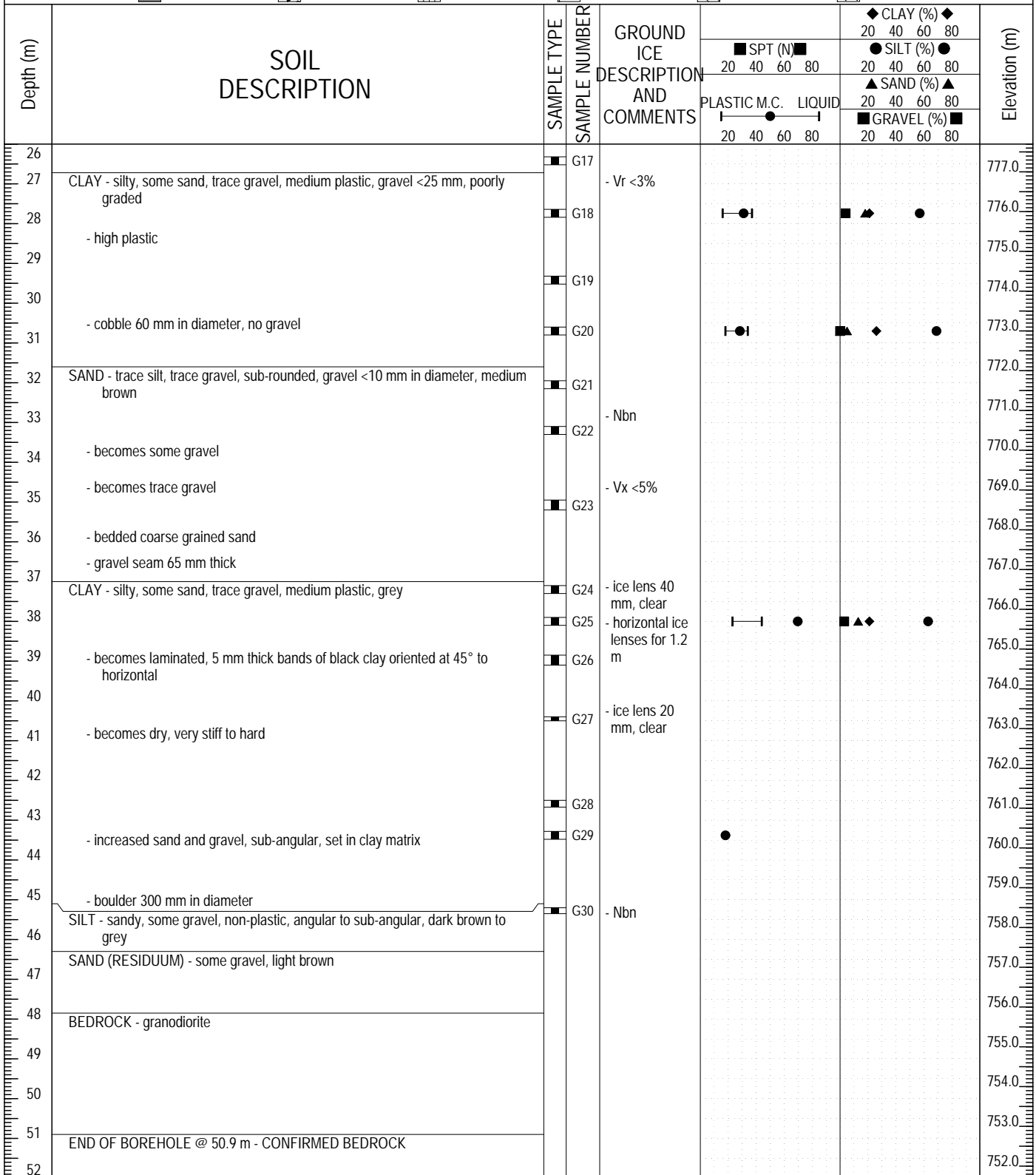
SAMPLE TYPE	GRAB SAMPLE	NO RECOVERY	BULK	CRREL CORE	SHELBY TUBE	GRAB CORE
BACKFILL TYPE	BENTONITE	PEA GRAVEL	SLOUGH	GROUT	DRILL CUTTINGS	SAND





	LOGGED BY: AT & SMC	COMPLETION DEPTH: 50.9m
	REVIEWED BY: JGD	COMPLETE: 1/18/2011
	DRAWING NO:	Page 1 of 2

Winter 2011 Geotechnical Drilling	CLIENT: Minto Explorations Ltd.	BOREHOLE NO: 11-G03
Area 2 Open Pit	DRILL: 3000 Diamond Drill, HQ Core	PROJECT NO: W14101068.033
Minto Mine, YT	6944782.093N; 384948.312E; Zone 8	ELEVATION: 803.697m

SAMPLE TYPE	GRAB SAMPLE	NO RECOVERY	BULK	CRREL CORE	SHELBY TUBE	GRAB CORE
BACKFILL TYPE	BENTONITE	PEA GRAVEL	SLOUGH	GROUT	DRILL CUTTINGS	SAND



	LOGGED BY: AT & SMC	COMPLETION DEPTH: 50.9m
	REVIEWED BY: JGD	COMPLETE: 1/18/2011
	DRAWING NO:	Page 2 of 2

Winter 2011 Geotechnical Drilling		CLIENT: Minto Explorations Ltd.		BOREHOLE NO: 11-G04							
Area 2 Open Pit		DRILL: 3000 Diamond Drill, HQ Core		PROJECT NO: W14101068.033							
Minto Mine, YT		6944576.52N; 384922.911E; Zone 8		ELEVATION: 836.303m							
SAMPLE TYPE		GRAB SAMPLE	NO RECOVERY	BULK	CRREL CORE	SHELBY TUBE	GRAB CORE				
BACKFILL TYPE		BENTONITE	PEA GRAVEL	SLOUGH	GROUT	DRILL CUTTINGS	SAND				
Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	SPT (N)		PLASTIC M.C.		LIQUID		Elevation (m)
					20	40	60	80	20	40	
0	SAND - silty, some gravel, light brown, organics - organic layer 150 mm thick			- Vx <15%							836.0
1	SILT - some sand, trace clay, faint organic smell		G1	- Nbn							835.0
2				- ice lens 100 mm, cloudy, porous							834.0
3	SAND (RESIDUUM) - some silt, some gravel, <20 mm in diameter		G2	- Vx <50%							833.0
4			G3								832.0
5	BEDROCK										831.0
6											830.0
7											829.0
8											828.0
9	END OF BOREHOLE @ 8.2 m - CONFIRMED BEDROCK										827.0
10											
				LOGGED BY: AT & SMC		COMPLETION DEPTH: 8.23m					
				REVIEWED BY: JGD		COMPLETE: 1/18/2011					
				DRAWING NO:		Page 1 of 1					



Winter 2010 Instrumentation Program		Minto Explorations Ltd.		BOREHOLE NO: 10-DSI-1								
Dry Stack Tailings Storage Facility		Driftwood 3000 Diamond Drill-HQ Core		PROJECT NO: W14101068.001								
Minto Mine, YT		6945021.46N; 385563.531E; Zone 8		ELEVATION: 764.784m								
SAMPLE TYPE		<input checked="" type="checkbox"/> GRAB SAMPLE	<input type="checkbox"/> NO RECOVERY	<input checked="" type="checkbox"/> BULK	<input type="checkbox"/> CRREL CORE	<input type="checkbox"/> SHELBY TUBE	<input checked="" type="checkbox"/> GRAB CORE					
BACKFILL TYPE		<input checked="" type="checkbox"/> BENTONITE	<input type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input type="checkbox"/> SAND					
Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density(kg/m <sup>3</sup> )		PLASTIC M.C.		LIQUID		Slope Indicator	Elevation (m)
					20	40	60	80	20	40		
0	WASTE ROCK FILL											764.0
1												763.0
2												762.0
3												761.0
4												760.0
5												759.0
6												758.0
7												757.0
8												756.0
9	SILT (TILL): gravelly, sandy, trace clay, dark grey			- Nbn								755.0
10	- no gravel present		G1	- Nbn								754.0
11			G2									753.0
12	- some clay, trace sand			- Nbn								752.0
13			G3	- Vs, 5-10 mm thick ice lenses irregularly spaced 200-300 mm								751.0
14				- Nbn								750.0
15	CLAY and SILT: trace sand, trace gravel, medium plastic, dark grey		G4	- 50 mm thick ice lens								750.0



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REVIEWED BY: JPB	COMPLETE: 1/25/2010
DRAWING NO:	Page 1 of 3

Winter 2010 Instrumentation Program		Minto Explorations Ltd.		BOREHOLE NO: 10-DSI-1								
Dry Stack Tailings Storage Facility		Driftwood 3000 Diamond Drill-HQ Core		PROJECT NO: W14101068.001								
Minto Mine, YT		6945021.46N; 385563.531E; Zone 8		ELEVATION: 764.784m								
SAMPLE TYPE		GRAB SAMPLE	NO RECOVERY	BULK	CRREL CORE	SHELBY TUBE	GRAB CORE					
BACKFILL TYPE		BENTONITE	PEA GRAVEL	SLOUGH	GROUT	DRILL CUTTINGS	SAND					
Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density(kg/m <sup>3</sup> )		CLAY (%)	SILT (%)	SAND (%)	GRAVEL (%)	Slope Indicator	Elevation (m)
					PLASTIC M.C.	LIQUID						
15			G5	- Vx, 5-10% - Vs, 5-10 mm thick ice lenses irregularly spaced 200-400 mm								749.0
16			G6	- Nbn - Nbe								748.0
17			G7	- Nbn								747.0
18			G8	- Nbn - Vx, 15-20% - Vs, 5-10 mm thick ice lenses, irregularly spaced 200-300 mm								746.0
19			G9									745.0
20			G10									744.0
21			G11	- Nbe - Vx, 5-10% - Vs, 10-30 mm thick ice lenses, irregularly spaced 300-350 mm								743.0
22			G12									742.0
23			G13									741.0
24			G14	- Nbe - Vr < 45%, lenses 10-20 mm thick - Vx, 10% - Vc < 5%								740.0
25	- at 24.3 m cobble - some gravel, fine to medium grained											739.0
26												738.0
27	- gravel, coarse grained, < 40 mm											737.0
28	BEDROCK: poor quality, weathered, moderately friable orangy brown											736.0
29												735.0
30												735.0



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DRAWING NO:

COMPLETION DEPTH: 43.3m

COMPLETE: 1/25/2010

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Winter 2010 Instrumentation Program		Minto Explorations Ltd.		BOREHOLE NO: 10-DSI-1				
Dry Stack Tailings Storage Facility		Driftwood 3000 Diamond Drill-HQ Core		PROJECT NO: W14101068.001				
Minto Mine, YT		6945021.46N; 385563.531E; Zone 8		ELEVATION: 764.784m				
SAMPLE TYPE		GRAB SAMPLE	NO RECOVERY	BULK	CRREL CORE	SHELBY TUBE	GRAB CORE	
BACKFILL TYPE		BENTONITE	PEA GRAVEL	SLOUGH	GROUT	DRILL CUTTINGS	SAND	
Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density(kg/m <sup>3</sup> )		Slope Indicator	Elevation (m)
					PLASTIC M.C.	LIQUID		
					20 40 60 80	20 40 60 80		
					20 40 60 80	20 40 60 80		
					20 40 60 80	20 40 60 80		
					20 40 60 80	20 40 60 80		
30								734.0
31								733.0
32			G15					732.0
33	CLAY (INFILL): silty, sandy, trace gravel, high plastic, dark grey			- Nbn - Vr < 30%, lenses < 2 mm thick - Vs < 10 mm thick				731.0
34			G16					730.0
35			G17					729.0
36	BEDROCK: poor quality, weathered, moderately friable orangy brown			- Nf - Vx < 2%				728.0
37								727.0
38								726.0
39			G18					725.0
40			G19					724.0
41				- Nf - Vx < 2%				723.0
42			G20					722.0
43								721.0
44	END OF BOREHOLE at 43.3 m - set HW casing 1.2 m below OG - installed inclinometer to 726.5 m - azimuth of A+ direction is 353°		G21					720.0
45								



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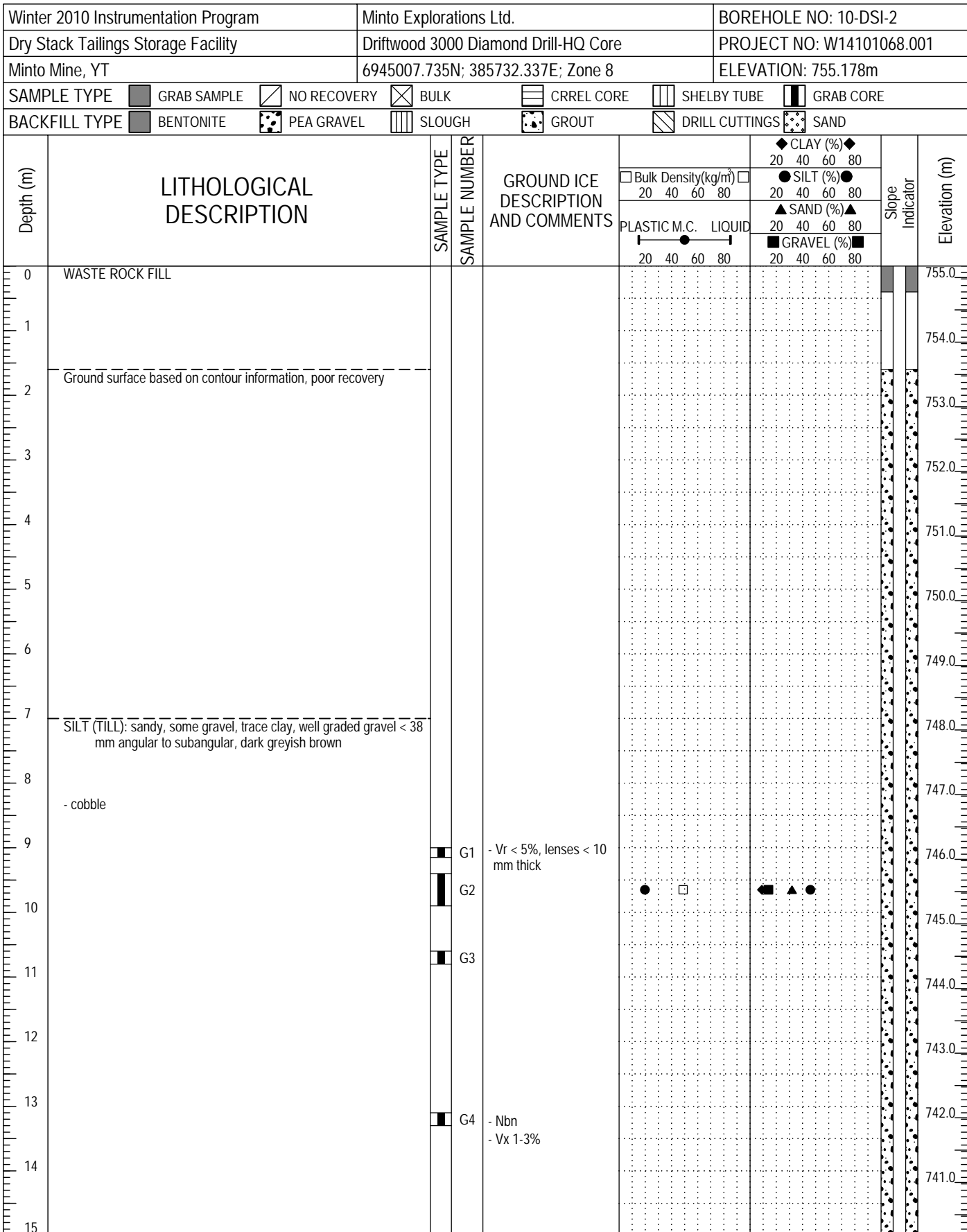
REVIEWED BY: JPB

DRAWING NO:

COMPLETION DEPTH: 43.3m

COMPLETE: 1/25/2010

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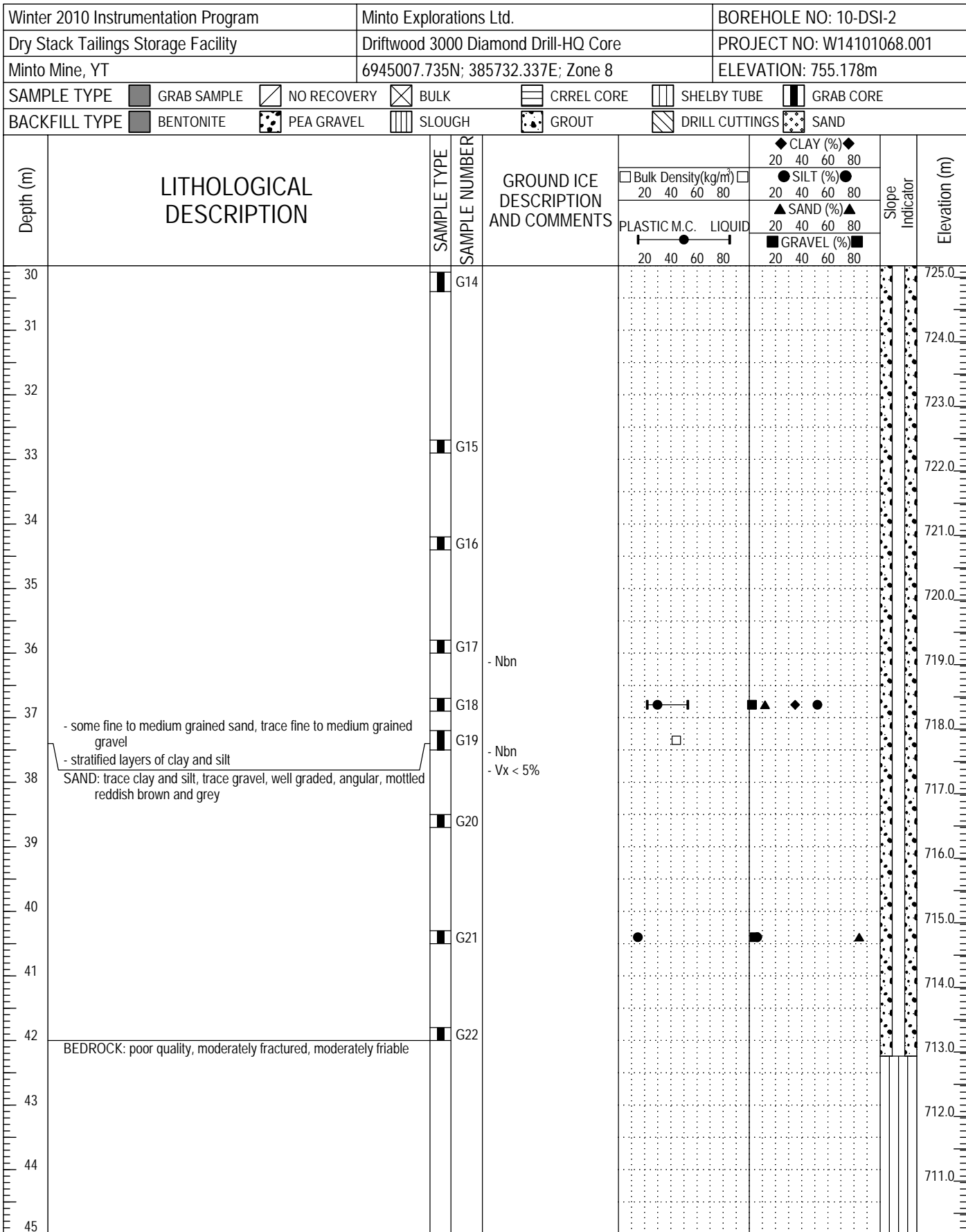
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REVIEWED BY: JPB	COMPLETE: 1/24/2010
DRAWING NO:	Page 1 of 4

Winter 2010 Instrumentation Program		Minto Explorations Ltd.		BOREHOLE NO: 10-DSI-2					
Dry Stack Tailings Storage Facility		Driftwood 3000 Diamond Drill-HQ Core		PROJECT NO: W14101068.001					
Minto Mine, YT		6945007.735N; 385732.337E; Zone 8		ELEVATION: 755.178m					
SAMPLE TYPE		GRAB SAMPLE	NO RECOVERY	BULK	CRREL CORE	SHELBY TUBE	GRAB CORE		
BACKFILL TYPE		BENTONITE	PEA GRAVEL	SLOUGH	GROUT	DRILL CUTTINGS	SAND		
Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density(kg/m <sup>3</sup> )		CLAY (%)	Slope Indicator	Elevation (m)
					20 40 60 80	20 40 60 80	20 40 60 80		
					PLASTIC M.C.	LIQUID	SILT (%)		
					20 40 60 80	20 40 60 80	20 40 60 80		
							SAND (%)		
							20 40 60 80		
							GRAVEL (%)		
							20 40 60 80		
15			G5						740.0
16									739.0
17	- some clay		G6	- Vr, lenses < 2 mm thick					738.0
18	- trace gravel, dark brown			- Nbn - Vx < 1-5% - trace Vc - trace Vr < 10 mm thick lens					737.0
19			G7						736.0
20									735.0
21			G8						734.0
22	- gravelly, < 40 mm, subrounded								733.0
23			G9						732.0
24	- no gravel, coarse grained sand		G10						731.0
25	CLAY: silty, some sand, trace gravel, slickensided, high plastic, dark grey			- Vs, 5-40 mm thick ice lenses irregularly spaced 400-500 mm - 30 mm thick ice lens					730.0
26			G11						729.0
27									728.0
28			G12						727.0
29			G13	- Nbn - Vx < 5% - Vs, 5-75 mm thick ice lenses irregularly spaced 100-350 mm					726.0
30									



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COMPLETION DEPTH: 50m

COMPLETE: 1/24/2010

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Winter 2010 Instrumentation Program		Minto Explorations Ltd.		BOREHOLE NO: 10-DSI-2				
Dry Stack Tailings Storage Facility		Driftwood 3000 Diamond Drill-HQ Core		PROJECT NO: W14101068.001				
Minto Mine, YT		6945007.735N; 385732.337E; Zone 8		ELEVATION: 755.178m				
SAMPLE TYPE		<input type="checkbox"/> GRAB SAMPLE	<input type="checkbox"/> NO RECOVERY	<input type="checkbox"/> BULK	<input type="checkbox"/> CRREL CORE	<input type="checkbox"/> SHELBY TUBE	<input type="checkbox"/> GRAB CORE	
BACKFILL TYPE		<input type="checkbox"/> BENTONITE	<input type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input type="checkbox"/> SAND	
Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density(kg/m <sup>3</sup> )		Slope Indicator	Elevation (m)
					20 40 60 80	20 40 60 80		
					PLASTIC M.C.	LIQUID		
					20 40 60 80	20 40 60 80		
							◆ CLAY (%) ◆	
							20 40 60 80	
							● SILT (%) ●	
							20 40 60 80	
							▲ SAND (%) ▲	
							20 40 60 80	
							■ GRAVEL (%) ■	
							20 40 60 80	
45								710.0
46								709.0
47								708.0
48								707.0
49								706.0
50								705.0
51	END OF BOREHOLE at 50 m - set HW casing 1.2 m below OG - installed inclinometer to 712.9 m - azimuth of A+ direction is 25°							704.0
52								703.0
53								702.0
54								701.0
55								700.0
56								699.0
57								698.0
58								697.0
59								696.0
60								

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REVIEWED BY: JPB	COMPLETE: 1/24/2010
DRAWING NO:	Page 4 of 4

Winter 2010 Instrumentation Program		Minto Explorations Ltd.		BOREHOLE NO: 10-DSI-3						
Dry Stack Tailings Storage Facility		Driftwood 3000 Diamond Drill-HQ Core		PROJECT NO: W14101068.001						
Minto Mine, YT		6944901.582N; 385505.363E; Zone 8		ELEVATION: 775.671m						
<b>SAMPLE TYPE</b> <input checked="" type="checkbox"/> GRAB SAMPLE <input type="checkbox"/> NO RECOVERY <input checked="" type="checkbox"/> BULK <input type="checkbox"/> CRREL CORE <input type="checkbox"/> SHELBY TUBE <input type="checkbox"/> GRAB CORE										
<b>BACKFILL TYPE</b> <input checked="" type="checkbox"/> BENTONITE <input type="checkbox"/> PEA GRAVEL <input type="checkbox"/> SLOUGH <input type="checkbox"/> GROUT <input type="checkbox"/> DRILL CUTTINGS <input type="checkbox"/> SAND										
Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density(kg/m <sup>3</sup> )		PLASTIC M.C. LIQUID		Slope Indicator	Elevation (m)
					20 40 60 80	20 40 60 80	20 40 60 80	20 40 60 80		
0	TAILINGS			- Nbn						775.0
1										774.0
2										773.0
3				- 40 mm thick ice lens, clear, white inclusions, tailings inclusions						772.0
4	- occasional cobbles and boulders									771.0
5										770.0
6										769.0
7										768.0
8										767.0
9										766.0
10	ORGANICS									765.0
11	SAND - gravelly, brown, occasional cobbles - silty, fine grained			- Nbe						764.0
12	CLAY (TILL) - some silt, trace gravel, high plastic - gravel < 50 mm		G1							763.0
13	- 100 mm cobbles - some gravel, gravel < 20 mm, subrounded to angular, medium plastic, brown									762.0
14	SAND (TILL) - some silt, trace gravel, fine to medium grained gravel, grey brown			- Nbe						761.0
15	CLAY (TILL) - sandy, some silt, some gravel, gravel < 20 mm, subrounded to angular, medium plastic, brown - poor recovery									760.0
16										759.0
17										



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DRAWING NO:

COMPLETION DEPTH: 63.4m

COMPLETE: 4/5/2010

Page 1 of 4

Winter 2010 Instrumentation Program		Minto Explorations Ltd.		BOREHOLE NO: 10-DSI-3						
Dry Stack Tailings Storage Facility		Driftwood 3000 Diamond Drill-HQ Core		PROJECT NO: W14101068.001						
Minto Mine, YT		6944901.582N; 385505.363E; Zone 8		ELEVATION: 775.671m						
SAMPLE TYPE		<input checked="" type="checkbox"/> GRAB SAMPLE	<input type="checkbox"/> NO RECOVERY	<input checked="" type="checkbox"/> BULK	<input type="checkbox"/> CRREL CORE	<input type="checkbox"/> SHELBY TUBE	<input checked="" type="checkbox"/> GRAB CORE			
BACKFILL TYPE		<input checked="" type="checkbox"/> BENTONITE	<input type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input type="checkbox"/> SAND			
Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density(kg/m <sup>3</sup> )		PLASTIC M.C. LIQUID		Slope Indicator	Elevation (m)
					20	40	60	80		
17										758.0
18	SILT (TILL) - some sand, some gravel, gravel < 10 mm, low plastic	<input checked="" type="checkbox"/>	G2	- Vx/Vr < 10%						757.0
19	- trace fine grained gravel, trace cobbles									756.0
20										755.0
21	CLAY (TILL) - gravelly, some cobbles, some silt, trace sand, subrounded gravel, medium plastic, grey									754.0
22	- poor recovery from 20.7 m - 22.2 m									753.0
23	- some sand, some gravel, some silt, high plastic			- Vx/Vr/Vc < 30%						752.0
24	- poor recovery from 23.7 m - 25.3 m, recovered subrounded to subangular gravels < 50 mm									751.0
25		<input checked="" type="checkbox"/>	G3							750.0
26	- some silt, trace sand, trace gravel, high plastic			- Vr/Vx < 40%						749.0
27		<input checked="" type="checkbox"/>	G4							748.0
28	SILT (TILL) - some sand, trace clay, trace gravel, low to non-plastic, brown	<input checked="" type="checkbox"/>	G6	- Vr/Vx < 20%						747.0
29	- some gravel, trace cobbles	<input checked="" type="checkbox"/>	G7	- Vx < 10%						746.0
30				- Vs < 1%, lenses < 3 mm thick						745.0
31	CLAY (TILL) - some silt, some gravel, medium to coarse grained gravel, high plastic			- Vx < 20%						744.0
32	SILT (TILL) - clayey, some sand, trace gravel, trace cobbles, fine grained sand	<input checked="" type="checkbox"/>	G8	- Vr < 10%						743.0
33	CLAY - silty, trace sand, trace gravel, medium plastic, grey			- Vx/Vr < 10%						742.0
34		<input checked="" type="checkbox"/>	G9							
	- trace to some gravel, medium plastic			- Nbn						
	- 300 mm thick sand layer	<input checked="" type="checkbox"/>	G10							



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REVIEWED BY: JPB	COMPLETE: 4/5/2010
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Winter 2010 Instrumentation Program		Minto Explorations Ltd.		BOREHOLE NO: 10-DSI-3				
Dry Stack Tailings Storage Facility		Driftwood 3000 Diamond Drill-HQ Core		PROJECT NO: W14101068.001				
Minto Mine, YT		6944901.582N; 385505.363E; Zone 8		ELEVATION: 775.671m				
SAMPLE TYPE		<input checked="" type="checkbox"/> GRAB SAMPLE	<input type="checkbox"/> NO RECOVERY	<input checked="" type="checkbox"/> BULK	<input type="checkbox"/> CRREL CORE	<input type="checkbox"/> SHELBY TUBE	<input checked="" type="checkbox"/> GRAB CORE	
BACKFILL TYPE		<input checked="" type="checkbox"/> BENTONITE	<input type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input type="checkbox"/> SAND	
Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density(kg/m <sup>3</sup> )		Slope Indicator	Elevation (m)
					PLASTIC M.C.	LIQUID		
					20 40 60 80	20 40 60 80		
					20 40 60 80	20 40 60 80		
					20 40 60 80	20 40 60 80		
					20 40 60 80	20 40 60 80		
51	- gravel < 20 mm, angular to subangular, silt layers < 30 mm thick	<input checked="" type="checkbox"/>	G21	10 mm				724.0
52		<input checked="" type="checkbox"/>	G22	- Nbn - Vs < 2%, lenses < 3 mm thick				723.0
53								722.0
54		<input checked="" type="checkbox"/>	G23					721.0
55								720.0
56	SAND (RESIDUUM)- some gravel, well graded sand, gravel < 10 mm angular, brown	<input checked="" type="checkbox"/>	G24	- Nbn				719.0
57		<input checked="" type="checkbox"/>	G25					718.0
58	BEDROCK - highly weathered oxidized joints							717.0
59								716.0
60	- rock becomes more competent with depth							715.0
61								714.0
62								713.0
63								712.0
64	END OF BOREHOLE 63.4 m - set HW casing 1.2 m below OG - installed inclinometer to 713.5 m - azimuth of A+ direction is 42°							711.0
65								710.0
66								709.0
67								708.0
68								



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LOGGED BY: JGD & MD


REVIEWED BY: JPB

DRAWING NO:

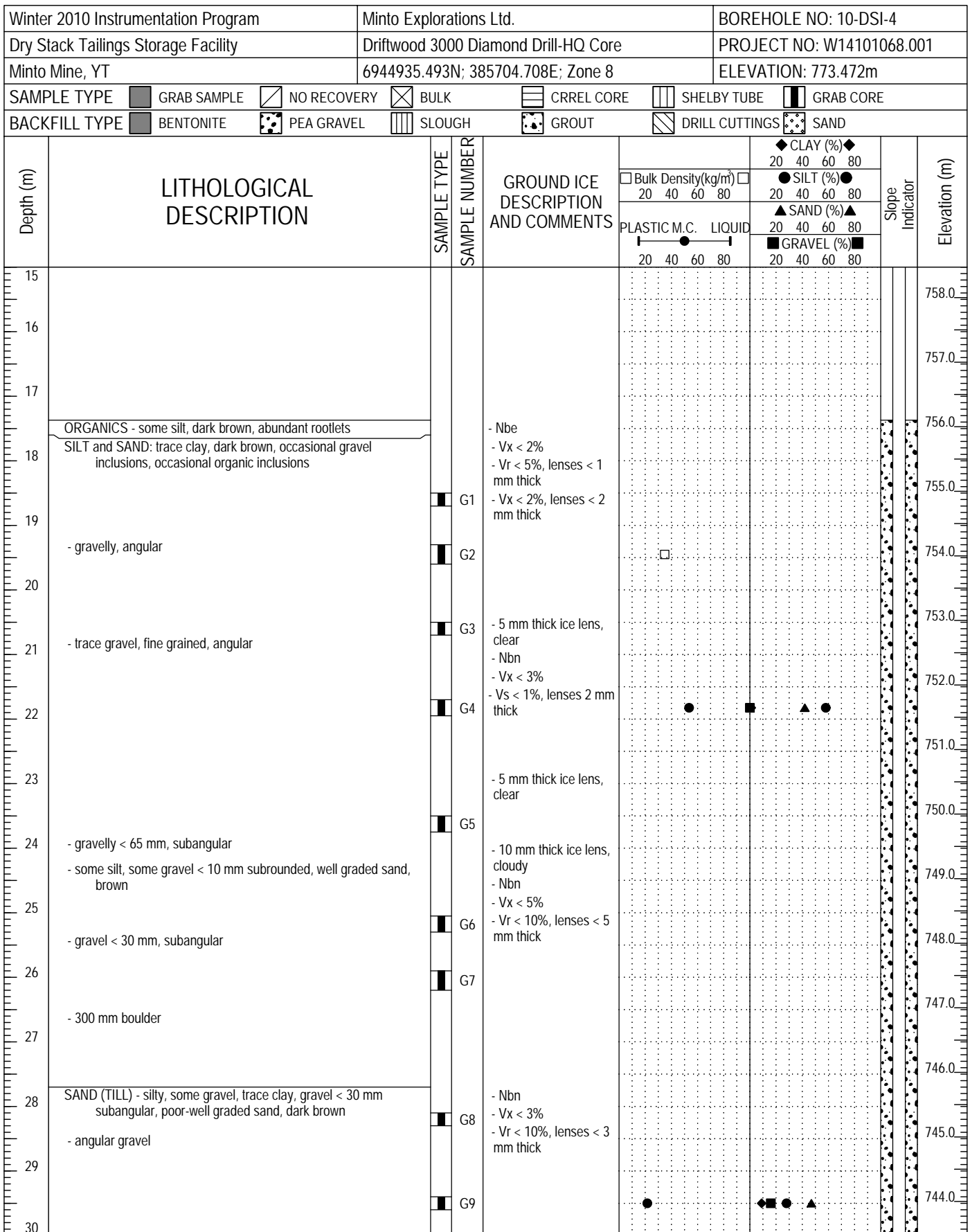
COMPLETION DEPTH: 63.4m

COMPLETE: 4/5/2010

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Winter 2010 Instrumentation Program		Minto Explorations Ltd.		BOREHOLE NO: 10-DSI-4						
Dry Stack Tailings Storage Facility		Driftwood 3000 Diamond Drill-HQ Core		PROJECT NO: W14101068.001						
Minto Mine, YT		6944935.493N; 385704.708E; Zone 8		ELEVATION: 773.472m						
SAMPLE TYPE		<input type="checkbox"/> GRAB SAMPLE	<input type="checkbox"/> NO RECOVERY	<input type="checkbox"/> BULK	<input type="checkbox"/> CRREL CORE	<input type="checkbox"/> SHELBY TUBE	<input type="checkbox"/> GRAB CORE			
BACKFILL TYPE		<input type="checkbox"/> BENTONITE	<input type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input type="checkbox"/> SAND			
Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density(kg/m <sup>3</sup> )		PLASTIC M.C. LIQUID		Slope Indicator	Elevation (m)
					20 40 60 80	20 40 60 80	20 40 60 80	20 40 60 80		
0	WASTE ROCK FILL									773.0
1										772.0
2										771.0
3										770.0
4										769.0
5										768.0
6										767.0
7										766.0
8										765.0
9	TAILINGS									764.0
10										763.0
11										762.0
12										761.0
13	WASTE ROCK FILL									760.0
14										759.0
15										
 <b>EBA Engineering Consultants Ltd.</b>				LOGGED BY: JGD & MD		COMPLETION DEPTH: 85.6m				
				REVIEWED BY: JPB		COMPLETE: 4/4/2010				
				DRAWING NO:		Page 1 of 6				





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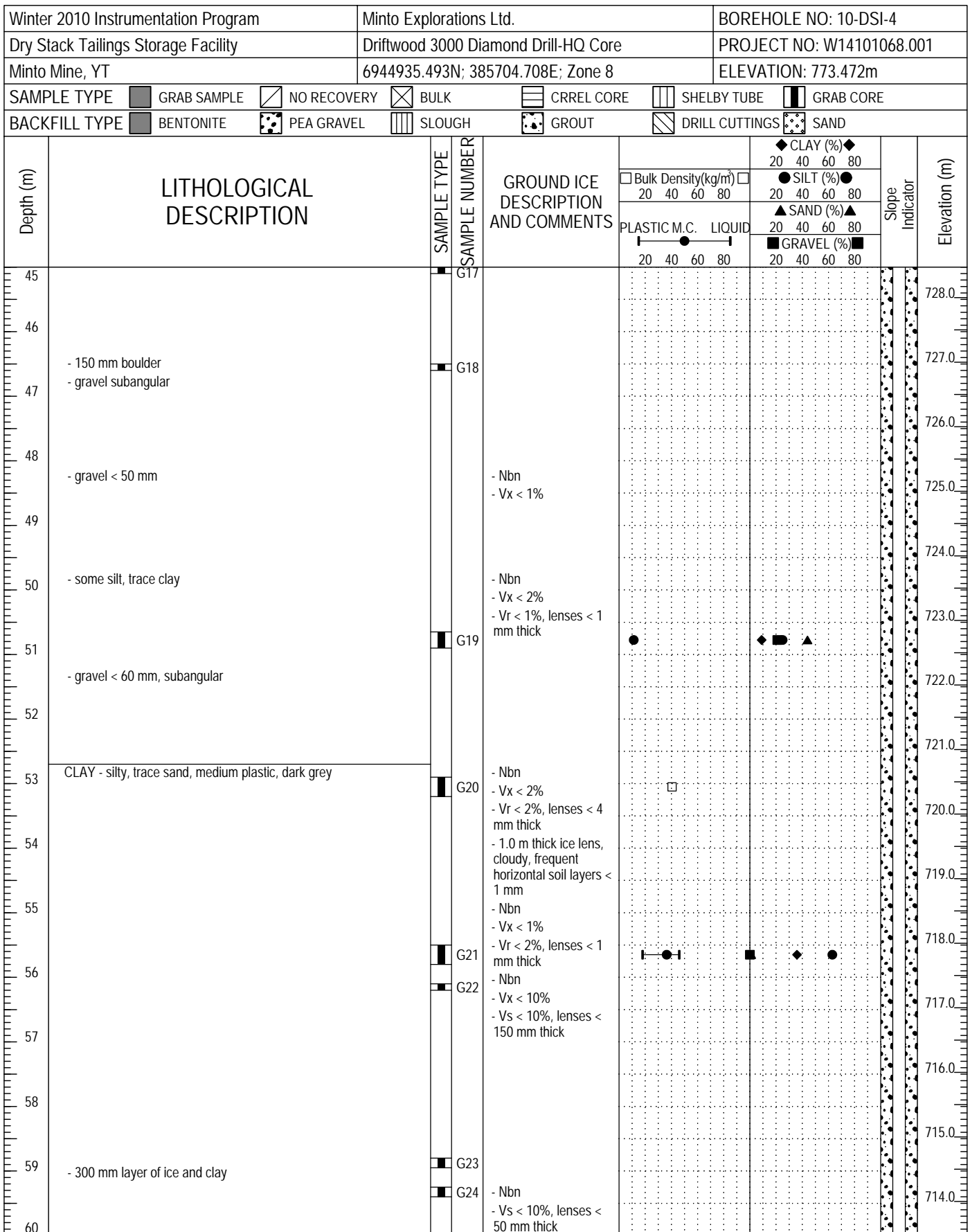
LOGGED BY: JGD & MD	COMPLETION DEPTH: 85.6m
REVIEWED BY: JPB	COMPLETE: 4/4/2010
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Winter 2010 Instrumentation Program		Minto Explorations Ltd.		BOREHOLE NO: 10-DSI-4								
Dry Stack Tailings Storage Facility		Driftwood 3000 Diamond Drill-HQ Core		PROJECT NO: W14101068.001								
Minto Mine, YT		6944935.493N; 385704.708E; Zone 8		ELEVATION: 773.472m								
SAMPLE TYPE		<input checked="" type="checkbox"/> GRAB SAMPLE	<input type="checkbox"/> NO RECOVERY	<input checked="" type="checkbox"/> BULK	<input type="checkbox"/> CRREL CORE	<input type="checkbox"/> SHELBY TUBE	<input checked="" type="checkbox"/> GRAB CORE					
BACKFILL TYPE		<input checked="" type="checkbox"/> BENTONITE	<input checked="" type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input checked="" type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input checked="" type="checkbox"/> SAND					
Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density(kg/m <sup>3</sup> )		PLASTIC M.C.		LIQUID		Slope Indicator	Elevation (m)
					20	40	60	80	20	40		
30	- subangular to subrounded gravel			- Vr < 1%, lenses < 2mm thick								743.0
31		<input checked="" type="checkbox"/>	G10	- Vr < 3%, lenses < 5mm thick								742.0
32	- some gravel < 30 mm, subangular											741.0
33	- silt lenses < 5 mm thick, low to non plastic											740.0
34	- 100 mm sand pocket, poorly graded, fine grained, brown			- Nbn								739.0
35	- trace to some silt, gravel < 15 mm, subangular, brown			- Vr < 3%, lenses < 2 mm thick								738.0
36	- 400 mm silt till layer, sandy, some gravel, gravel < 10 mm, non plastic	<input checked="" type="checkbox"/>	G11	- Vr = 15 mm thick, clear								737.0
37	- gravel < 60 mm	<input checked="" type="checkbox"/>	G12	- Vr = 10 mm thick, vertical, cloudy								736.0
38	CLAY - silty, trace sand, medium plastic, dark grey			- Nbe								735.0
39	- 1.1 m of clay intermixed with ice	<input checked="" type="checkbox"/>	G13	- Vr < 40%, crystals < 2 mm, cubical								734.0
40	- occasional slickensides, blocky			- Nbn								733.0
41		<input checked="" type="checkbox"/>	G14	- Vr < 2%, lenses < 1 mm thick								732.0
42	- sandy, some gravel, gravel < 15 mm, occasional silt lenses < 15 mm thick											731.0
43	SAND AND GRAVEL - well graded sand, gravel < 75 mm subrounded to angular, dark brown, occasional cobbles < 170 mm											730.0
44				- Nbn								729.0
45	- silty, poorly graded sand, no cobbles present			- Vr < 1%								



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**EBA Engineering Consultants Ltd.**

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REVIEWED BY: JPB	COMPLETE: 4/4/2010
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Winter 2010 Instrumentation Program		Minto Explorations Ltd.		BOREHOLE NO: 10-DSI-4								
Dry Stack Tailings Storage Facility		Driftwood 3000 Diamond Drill-HQ Core		PROJECT NO: W14101068.001								
Minto Mine, YT		6944935.493N; 385704.708E; Zone 8		ELEVATION: 773.472m								
SAMPLE TYPE		<input checked="" type="checkbox"/> GRAB SAMPLE	<input type="checkbox"/> NO RECOVERY	<input checked="" type="checkbox"/> BULK	<input type="checkbox"/> CRREL CORE	<input type="checkbox"/> SHELBY TUBE	<input checked="" type="checkbox"/> GRAB CORE					
BACKFILL TYPE		<input checked="" type="checkbox"/> BENTONITE	<input type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input type="checkbox"/> SAND					
Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density(kg/m <sup>3</sup> )		PLASTIC M.C.		LIQUID		Slope Indicator	Elevation (m)
					20	40	60	80	20	40		
60		<input checked="" type="checkbox"/>	G25									713.0
61												712.0
62												711.0
63		<input checked="" type="checkbox"/>	G26	- Vs < 5%, lenses < 20 mm thick								710.0
64												709.0
65		<input checked="" type="checkbox"/>	G27	- Vs < 20%, lenses < 80 mm thick								708.0
66												707.0
67												706.0
68		<input checked="" type="checkbox"/>	G28	- Nbn								705.0
69	- frequent sand seams, fine grained, < 3 mm											704.0
70												703.0
71												702.0
72	- some sand, grey											701.0
73	- occasional gravel, coarse grained											700.0
74	- brownie grey											699.0
75												



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LOGGED BY: JGD & MD	COMPLETION DEPTH: 85.6m
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Winter 2010 Instrumentation Program		Minto Explorations Ltd.		BOREHOLE NO: 10-DSI-4				
Dry Stack Tailings Storage Facility		Driftwood 3000 Diamond Drill-HQ Core		PROJECT NO: W14101068.001				
Minto Mine, YT		6944935.493N; 385704.708E; Zone 8		ELEVATION: 773.472m				
SAMPLE TYPE		<input type="checkbox"/> GRAB SAMPLE	<input type="checkbox"/> NO RECOVERY	<input type="checkbox"/> BULK	<input type="checkbox"/> CRREL CORE	<input type="checkbox"/> SHELBY TUBE	<input type="checkbox"/> GRAB CORE	
BACKFILL TYPE		<input type="checkbox"/> BENTONITE	<input type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input type="checkbox"/> SAND	
Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density(kg/m <sup>3</sup> )		Slope Indicator	Elevation (m)
					20 40 60 80	20 40 60 80		
					PLASTIC M.C.	LIQUID		
					20 40 60 80	20 40 60 80		
75								698.0
76								697.0
77								696.0
78								695.0
79	BEDROCK - highly weathered fractures spaced 30-50 mm apart							694.0
80	- oxide staining							693.0
81								692.0
82								691.0
83	- moderately to closely spaced joints, sand infilled joints							690.0
84								689.0
85								688.0
86	END OF BOREHOLE 85.6 m - set HW casing 1.5 m below OG - installed inclinometer to 687.9 m - azimuth of A+ direction is 10°							687.0
87								686.0
88								685.0
89								684.0
90								



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LOGGED BY: JGD & MD	COMPLETION DEPTH: 85.6m
REVIEWED BY: JPB	COMPLETE: 4/4/2010
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Winter 2010 Instrumentation Program		Minto Explorations Ltd.		BOREHOLE NO: 10-DSI-5								
Dry Stack Tailings Storage Facility		Driftwood 3000 Diamond Drill-HQ Core		PROJECT NO: W14101068.001								
Minto Mine, YT		6944583.35N; 385509.075E; Zone 8		ELEVATION: 790.66m								
SAMPLE TYPE		GRAB SAMPLE	NO RECOVERY	BULK	CRREL CORE	SHELBY TUBE	GRAB CORE					
BACKFILL TYPE		BENTONITE	PEA GRAVEL	SLOUGH	GROUT	DRILL CUTTINGS	SAND					
Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density(kg/m <sup>3</sup> )		PLASTIC M.C.		LIQUID		Slope Indicator	Elevation (m)
					20	40	60	80	20	40		
0	TAILINGS											790.0
1												789.0
2												788.0
3												787.0
4	ORGANICS SAND - gravelly, coarse grained sand, occasional cobbles - poor recovery from 3.6 to 10.1 m											786.0
5												785.0
6												784.0
7												783.0
8												782.0
9												781.0
10												780.0
11	CLAY - silty, trace sand, medium plastic, dark grey, silt pockets			- Nbn - Vx/Vs < 10%								779.0
12		G1										778.0
13	SAND - clayey, trace silt, medium grained, greyish brown	G2		- Nbn								777.0
14	SILT - some clay, low plastic, brown	G3		- Nbn								776.0
15	SAND - trace silt, trace gravel, medium to coarse grained sand, poorly graded											776.0
												776.0



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REVIEWED BY: JPB	COMPLETE: 4/5/2010
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Winter 2010 Instrumentation Program		Minto Explorations Ltd.		BOREHOLE NO: 10-DSI-5								
Dry Stack Tailings Storage Facility		Driftwood 3000 Diamond Drill-HQ Core		PROJECT NO: W14101068.001								
Minto Mine, YT		6944583.35N; 385509.075E; Zone 8		ELEVATION: 790.66m								
SAMPLE TYPE		GRAB SAMPLE	NO RECOVERY	BULK	CRREL CORE	SHELBY TUBE	GRAB CORE					
BACKFILL TYPE		BENTONITE	PEA GRAVEL	SLOUGH	GROUT	DRILL CUTTINGS	SAND					
Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density(kg/m <sup>3</sup> )		PLASTIC M.C.		LIQUID		Slope Indicator	Elevation (m)
					20	40	60	80	20	40		
15												775.0
16	SAND AND GRAVEL - trace silt, well graded, brown	█	G4	- Nbn - Vx < 5%, occasional cubes < 1 mm								774.0
17	SILT and SAND - trace clay, trace gravel, low plastic, brown	█	G5	- Nbe - Vr < 15% - frequent 10 mm thick ice lenses								773.0
18												772.0
19	- gravelly, grey	█	G6	- Nbn - Vx/Vr < 10% - Vs < 5%, lenses < 80 mm thick, clear								771.0
20	- 200 mm thick ice and clay layer	█	G7									770.0
21												769.0
22		█	G8	- Vx < 20% - Vs, lenses < 150 mm thick, clear								768.0
23	- frequent sand layers < 250 mm thick			- Vx < 40%								767.0
24	CLAY (TILL) - some sand, some silt, medium plastic, grey			- Nbe								766.0
25	- gravelly	█	G9	- Vx < 30% - 150 mm thick ice lens, clear, trace soil inclusions								765.0
26	- sandy, trace silt, trace gravel, high plastic			- Nbn								764.0
27	SAND (TILL) - some clay, trace gravel, well graded, greyish brown	█	G10									763.0
28	CLAY (TILL) - some sand, trace gravel SILT (TILL) - sandy, trace gravel, brown			- Nbn - Vs < 10% - Vx < 5%								762.0
29	CLAY (TILL) - silty, trace sand, high plastic, grey			- Vx < 30% - Nbn								761.0
30	- brown	█	G11	- Vx < 30% - Vs, lenses < 150 mm thick								761.0



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Winter 2010 Instrumentation Program		Minto Explorations Ltd.		BOREHOLE NO: 10-DSI-5								
Dry Stack Tailings Storage Facility		Driftwood 3000 Diamond Drill-HQ Core		PROJECT NO: W14101068.001								
Minto Mine, YT		6944583.35N; 385509.075E; Zone 8		ELEVATION: 790.66m								
SAMPLE TYPE		GRAB SAMPLE	NO RECOVERY	BULK	CRREL CORE	SHELBY TUBE	GRAB CORE					
BACKFILL TYPE		BENTONITE	PEA GRAVEL	SLOUGH	GROUT	DRILL CUTTINGS	SAND					
Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density (kg/m <sup>3</sup> )		PLASTIC M.C.		LIQUID		Slope Indicator	Elevation (m)
					20	40	60	80	20	40		
30	- grey		G12	- Vx < 40%								760.0
31			G13									759.0
32	- 300 mm ice and clay layer (~60% ice) - bedding planes 5 mm thick			- Vx < 15%								758.0
33												757.0
34	- 500 mm ice and clay layer (~50% ice)		G14	- Vs, lenses < 200 mm thick								756.0
35			G15	- Vx < 20%								755.0
36												754.0
37			G16	- Vs, lenses < 100 mm thick - Vx/Vr < 40%								753.0
38	- dark grey, occasional dark greyish brown silt lenses < 1 m thick		G17	- Nbn - Vx < 2% - Vr < 3% - Vr < 3%, lenses < 2 mm thick - Vs < 5%, lenses < 40 mm								752.0
39												751.0
40			G18	- Nbe								750.0
41	- occasional greyish brown silt pockets, occasional gravel < 20 mm		G19	- Nbn								749.0
42												748.0
43	- trace to some gravel < 40 mm, subrounded											747.0
44	SAND - gravelly, trace silt, well graded sand, gravel < 10 mm, angular, orangey brown, occasional cobbles < 120 mm		G20	- Nbn								746.0
45			G21									



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Winter 2010 Instrumentation Program		Minto Explorations Ltd.		BOREHOLE NO: 10-DSI-5				
Dry Stack Tailings Storage Facility		Driftwood 3000 Diamond Drill-HQ Core		PROJECT NO: W14101068.001				
Minto Mine, YT		6944583.35N; 385509.075E; Zone 8		ELEVATION: 790.66m				
SAMPLE TYPE		<input type="checkbox"/> GRAB SAMPLE	<input type="checkbox"/> NO RECOVERY	<input type="checkbox"/> BULK	<input type="checkbox"/> CRREL CORE	<input type="checkbox"/> SHELBY TUBE	<input type="checkbox"/> GRAB CORE	
BACKFILL TYPE		<input type="checkbox"/> BENTONITE	<input type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input type="checkbox"/> SAND	
Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density(kg/m <sup>3</sup> )		Slope Indicator	Elevation (m)
					20 40 60 80	20 40 60 80		
					PLASTIC M.C.	LIQUID		
					20 40 60 80	20 40 60 80		
45								745.0
46								744.0
47								743.0
48	BEDROCK - highly weathered, friable oxidized joints, joints infilled with sand and gravel pieces, brown							742.0
49	- competent							741.0
50								740.0
51								739.0
52	- joints spaced 200-600 mm							738.0
53								737.0
54								736.0
55								735.0
56	END OF BOREHOLE 55.8 m							734.0
57	- installed inclinometer to 737.1 m							733.0
58	- azimuth of A+ direction is 16°							732.0
59								731.0
60								



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REVIEWED BY: JPB	COMPLETE: 4/5/2010
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Fall 2010 Instrumentation Program		Minto Explorations Ltd.		BOREHOLE NO: 10-DSI-6								
Dry Stack Tailings Storage Facility		Driftwood 3000 Diamond Drill-HQ Core		PROJECT NO: W14101068.001								
Minto Mine, YT		6944972N; 385653.5E; Zone 8		ELEVATION: 766.496m								
SAMPLE TYPE		<input checked="" type="checkbox"/> GRAB SAMPLE	<input type="checkbox"/> NO RECOVERY	<input checked="" type="checkbox"/> BULK	<input type="checkbox"/> CRREL CORE	<input type="checkbox"/> SHELBY TUBE	<input checked="" type="checkbox"/> GRAB CORE					
BACKFILL TYPE		<input checked="" type="checkbox"/> BENTONITE	<input checked="" type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input checked="" type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input checked="" type="checkbox"/> SAND					
Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density (kg/m <sup>3</sup> )		PLASTIC M.C.		LIQUID		Slope Indicator	Elevation (m)
					20	40	60	80	20	40		
0	ROCK FILL											766.0
1												765.0
2												764.0
3												763.0
4												762.0
5												761.0
6												760.0
7												759.0
8												758.0
9	MUSKEG - organics		G1									757.0
10												756.0
11												755.0
12	SAND - trace silt, poorly graded, fine grained, brown			- Nbe								754.0
13			G2									753.0
14												752.0
15												751.0
16												750.0
17	SAND (TILL) - some silt, trace clay, trace gravel, well graded, medium-coarse grained, subgranular, brown		G3									749.0
18			G4									748.0
19	- poorly graded, fine grained, dark grey, peat bog odour, abundant organic lenses < 20 mm (thick brown fibrous)		G5									747.0
20			G6									746.0
21	- trace gravel, well graded, medium-coarse grained, subgranular, brown		G7									745.0
22												744.0
23	- poorly graded, fine grained, dark grey, odor rotten clams, abundant organic lenses < 20 mm thick, brown roots		G8		- Nbe, occasional ice lenses < 30 mm, clear							743.0
24												742.0
25	- round, brown		G9		- 70 mm ice lense, clear							742.0



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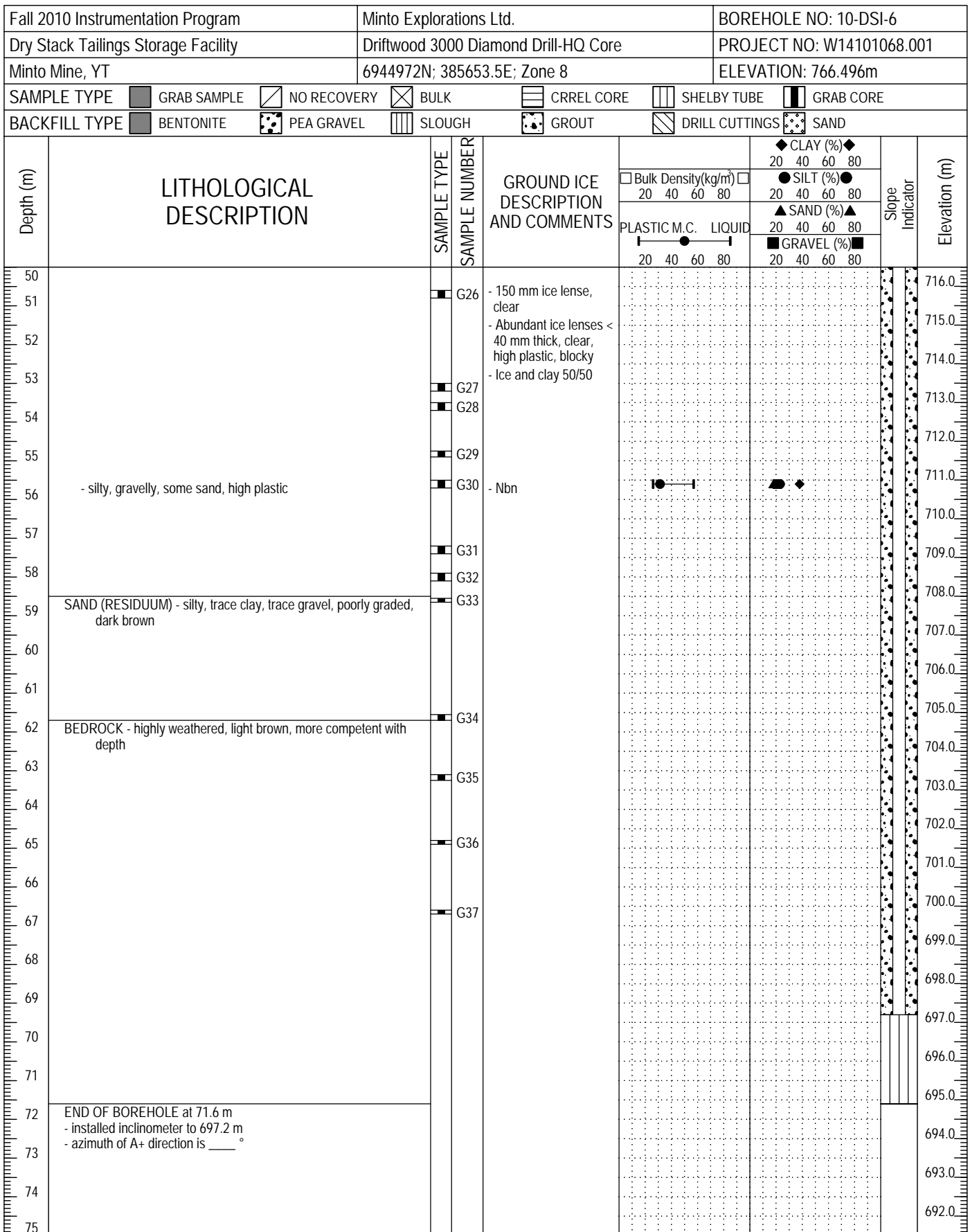
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REVIEWED BY: BC & JGD	COMPLETE: 11/9/2010
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Fall 2010 Instrumentation Program		Minto Explorations Ltd.		BOREHOLE NO: 10-DSI-6								
Dry Stack Tailings Storage Facility		Driftwood 3000 Diamond Drill-HQ Core		PROJECT NO: W14101068.001								
Minto Mine, YT		6944972N; 385653.5E; Zone 8		ELEVATION: 766.496m								
SAMPLE TYPE		GRAB SAMPLE	NO RECOVERY	BULK	CRREL CORE	SHELBY TUBE	GRAB CORE					
BACKFILL TYPE		BENTONITE	PEA GRAVEL	SLOUGH	GROUT	DRILL CUTTINGS	SAND					
Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density(kg/m <sup>3</sup> )		CLAY (%)	SILT (%)	SAND (%)	GRAVEL (%)	Slope Indicator	Elevation (m)
					PLASTIC M.C.	LIQUID						
25			G10									741.0
26												740.0
27				- Nbn, Vr < 2%								739.0
28			G11									738.0
29			G12									737.0
30	SILT - some sand, trace gravel, low-medium plastic, brown		G13	- 30 mm ice lense, clear - Ice and soil, abundant ice lenses < 50 mm thick, clear								736.0
31	- gravelly, silty, some clay, low-non plastic, greyish brown, occasional cobble		G14	- Abundant ice lenses < 150 mm thick, clear, some cloudy								735.0
32			G15	- Abundant ice lenses < 100 mm thick								734.0
33												733.0
34			G16									732.0
35	CLAY - silty, trace sand, slickensided, high plastic, dark grey		G17									731.0
36			G18	- Clay and ice 50/50								730.0
37												729.0
38			G19	- 100 mm ice lense, clear - 80 mm ice lense, half clear, half cloudy								728.0
39			G20	- Nbn, frequent ice lenses < 120 mm thick								727.0
40												726.0
41			G21	- 50 mm ice lense, clear - Ice lense, clear								725.0
42												724.0
43			G22	- Vr < 2%, < 2 mm thick, Nbn								723.0
44												722.0
45			G23	- Abundant ice lenses < 70 mm thick, clear, Vr < 1%, < 2 mm thick								721.0
46												720.0
47			G24	- Nbn, Vr < 2%, < 2 mm thick								719.0
48												718.0
49			G25	- Vertical ice lense ~5 mm thick - Ice and clay 50/50								717.0
50												



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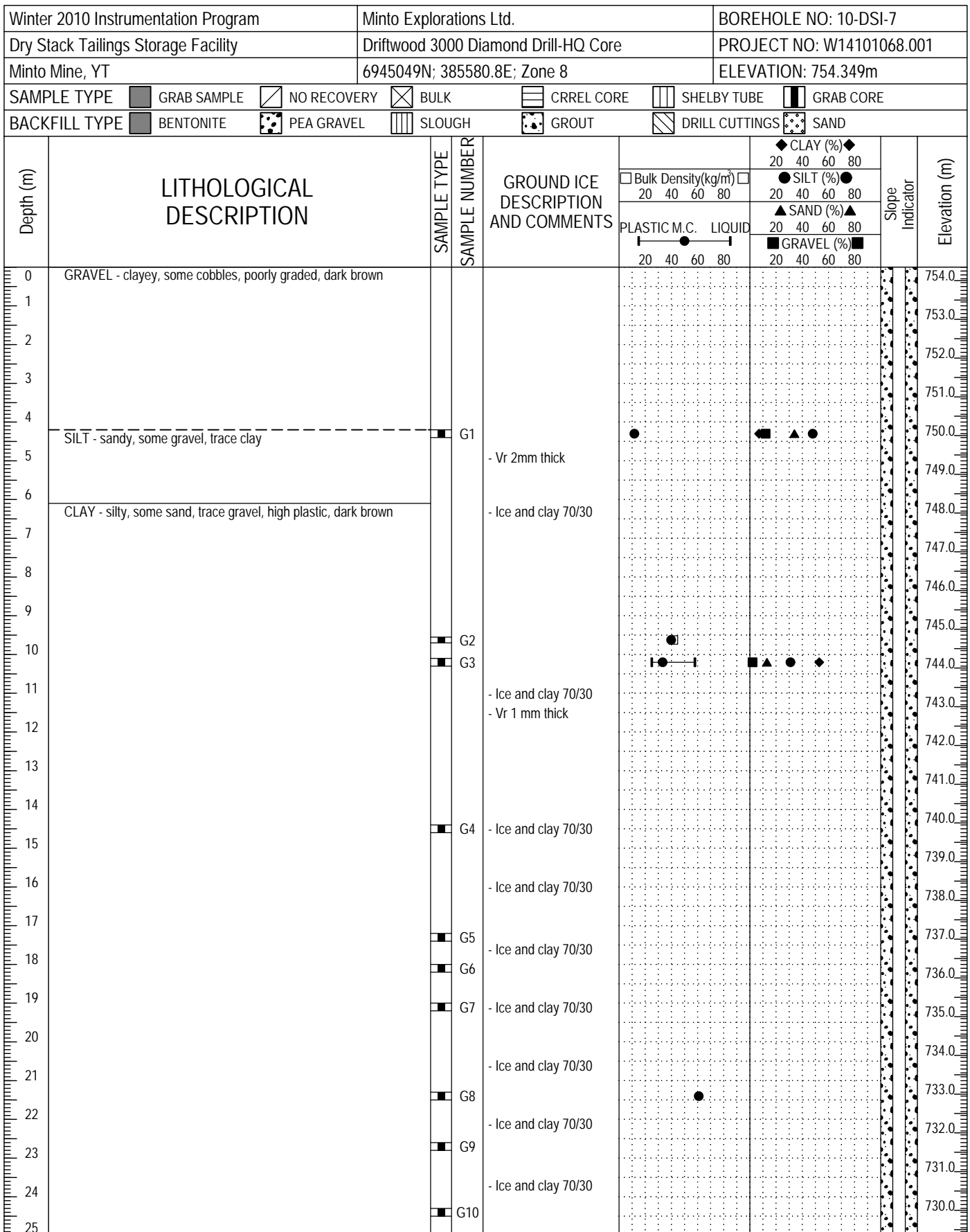
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REVIEWED BY: BC & JGD	COMPLETE: 11/9/2010
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**EBA Engineering Consultants Ltd.**

LOGGED BY: MD & KDJ	COMPLETION DEPTH: 71.6m
REVIEWED BY: BC & JGD	COMPLETE: 11/9/2010
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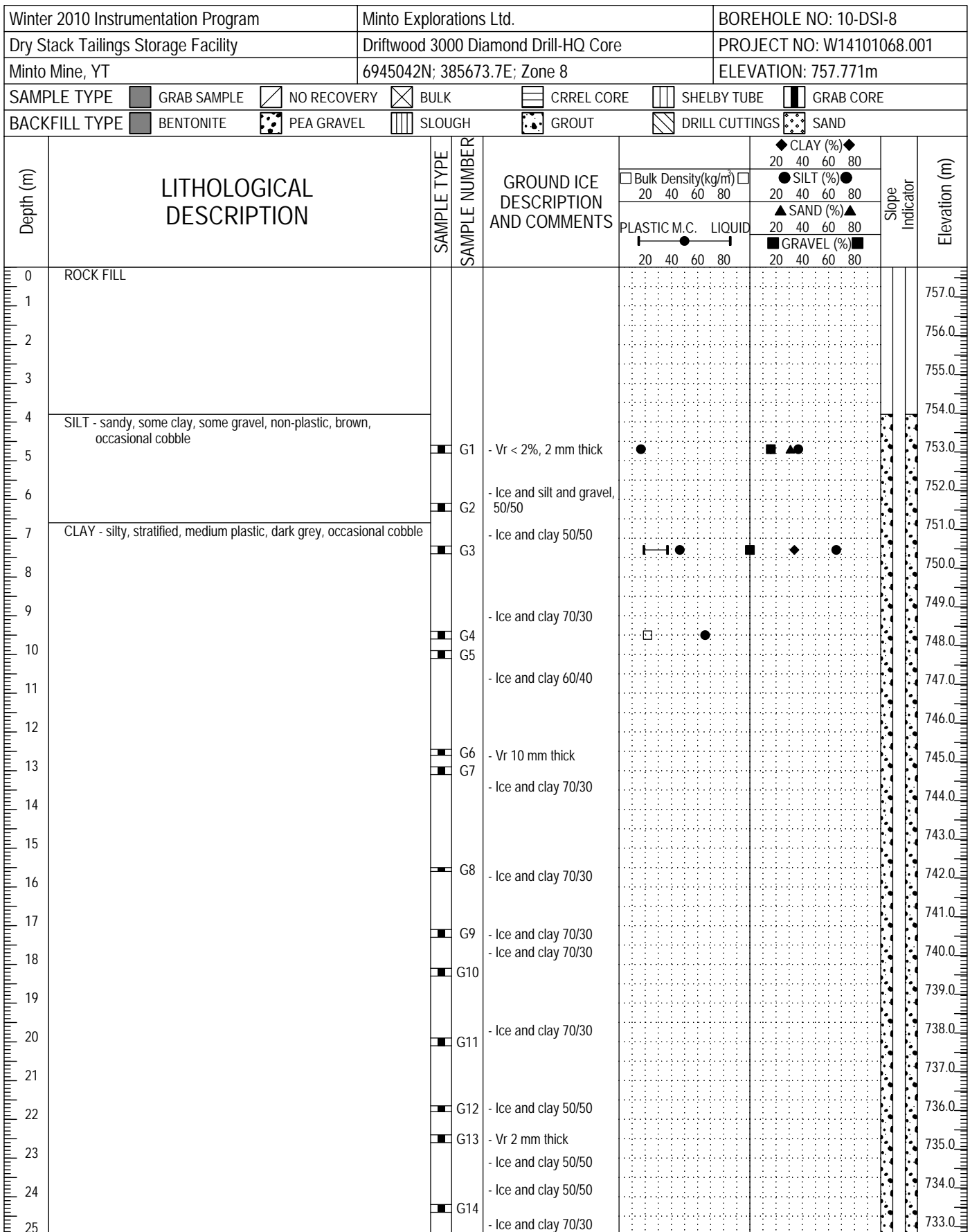
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REVIEWED BY: BC & JGD	COMPLETE: 11/10/2010
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Winter 2010 Instrumentation Program		Minto Explorations Ltd.		BOREHOLE NO: 10-DSI-7								
Dry Stack Tailings Storage Facility		Driftwood 3000 Diamond Drill-HQ Core		PROJECT NO: W14101068.001								
Minto Mine, YT		6945049N; 385580.8E; Zone 8		ELEVATION: 754.349m								
SAMPLE TYPE		GRAB SAMPLE	NO RECOVERY	BULK	CRREL CORE	SHELBY TUBE	GRAB CORE					
BACKFILL TYPE		BENTONITE	PEA GRAVEL	SLOUGH	GROUT	DRILL CUTTINGS	SAND					
Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density(kg/m <sup>3</sup> )		CLAY (%)	SILT (%)	SAND (%)	GRAVEL (%)	Slope Indicator	Elevation (m)
					PLASTIC M.C.	LIQUID						
25				- Ice and clay 70/30								729.0
26			G11									728.0
27			G12									727.0
28	SAND - silty, trace clay, trace gravel, poorly graded, coarse sand, fine gravel, reddish brown		G13									726.0
29			G14									725.0
30			G15									724.0
31												723.0
32												722.0
33				- Vr 3 mm thick								721.0
34	BEDROCK - brown		G16									720.0
35			G17									719.0
36			G18									718.0
37												717.0
38			G19									716.0
39			G20									715.0
40												714.0
41			G21									713.0
42			G22									712.0
43												711.0
44	END OF BOREHOLE at 43.3 m - installed inclinometer to 711.0 m - azimuth of A+ direction is ____°											710.0
45												709.0
46												708.0
47												707.0
48												706.0
49												705.0
50												704.0



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LOGGED BY: KDJ	COMPLETION DEPTH: 43.3m
REVIEWED BY: BC & JGD	COMPLETE: 11/10/2010
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LOGGED BY: MD & KDJ	COMPLETION DEPTH: 43.2m
REVIEWED BY: BC & JGD	COMPLETE: 11/10/2010
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Winter 2010 Instrumentation Program		Minto Explorations Ltd.		BOREHOLE NO: 10-DSI-8								
Dry Stack Tailings Storage Facility		Driftwood 3000 Diamond Drill-HQ Core		PROJECT NO: W14101068.001								
Minto Mine, YT		6945042N; 385673.7E; Zone 8		ELEVATION: 757.771m								
SAMPLE TYPE		<input checked="" type="checkbox"/> GRAB SAMPLE	<input type="checkbox"/> NO RECOVERY	<input checked="" type="checkbox"/> BULK	<input type="checkbox"/> CRREL CORE	<input type="checkbox"/> SHELBY TUBE	<input checked="" type="checkbox"/> GRAB CORE					
BACKFILL TYPE		<input checked="" type="checkbox"/> BENTONITE	<input type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input type="checkbox"/> SAND					
Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density(kg/m <sup>3</sup> )		PLASTIC M.C.		LIQUID		Slope Indicator	Elevation (m)
					20	40	60	80	20	40		
25	- trace sand	<input checked="" type="checkbox"/>	G15	- Ice and clay 70/30	1	1	1	1	1	1		732.0
26												731.0
27				- Ice and clay 50/50								730.0
28		<input checked="" type="checkbox"/>	G16									729.0
29		<input checked="" type="checkbox"/>	G17	- Ice and clay 70/30								728.0
30		<input checked="" type="checkbox"/>	G18	- Ice and clay 70/30								727.0
31				- Ice and clay 70/30								726.0
32		<input checked="" type="checkbox"/>	G19	- Ice and clay 70/30								725.0
33				- Ice and clay 50/50								724.0
34		<input checked="" type="checkbox"/>	G20	- Ice and clay 50/50								723.0
35				- Ice and clay 50/50								722.0
36		<input checked="" type="checkbox"/>	G21	- Ice and clay 50/50								721.0
37												720.0
38		<input checked="" type="checkbox"/>	G22									719.0
39	SAND (RESIDUUM) - gravelly, some cobbles, poorly graded, medium grained sand, brown											718.0
40	BEDROCK - light brown											717.0
41		<input checked="" type="checkbox"/>	G23									716.0
42		<input checked="" type="checkbox"/>	G24									715.0
43		<input checked="" type="checkbox"/>	G25									714.0
44	END OF BOREHOLE at 43.2 m - installed inclinometer to 715.4 m - azimuth of A+ direction is ____ °											713.0
45												712.0
46												711.0
47												710.0
48												709.0
49												708.0
50												707.0



**EBA Engineering Consultants Ltd.**

LOGGED BY: MD & KDJ	COMPLETION DEPTH: 43.2m
REVIEWED BY: BC & JGD	COMPLETE: 11/10/2010
DRAWING NO:	Page 2 of 2

Winter 2010 Instrumentation Program		Minto Explorations Ltd.		BOREHOLE NO: 10-DSI-9				
Dry Stack Tailings Storage Facility		Driftwood 3000 Diamond Drill-HQ Core		PROJECT NO: W14101068.001				
Minto Mine, YT		6945136N; 385762.9E; Zone 8		ELEVATION: 737.042m				
SAMPLE TYPE		<input checked="" type="checkbox"/> GRAB SAMPLE	<input type="checkbox"/> NO RECOVERY	<input checked="" type="checkbox"/> BULK	<input type="checkbox"/> CRREL CORE	<input type="checkbox"/> SHELBY TUBE	<input checked="" type="checkbox"/> GRAB CORE	
BACKFILL TYPE		<input checked="" type="checkbox"/> BENTONITE	<input type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input type="checkbox"/> SAND	
Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density(kg/m <sup>3</sup> )		Slope Indicator	Elevation (m)
					20 40 60 80	20 40 60 80		
					PLASTIC M.C.	LIQUID		
					20 40 60 80	20 40 60 80		
							◆ CLAY (%) ◆	
							20 40 60 80	
							● SILT (%) ●	
							20 40 60 80	
							▲ SAND (%) ▲	
							20 40 60 80	
							■ GRAVEL (%) ■	
							20 40 60 80	
0	NO RECOVERY							737.0
1	BEDROCK - greyish brown		G1					736.0
2								735.0
3								734.0
4								733.0
5			G2					732.0
6			G3					731.0
7	END OF BOREHOLE at 6.7 m - installed inclinometer to 731.5 m - azimuth of A+ direction is ____ m							730.0
8								729.0
9								728.0
10								



**EBA Engineering Consultants Ltd.**

LOGGED BY: KDJ	COMPLETION DEPTH: 6.7m
REVIEWED BY: BC & JGD	COMPLETE: 11/11/2010
DRAWING NO:	Page 1 of 1

Winter 2010 Instrumentation Program		Minto Explorations Ltd.		BOREHOLE NO: 10-DSI-10								
Dry Stack Tailings Storage Facility		Driftwood 3000 Diamond Drill-HQ Core		PROJECT NO: W14101068.001								
Minto Mine, YT		6944926N; 386115E; Zone 8		ELEVATION: 780.139m								
SAMPLE TYPE		<input checked="" type="checkbox"/> GRAB SAMPLE	<input type="checkbox"/> NO RECOVERY	<input checked="" type="checkbox"/> BULK	<input type="checkbox"/> CRREL CORE	<input type="checkbox"/> SHELBY TUBE	<input type="checkbox"/> GRAB CORE					
BACKFILL TYPE		<input type="checkbox"/> BENTONITE	<input type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input type="checkbox"/> SAND					
Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density (kg/m <sup>3</sup> )		PLASTIC M.C.		LIQUID		Slope Indicator	Elevation (m)
					20	40	60	80	20	40		
0	ROCK FILL - no recovery											780.0
1												779.0
2												778.0
3												777.0
4	ORGANICS - muskeg, rootlets SILT - sandy, non-plastic, brown, occasional organics		G1									776.0
5												775.0
6			G2									774.0
7												773.0
8												772.0
9	- some sand, greyish brown		G3	- Vx < 1%								771.0
10												770.0
11												769.0
12			G4									768.0
13	SILT (TILL) - sandy, trace clay, trace gravel, non-low plastic, frozen, brown											767.0
14												766.0
15			G5									765.0
16	SAND - trace silt, poorly graded, medium-coarse grained, angular, brown											764.0
17	SILT - some sand, trace gravel, non-plastic, dark brown, organic odor, frequent organic pieces (wood)		G6									763.0
18	SAND and SILT - some gravel, non-plastic, poorly graded, brownish grey, frequent organics, occasional cobbles		G7									762.0
19												761.0
20			G8									760.0
21			G9									759.0
22												758.0
23	- gravelly		G10	- ice lense, clear								757.0
24												756.0
25	- boulder		G11	- 100 mm ice lense - 250 mm ice lense								756.0



**EBA Engineering Consultants Ltd.**

LOGGED BY: MD	COMPLETION DEPTH: 87.8m
REVIEWED BY: BC & JGD	COMPLETE: 11/7/2010
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Winter 2010 Instrumentation Program		Minto Explorations Ltd.		BOREHOLE NO: 10-DSI-10											
Dry Stack Tailings Storage Facility		Driftwood 3000 Diamond Drill-HQ Core		PROJECT NO: W14101068.001											
Minto Mine, YT		6944926N; 386115E; Zone 8		ELEVATION: 780.139m											
SAMPLE TYPE		<input checked="" type="checkbox"/> GRAB SAMPLE	<input type="checkbox"/> NO RECOVERY	<input checked="" type="checkbox"/> BULK	<input type="checkbox"/> CRREL CORE	<input type="checkbox"/> SHELBY TUBE	<input checked="" type="checkbox"/> GRAB CORE								
BACKFILL TYPE		<input checked="" type="checkbox"/> BENTONITE	<input checked="" type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input checked="" type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input checked="" type="checkbox"/> SAND								
Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density(kg/m <sup>3</sup> )		CLAY (%)		SILT (%)		SAND (%)		GRAVEL (%)	Slope Indicator	Elevation (m)
					20	40	60	80	20	40	60	80			
25	SAND (TILL) - some silt, gravelly, poorly graded, subangular gravel, brown														755.0
26			G12												754.0
27	- gravel < 40 mm subangular-angular														753.0
28			G13												752.0
29			G14												751.0
30	- silty				- 100 mm ice lense, clear										750.0
31			G15		- Vr < 1%										749.0
32															748.0
33	- boulder SILT (TILL) - trace to some clay, trace sand, low plastic, dark grey														747.0
34			G16												746.0
35			G17												745.0
36			G18												744.0
37	- sandy, trace clay, trace gravel, low-non plastic, occasional cobble														743.0
38	- gravelly, subangular < 50 mm diameter														742.0
39			G19												741.0
40			G20												740.0
41	- frequent cobbles														739.0
42			G21												738.0
43			G22												737.0
44			G23												736.0
45			G24												735.0
46	- 300 mm boulder														734.0
47			G25												733.0
48			G26												732.0
49			G27												731.0
50	SILT AND SAND (TILL) - gravelly, trace clay, low-non plastic, dark														730.0
			G28		- Nbn, Vx < 1%										729.0



**EBA Engineering Consultants Ltd.**

LOGGED BY: MD	COMPLETION DEPTH: 87.8m
REVIEWED BY: BC & JGD	COMPLETE: 11/7/2010
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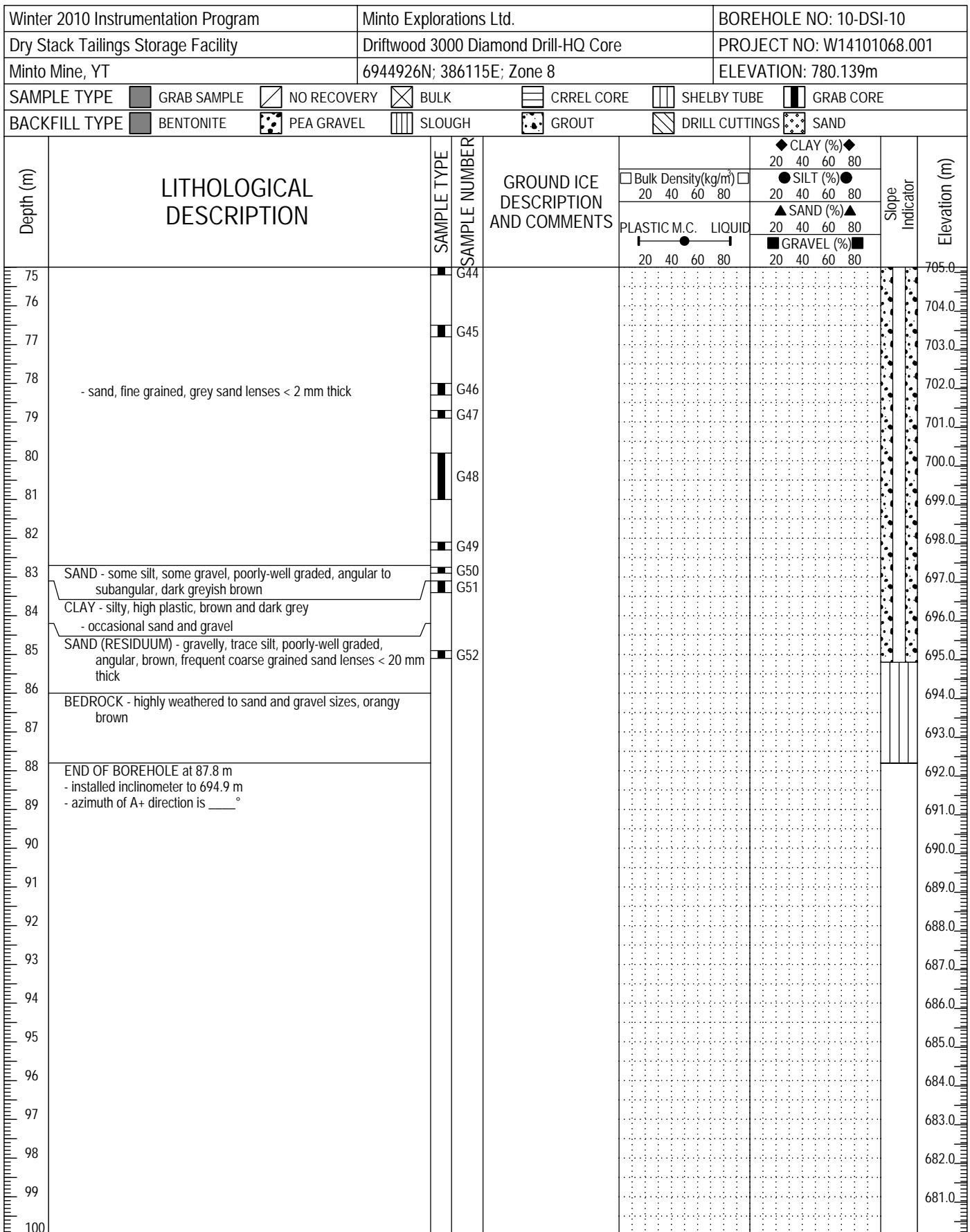


Winter 2010 Instrumentation Program		Minto Explorations Ltd.		BOREHOLE NO: 10-DSI-10				
Dry Stack Tailings Storage Facility		Driftwood 3000 Diamond Drill-HQ Core		PROJECT NO: W14101068.001				
Minto Mine, YT		6944926N; 386115E; Zone 8		ELEVATION: 780.139m				
SAMPLE TYPE		<input type="checkbox"/> GRAB SAMPLE	<input type="checkbox"/> NO RECOVERY	<input checked="" type="checkbox"/> BULK	<input type="checkbox"/> CRREL CORE	<input type="checkbox"/> SHELBY TUBE	<input type="checkbox"/> GRAB CORE	
BACKFILL TYPE		<input type="checkbox"/> BENTONITE	<input type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input type="checkbox"/> SAND	
Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density(kg/m <sup>3</sup> )		Slope Indicator	Elevation (m)
					PLASTIC M.C.	LIQUID		
					20 40 60 80	20 40 60 80		
					20 40 60 80	20 40 60 80		
					20 40 60 80	20 40 60 80		
					20 40 60 80	20 40 60 80		
50	grey, occasional cobbles							730.0
51		<input checked="" type="checkbox"/>	G29					729.0
52								728.0
53	SAND (TILL) - silty, gravelly, poorly graded, dark grey, occasional cobbles			- Nbe				727.0
54	- trace to some gravel	<input checked="" type="checkbox"/>	G30					726.0
55		<input checked="" type="checkbox"/>	G31					725.0
56								724.0
57	SILT AND SAND (TILL) - some gravel, low-non plastic, dark grey, occasional cobbles	<input checked="" type="checkbox"/>	G32	- Nbn				723.0
58		<input checked="" type="checkbox"/>	G33					722.0
59								721.0
60		<input checked="" type="checkbox"/>	G34	- Nbn, Vx < 1%				720.0
61				- Nbn				719.0
62		<input checked="" type="checkbox"/>	G35					718.0
63		<input checked="" type="checkbox"/>	G36					717.0
64	CLAY - silty, trace sand, trace gravel, medium plastic, dark grey, occasional fine grained sand pockets < 2 mm diameter	<input checked="" type="checkbox"/>	G37	- Nbn				716.0
65	- slickensided, no sand pockets, no gravel	<input checked="" type="checkbox"/>	G38					715.0
66								714.0
67	- sandy			- Nbn				713.0
68	- slickensided, medium-high plastic			- Nbn				712.0
69	- occasional light grey silt lenses < 4 mm thick	<input checked="" type="checkbox"/>	G39	- Nbn				711.0
70	- high plastic, occasional lighter grey silt pockets ~10 mm diameter	<input checked="" type="checkbox"/>	G40					710.0
71		<input checked="" type="checkbox"/>	G41					709.0
72	- stratified layers							708.0
73		<input checked="" type="checkbox"/>	G42					707.0
74	- high plastic, slickensided							706.0
75		<input checked="" type="checkbox"/>	G43					



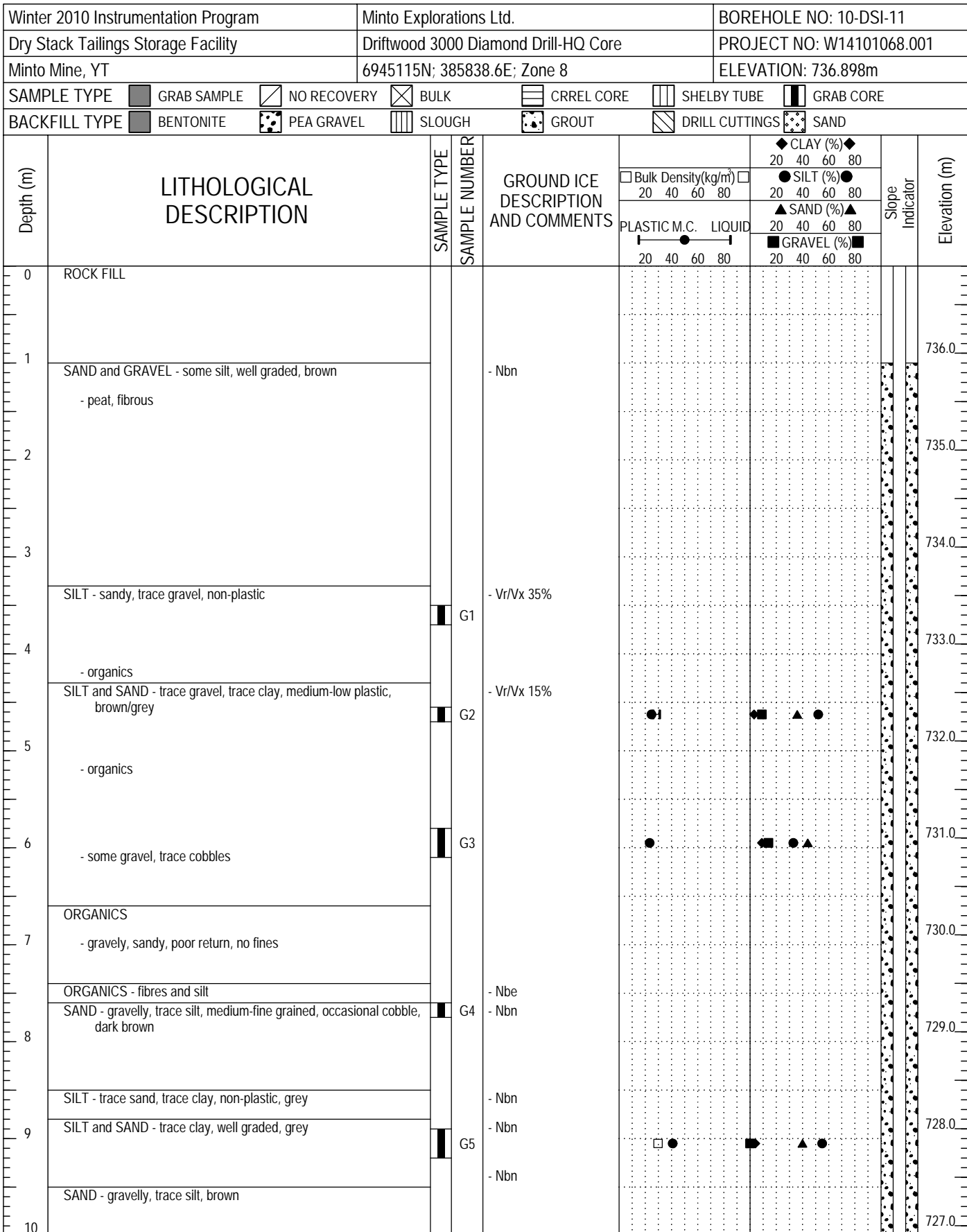
**EBA Engineering Consultants Ltd.**

LOGGED BY: MD	COMPLETION DEPTH: 87.8m
REVIEWED BY: BC & JGD	COMPLETE: 11/7/2010
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**EBA Engineering Consultants Ltd.**

LOGGED BY: MD	COMPLETION DEPTH: 87.8m
REVIEWED BY: BC & JGD	COMPLETE: 11/7/2010
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**EBA Engineering Consultants Ltd.**

LOGGED BY: JGD	COMPLETION DEPTH: 17.4m
REVIEWED BY: BC & JGD	COMPLETE: 11/15/2010
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Winter 2010 Instrumentation Program		Minto Explorations Ltd.		BOREHOLE NO: 10-DSI-11				
Dry Stack Tailings Storage Facility		Driftwood 3000 Diamond Drill-HQ Core		PROJECT NO: W14101068.001				
Minto Mine, YT		6945115N; 385838.6E; Zone 8		ELEVATION: 736.898m				
SAMPLE TYPE		<input checked="" type="checkbox"/> GRAB SAMPLE	<input type="checkbox"/> NO RECOVERY	<input checked="" type="checkbox"/> BULK	<input type="checkbox"/> CRREL CORE	<input type="checkbox"/> SHELBY TUBE	<input checked="" type="checkbox"/> GRAB CORE	
BACKFILL TYPE		<input checked="" type="checkbox"/> BENTONITE	<input type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input type="checkbox"/> SAND	
Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density(kg/m <sup>3</sup> )		Slope Indicator	Elevation (m)
					20 40 60 80	20 40 60 80		
					PLASTIC M.C.	LIQUID		
					20 40 60 80	20 40 60 80		
10								
11								726.0
12			G6					725.0
13	BEDROCK - granite with pegmatite inclusions, highly weathered							724.0
14								723.0
15								722.0
16								721.0
17								720.0
18	END OF BOREHOLE at 17.4 m - installed inclinometer to 720.2 m - azimuth of A+ direction is ____ m							719.0
19								718.0
20								717.0



**EBA Engineering Consultants Ltd.**

LOGGED BY: JGD	COMPLETION DEPTH: 17.4m
REVIEWED BY: BC & JGD	COMPLETE: 11/15/2010
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Winter 2010 Instrumentation Program		Minto Explorations Ltd.		BOREHOLE NO: 10-DST-6								
Dry Stack Tailings Storage Facility		Driftwood 3000 Diamond Drill-HQ Core		PROJECT NO: W14101068.001								
Minto Mine, YT		6944832.401N; 385729.963E; Zone 8		ELEVATION: 774.958m								
SAMPLE TYPE		<input checked="" type="checkbox"/> GRAB SAMPLE	<input type="checkbox"/> NO RECOVERY	<input checked="" type="checkbox"/> BULK	<input type="checkbox"/> CRREL CORE	<input type="checkbox"/> SHELBY TUBE	<input checked="" type="checkbox"/> GRAB CORE					
BACKFILL TYPE		<input checked="" type="checkbox"/> BENTONITE	<input type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input type="checkbox"/> SAND					
Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density(kg/m <sup>3</sup> )		PLASTIC M.C.		LIQUID		Thermistor	Elevation (m)
					20	40	60	80	20	40		
0	TAILINGS											
1				- Nbn, potential seasonal frost								
2												
3	SAND AND GRAVEL (FILL): trace silt, gravel < 40mm, subangular gravel, orangy brown TAILINGS			- Nbn								
4												
5												
6												
7												
8												
9												
10	SAND AND GRAVEL (FILL): trace silt, gravel < 20 mm, subangular gravel, orangy brown TAILINGS			- Nbn								
11												
12	ORGANICS: some silt, trace gravel, gravel subrounded, dark brown SAND: some silt, trace gravel, subrounded gravel, dark brown			- Nbn - Vr < 2%, lenses 1-2 mm thick								
13			G1									
14	- silty		G2									
15												



**EBA Engineering Consultants Ltd.**

LOGGED BY: JSB & MD

REVIEWED BY: JPB

DRAWING NO:

COMPLETION DEPTH: 20.7m

COMPLETE: 1/27/2010

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Winter 2010 Instrumentation Program		Minto Explorations Ltd.		BOREHOLE NO: 10-DST-6						
Dry Stack Tailings Storage Facility		Driftwood 3000 Diamond Drill-HQ Core		PROJECT NO: W14101068.001						
Minto Mine, YT		6944832.401N; 385729.963E; Zone 8		ELEVATION: 774.958m						
SAMPLE TYPE		<input checked="" type="checkbox"/> GRAB SAMPLE	<input type="checkbox"/> NO RECOVERY	<input checked="" type="checkbox"/> BULK	<input type="checkbox"/> CRREL CORE	<input type="checkbox"/> SHELBY TUBE	<input checked="" type="checkbox"/> GRAB CORE			
BACKFILL TYPE		<input checked="" type="checkbox"/> BENTONITE	<input type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input type="checkbox"/> SAND			
Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density(kg/m <sup>3</sup> )		PLASTIC M.C. LIQUID		Thermistor	Elevation (m)
					20	40	60	80		
15										
16										759.0
17										758.0
18	- organic inclusions, dark brown		G3							757.0
19	- gravelly, < 6 mm, subangular to angular		G4	- Vs < 5%, lenses < 2mm thick - Vc < 10%						756.0
20										755.0
21	END OF BOREHOLE at 20.7 m - backfilled with grout 20.7 m to surface - DST-6 beads between 778.3 m and 786.7 m (three beads above ground)									754.0
22										753.0
23										752.0
24										751.0
25										750.0
26										749.0
27										748.0
28										747.0
29										746.0
30										745.0



**EBA Engineering Consultants Ltd.**

LOGGED BY: JSB & MD	COMPLETION DEPTH: 20.7m
REVIEWED BY: JPB	COMPLETE: 1/27/2010
DRAWING NO:	Page 2 of 2

Winter 2010 Instrumentation Program		Minto Explorations Ltd.		BOREHOLE NO: 10-DST-7							
Dry Stack Tailings Storage Facility		Driftwood 3000 Diamond Drill-HQ Core		PROJECT NO: W14101068.001							
Minto Mine, YT		6944855.942N; 385482.201E; Zone 8		ELEVATION: 777.599m							
SAMPLE TYPE		<input type="checkbox"/> GRAB SAMPLE	<input type="checkbox"/> NO RECOVERY	<input type="checkbox"/> BULK	<input type="checkbox"/> CRREL CORE	<input type="checkbox"/> SHELBY TUBE	<input type="checkbox"/> GRAB CORE				
BACKFILL TYPE		<input type="checkbox"/> BENTONITE	<input type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input type="checkbox"/> SAND				
Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density(kg/m <sup>3</sup> )		PLASTIC M.C.		LIQUID		Thermistor	Elevation (m)
				20	40	60	80	20	40		
0	TAILINGS		- Nbn								777.0
1											776.0
2											775.0
3	- at 2.4 m, sandy silty, some gravel, angular to subangular, dark grey										774.0
4	ROCK FILL: gravelly, subrounded, medium to dark brown										773.0
5											772.0
6											771.0
7	SAND (TILL): some silt, gravelly, well graded, fine to medium grained, subrounded particles, dark grey										770.0
8											769.0
9	- some cobbles										768.0
10											767.0
11											766.0
12											765.0
13											764.0
14	- trace gravel, fine grained										763.0
15											



**EBA Engineering Consultants Ltd.**

LOGGED BY: JSB & MD	COMPLETION DEPTH: 28.3m
REVIEWED BY: JPB	COMPLETE: 1/28/2010
DRAWING NO:	Page 1 of 2



Winter 2010 Instrumentation Program		Minto Explorations Ltd.		BOREHOLE NO: 10-DST-7				
Dry Stack Tailings Storage Facility		Driftwood 3000 Diamond Drill-HQ Core		PROJECT NO: W14101068.001				
Minto Mine, YT		6944855.942N; 385482.201E; Zone 8		ELEVATION: 777.599m				
SAMPLE TYPE		<input type="checkbox"/> GRAB SAMPLE	<input type="checkbox"/> NO RECOVERY	<input type="checkbox"/> BULK	<input type="checkbox"/> CRREL CORE	<input type="checkbox"/> SHELBY TUBE	<input type="checkbox"/> GRAB CORE	
BACKFILL TYPE		<input type="checkbox"/> BENTONITE	<input type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input type="checkbox"/> SAND	
Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density(kg/m <sup>3</sup> )		CLAY (%)	Thermistor	Elevation (m)
				20 40 60 80	20 40 60 80	20 40 60 80		
				PLASTIC M.C.	LIQUID	SILT (%)		
				20 40 60 80	20 40 60 80	20 40 60 80		
						SAND (%)		
						20 40 60 80		
						GRAVEL (%)		
						20 40 60 80		
15								762.0
16	- some sand, some clay							761.0
17								760.0
18								759.0
19								758.0
20								757.0
21								756.0
22								755.0
23	- trace to no clay, gravel < 60 mm, dark greyish brown		- Vs, 100 mm thick ice lens					754.0
24			- Nbn					753.0
25								752.0
26								751.0
27								750.0
28								749.0
29	END OF BOREHOLE at 28.3 m - backfilled with grout from 28.3 m to 2.4 m - backfilled with tailings from 2.4 m to surface - DST-7 beads between 770.5 m and 750.5 m							748.0
30								



**EBA Engineering Consultants Ltd.**

LOGGED BY: JSB & MD	COMPLETION DEPTH: 28.3m
REVIEWED BY: JPB	COMPLETE: 1/28/2010
DRAWING NO:	Page 2 of 2

Winter 2010 Instrumentation Program		Minto Explorations Ltd.		BOREHOLE NO: 10-DST /P-3							
Dry Stack Tailings Storage Facility		Driftwood 3000 Diamond Drill-HQ Core		PROJECT NO: W14101068.001							
Minto Mine, YT		6944995.395N; 385750.646E; Zone 8		ELEVATION: 756.633m							
SAMPLE TYPE		<input checked="" type="checkbox"/> GRAB SAMPLE	<input type="checkbox"/> NO RECOVERY	<input checked="" type="checkbox"/> BULK	<input type="checkbox"/> CRREL CORE	<input type="checkbox"/> SHELBY TUBE	<input type="checkbox"/> GRAB CORE				
BACKFILL TYPE		<input type="checkbox"/> BENTONITE	<input type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input type="checkbox"/> SAND				
Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	<input type="checkbox"/> Bulk Density(kg/m <sup>3</sup> ) <input type="checkbox"/>		◆ CLAY (%) ◆ 20 40 60 80 ● SILT (%) ● 20 40 60 80 ▲ SAND (%) ▲ 20 40 60 80 ■ GRAVEL (%) ■ 20 40 60 80	Vibrating Wire	Vibrating Wire	Thermistor	Elevation (m)
					PLASTIC M.C.	LIQUID					
0	WASTE ROCK FILL										756.0
1											755.0
2											754.0
3	GRAVEL: sandy, silty, well graded sub-rounded gravel, medium to coarse grained angular sand, dark greyish brown										753.0
4											752.0
5	- at 4.5 m, gravel and sand										751.0
6			G1	- Nbn - Vx < 1-2%							750.0
7											749.0
8			G2								748.0
9	SILT (TILL): sandy, some gravel, subrounded gravel, dark greyish brown		G3	- Nbn - Vx < 2%							747.0
10			G4								746.0
11			G5	- from 10-10.1 m Vr < 10 mm thick							745.0
12			G6	- occasional ice lenses < 15 mm							744.0
13	END OF BOREHOLE at 12.3 m - backfilled with grout from 12.3 m to 2.1 m - backfilled with bentonite chips from 2.1 m to surface - DSP-3A tip elevation at 753.5 m - DSP-3B tip elevation at 752.8 m - DST-3 beads between 755.5 m and 744.5 m		G7								743.0
14											742.0
15											



**EBA Engineering Consultants Ltd.**

LOGGED BY: JSB & MD

REVIEWED BY: JPB

DRAWING NO:

COMPLETION DEPTH: 12.3m

COMPLETE: 1/22/2010

Page 1 of 1

Winter 2010 Instrumentation Program		Minto Explorations Ltd.		BOREHOLE NO: 10-DST/P-4					
Dry Stack Tailings Storage Facility		Driftwood 3000 Diamond Drill-HQ Core		PROJECT NO: W14101068.001					
Minto Mine, YT		6944927.605N; 385731.584E; Zone 8		ELEVATION: 773.141m					
SAMPLE TYPE		<input type="checkbox"/> GRAB SAMPLE	<input type="checkbox"/> NO RECOVERY	<input checked="" type="checkbox"/> BULK	<input type="checkbox"/> CRREL CORE	<input type="checkbox"/> SHELBY TUBE	<input type="checkbox"/> GRAB CORE		
BACKFILL TYPE		<input type="checkbox"/> BENTONITE	<input type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input type="checkbox"/> SAND		
Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	<input type="checkbox"/> Bulk Density(kg/m <sup>3</sup> ) <input type="checkbox"/> 20 40 60 80		<input checked="" type="checkbox"/> CLAY (%) <input checked="" type="checkbox"/> 20 40 60 80	Vibrating Wire Vibrating Wire Thermistor	Elevation (m)
					PLASTIC M.C. LIQUID 20 40 60 80	<input type="checkbox"/> SILT (%) <input type="checkbox"/> 20 40 60 80	<input type="checkbox"/> SAND (%) <input type="checkbox"/> 20 40 60 80		
0	WASTE ROCK FILL								773.0
1									772.0
2									771.0
3									770.0
4									769.0
5									768.0
6									767.0
7									766.0
8									765.0
9									764.0
10									763.0
11									762.0
12									761.0
13									760.0
14	Ground surface based on contour information, poor recovery								759.0
15									758.0
16									



**EBA Engineering Consultants Ltd.**

LOGGED BY: JSB & MD	COMPLETION DEPTH: 28.3m
REVIEWED BY: JPB	COMPLETE: 1/26/2010
DRAWING NO:	Page 1 of 2

Winter 2010 Instrumentation Program		Minto Explorations Ltd.		BOREHOLE NO: 10-DST/P-4										
Dry Stack Tailings Storage Facility		Driftwood 3000 Diamond Drill-HQ Core		PROJECT NO: W14101068.001										
Minto Mine, YT		6944927.605N; 385731.584E; Zone 8		ELEVATION: 773.141m										
SAMPLE TYPE		<input checked="" type="checkbox"/> GRAB SAMPLE	<input type="checkbox"/> NO RECOVERY	<input checked="" type="checkbox"/> BULK	<input type="checkbox"/> CRREL CORE	<input type="checkbox"/> SHELBY TUBE	<input checked="" type="checkbox"/> GRAB CORE							
BACKFILL TYPE		<input checked="" type="checkbox"/> BENTONITE	<input checked="" type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input checked="" type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input checked="" type="checkbox"/> SAND							
Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density (kg/m <sup>3</sup> )		PLASTIC M.C.		LIQUID		Vibrating Wire	Vibrating Wire	Thermistor	Elevation (m)
					20	40	60	80	20	40				
16														757.0
17	SAND: some silt, trace organics, fine grained, dark brown, slight organic odour			- Nbn - Vx < 1%										756.0
18	- no organics		G1	- Nbn										755.0
19	- some coarse grained sand, trace fine grained subangular gravel		G2	- Vx < 1.0% - Vr < 1-2%, lenses 1-5 mm thick										754.0
20	- cobbles < 120 mm		G3	- Vc < 20%										753.0
21														752.0
22														751.0
23	SAND (TILL): silty, gravelly, trace clay, gravel < 200 mm, gravel subangular and angular, dark greyish brown			- Nbn - Vr < 2.5%, lenses 1-2 mm thick										750.0
24			G4											749.0
25														748.0
26			G5	- Vc < 10%										747.0
27														746.0
28														745.0
29	END OF BOREHOLE at 28.3 m - core barrel left in ground from 25.3 m to 28.3 m - backfilled with grout from 28.3 m to 0.5 m - backfilled with bentonite chips from 0.5 m to surface - DSP-4A tip elevation at 755.2 m - DSP-4B tip elevation at 754.5 m - DST-4 beads between 773.1 m and 752.1 m													744.0
30														743.0
31														742.0
32														742.0



**EBA Engineering Consultants Ltd.**

LOGGED BY: JSB & MD

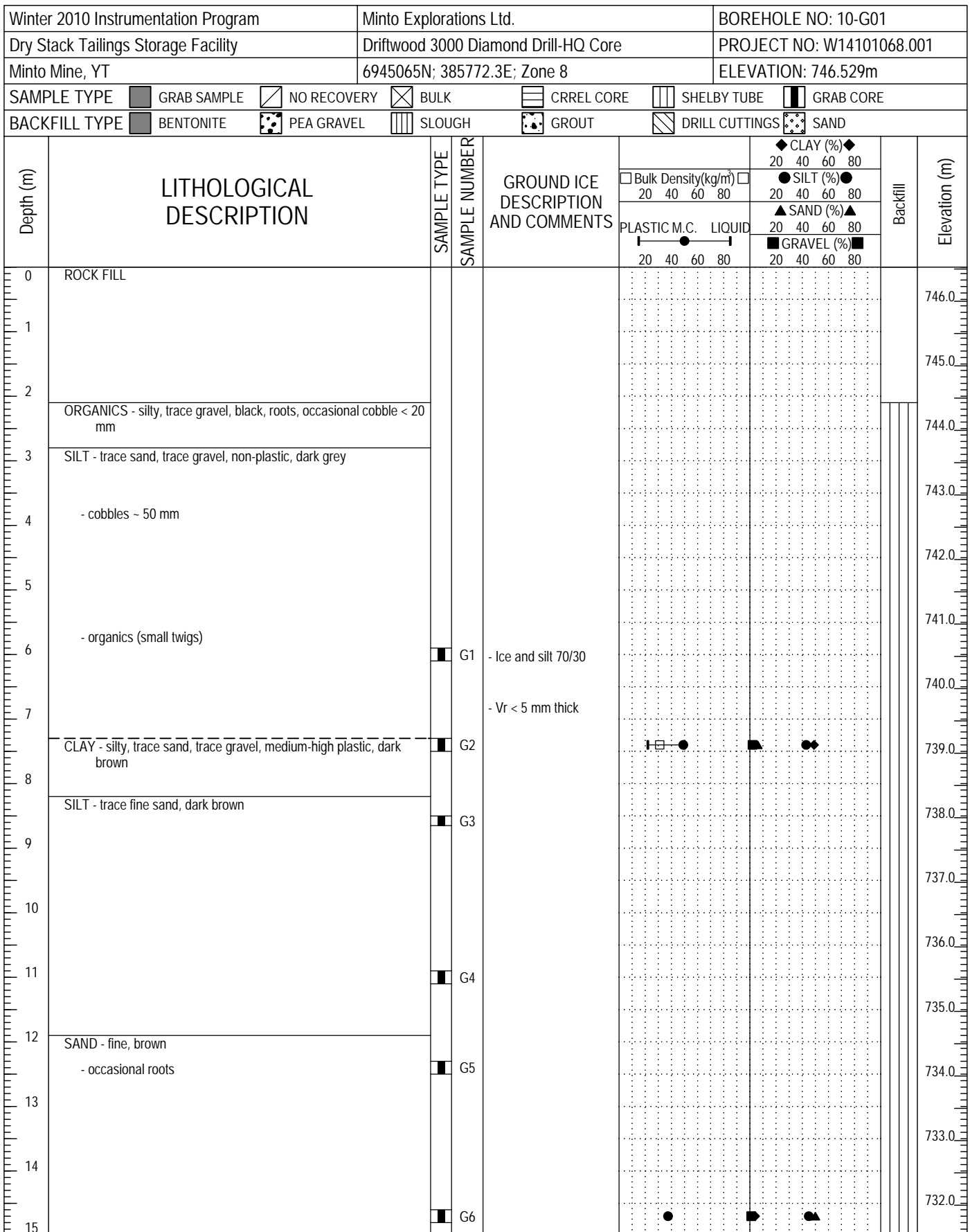
REVIEWED BY: JPB

DRAWING NO:

COMPLETION DEPTH: 28.3m

COMPLETE: 1/26/2010

Page 2 of 2



**EBA Engineering Consultants Ltd.**

LOGGED BY: KDJ	COMPLETION DEPTH: 22m
REVIEWED BY: BC & JGD	COMPLETE: 11/14/2010
DRAWING NO:	Page 1 of 2

Winter 2010 Instrumentation Program		Minto Explorations Ltd.		BOREHOLE NO: 10-G01						
Dry Stack Tailings Storage Facility		Driftwood 3000 Diamond Drill-HQ Core		PROJECT NO: W14101068.001						
Minto Mine, YT		6945065N; 385772.3E; Zone 8		ELEVATION: 746.529m						
SAMPLE TYPE		<input type="checkbox"/> GRAB SAMPLE	<input type="checkbox"/> NO RECOVERY	<input checked="" type="checkbox"/> BULK	<input type="checkbox"/> CRREL CORE	<input type="checkbox"/> SHELBY TUBE	<input type="checkbox"/> GRAB CORE			
BACKFILL TYPE		<input type="checkbox"/> BENTONITE	<input type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input type="checkbox"/> SAND			
Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density(kg/m <sup>3</sup> )		PLASTIC M.C. LIQUID		Backfill	Elevation (m)
					20 40 60 80	20 40 60 80	20 40 60 80	20 40 60 80		
15	BEDROCK - boulder then highly weathered, orangy brown	<input checked="" type="checkbox"/>	G7							731.0
16										730.0
17										729.0
18		<input checked="" type="checkbox"/>	G8							728.0
19										727.0
20										726.0
21										725.0
22	END OF BOREHOLE at 22.0 m									724.0
23										723.0
24										722.0
25										721.0
26										720.0
27										719.0
28										718.0
29										717.0
30										



**EBA Engineering Consultants Ltd.**

LOGGED BY: KDJ	COMPLETION DEPTH: 22m
REVIEWED BY: BC & JGD	COMPLETE: 11/14/2010
DRAWING NO:	Page 2 of 2

Winter 2010 Instrumentation Program		Minto Explorations Ltd.		BOREHOLE NO: 10-G02								
Dry Stack Tailings Storage Facility		Driftwood 3000 Diamond Drill-HQ Core		PROJECT NO: W14101068.001								
Minto Mine, YT		6945062N; 385856.1E; Zone 8		ELEVATION: 752.619m								
SAMPLE TYPE		GRAB SAMPLE	NO RECOVERY	BULK	CRREL CORE	SHELBY TUBE	GRAB CORE					
BACKFILL TYPE		BENTONITE	PEA GRAVEL	SLOUGH	GROUT	DRILL CUTTINGS	SAND					
Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density(kg/m <sup>3</sup> )		PLASTIC M.C.		LIQUID		Backfill	Elevation (m)
					20	40	60	80	20	40		
0	FILL - sand and gravel, trace fines, cobbles and boulders (waste rock)											752.0
1	ORGANIC SILT - some sand, dark brown		G1	- Nbn - Vs - Ice and silt, stratified layers ~10-15 mm thick								751.0
2												
3	SILT AND SAND - some clay, trace gravel, low to medium plastic, dark brown to grey		G2	- Vs 8-10 mm thick lenses - Ice and silt								750.0
4			G3									749.0
5	CLAY - silty, trace sand, trace gravel, medium to high plastic, brown to grey		G4	- Vr 20%								748.0
6												747.0
7	ICE AND CLAY - some silt, trace sand, medium to high plastic, grey		G5	- Vr/Vs 35 %								746.0
8			G6									745.0
9												744.0
10			G7									743.0
11			G8									742.0
12	CLAY - trace silt, trace sand, medium plastic, grey		G9									741.0
13												740.0
14												739.0
15			G10									738.0



**EBA Engineering Consultants Ltd.**

LOGGED BY: JGD & KDJ	COMPLETION DEPTH: 26.5m
REVIEWED BY: BC & JGD	COMPLETE: 11/15/2010
DRAWING NO:	Page 1 of 2



Winter 2010 Instrumentation Program		Minto Explorations Ltd.		BOREHOLE NO: 10-G02						
Dry Stack Tailings Storage Facility		Driftwood 3000 Diamond Drill-HQ Core		PROJECT NO: W14101068.001						
Minto Mine, YT		6945062N; 385856.1E; Zone 8		ELEVATION: 752.619m						
SAMPLE TYPE		<input type="checkbox"/> GRAB SAMPLE	<input type="checkbox"/> NO RECOVERY	<input checked="" type="checkbox"/> BULK	<input type="checkbox"/> CRREL CORE	<input type="checkbox"/> SHELBY TUBE	<input type="checkbox"/> GRAB CORE			
BACKFILL TYPE		<input type="checkbox"/> BENTONITE	<input type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input type="checkbox"/> SAND			
Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density(kg/m <sup>3</sup> )		PLASTIC M.C. LIQUID		Backfill	Elevation (m)
					20	40	60	80		
15		<input checked="" type="checkbox"/>	G11							737.0
16		<input checked="" type="checkbox"/>	G12							736.0
17	- trace fine gravel			-Vr 30%						735.0
18		<input checked="" type="checkbox"/>	G13	- Ice and clay 50/50						734.0
19										733.0
20	SAND - some gravel, some clay, poorly graded, fine grained gravel, medium grained sand, greyish brown, frozen	<input checked="" type="checkbox"/>	G14							732.0
21	CLAY - trace gravel, medium plastic, greyish brown	<input checked="" type="checkbox"/>	G15							731.0
22	SAND (RESIDUUM) - trace gravel, poorly graded, fine grained sand, brown									730.0
23	BEDROCK - grey	<input checked="" type="checkbox"/>	G16							729.0
24										728.0
25										727.0
26	- becomes reddish brown	<input checked="" type="checkbox"/>	G17							726.0
27	END OF BOREHOLE at 26.5 m									725.0
28										724.0
29										723.0
30										

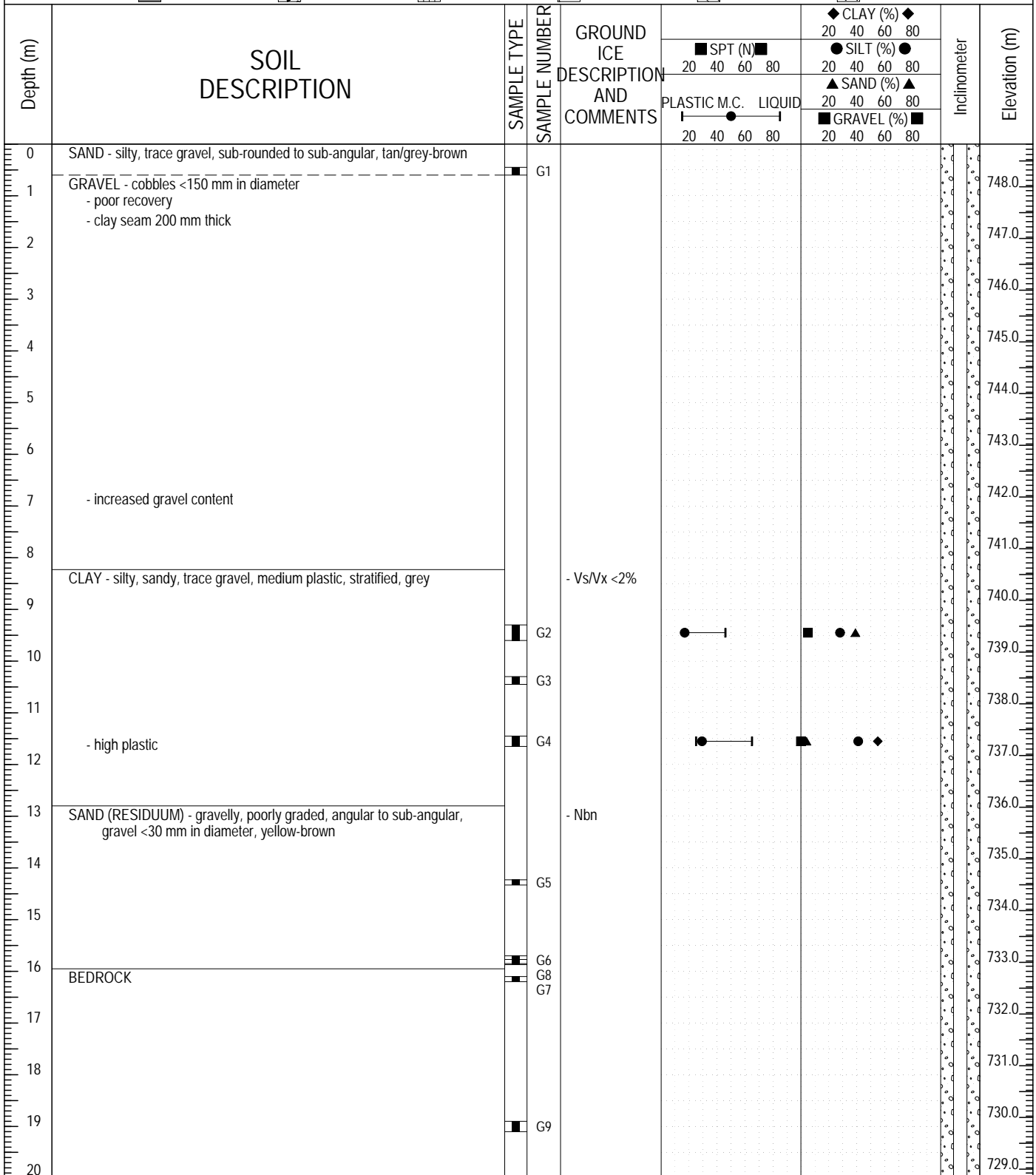



**EBA Engineering Consultants Ltd.**

LOGGED BY: JGD & KDJ	COMPLETION DEPTH: 26.5m
REVIEWED BY: BC & JGD	COMPLETE: 11/15/2010
DRAWING NO:	Page 2 of 2

Winter 2011 Geotechnical Drilling	CLIENT: Minto Explorations Ltd.	BOREHOLE NO: 11-DSI-12
Dry Stack Tailings Storage Facility	DRILL: 3000 Diamond Drill, HQ Core	PROJECT NO: W14101068.033
Minto Mine, YT	6945117.38N; 385981.036E; Zone 8	ELEVATION: 748.826m

SAMPLE TYPE	GRAB SAMPLE	NO RECOVERY	BULK	CRREL CORE	SHELBY TUBE	GRAB CORE
BACKFILL TYPE	BENTONITE	PEA GRAVEL	SLOUGH	GROUT	DRILL CUTTINGS	SAND




	LOGGED BY: AT & SMC	COMPLETION DEPTH: 37.19m
	REVIEWED BY: JGD	COMPLETE: 1/14/2011
	DRAWING NO:	Page 1 of 2

Winter 2011 Geotechnical Drilling	CLIENT: Minto Explorations Ltd.	BOREHOLE NO: 11-DSI-12
Dry Stack Tailings Storage Facility	DRILL: 3000 Diamond Drill, HQ Core	PROJECT NO: W14101068.033
Minto Mine, YT	6945117.38N; 385981.036E; Zone 8	ELEVATION: 748.826m

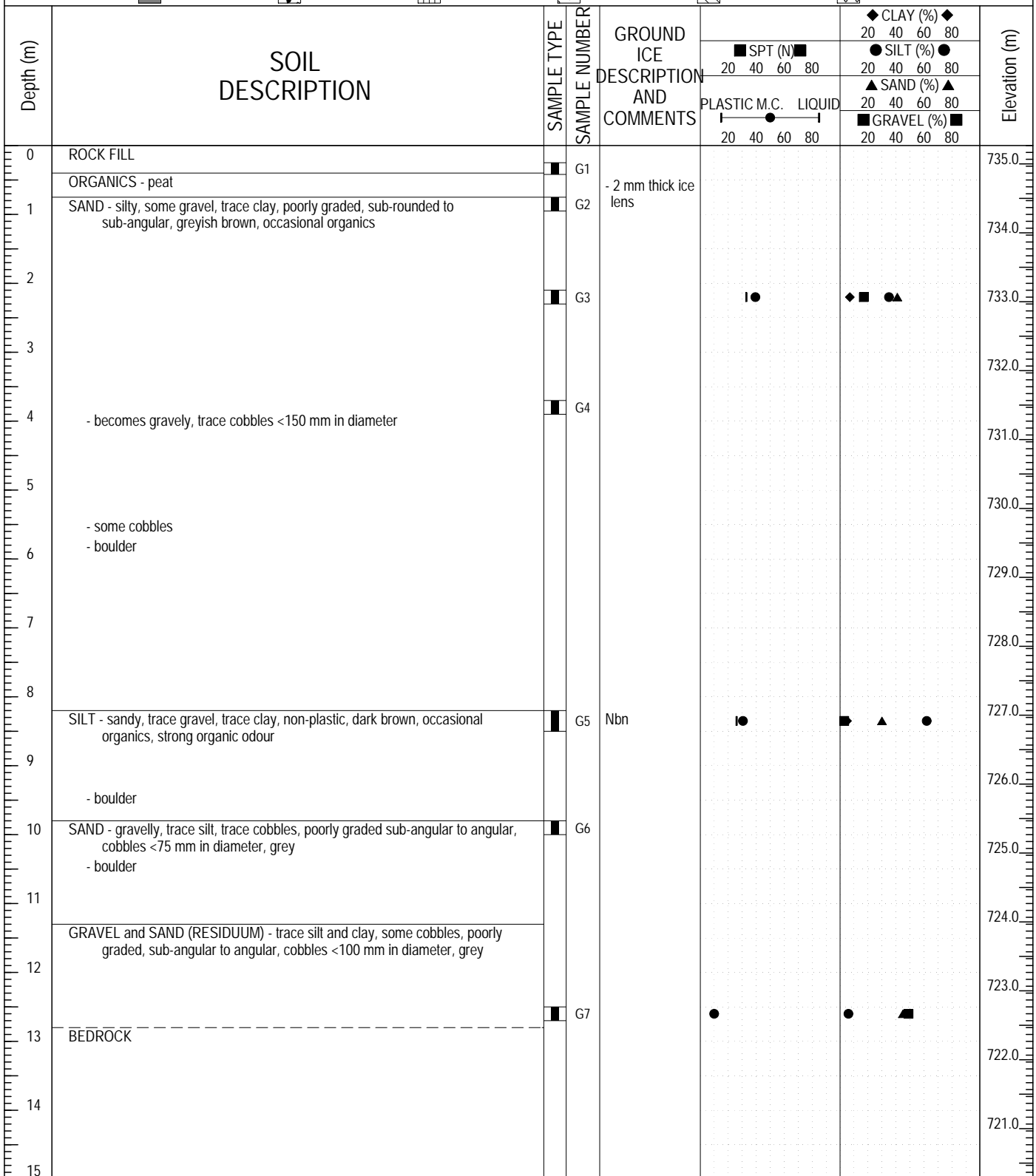
SAMPLE TYPE	<input type="checkbox"/> GRAB SAMPLE	<input type="checkbox"/> NO RECOVERY	<input type="checkbox"/> BULK	<input type="checkbox"/> CRREL CORE	<input type="checkbox"/> SHELBY TUBE	<input type="checkbox"/> GRAB CORE
BACKFILL TYPE	<input type="checkbox"/> BENTONITE	<input type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input type="checkbox"/> SAND


Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	SPT (N)		PLASTIC M.C.		LIQUID		Inclinometer	Elevation (m)
					20	40	20	40	60	80		
20												728.0
21												727.0
22			G10 G11									726.0
23												725.0
24			G12									724.0
25			G13									723.0
26												722.0
27												721.0
28												720.0
29												719.0
30												718.0
31												717.0
32												716.0
33												715.0
34												714.0
35												713.0
36												712.0
37												711.0
38	END OF BOREHOLE @ 37.2 m - CONFIRMED BEDROCK											710.0
39												709.0
40												709.0

 A TETRA TECH COMPANY	LOGGED BY: AT & SMC	COMPLETION DEPTH: 37.19m
	REVIEWED BY: JGD	COMPLETE: 1/14/2011
	DRAWING NO:	Page 2 of 2

Winter 2011 Geotechnical Drilling	CLIENT: Minto Explorations Ltd.	BOREHOLE NO: 11-G01
Dry Stack Tailings Storage Facility	DRILL: 3000 Diamond Drill, HQ Core	PROJECT NO: W14101068.033
Minto Mine, YT	6945149.321N; 3856934E; Zone 8	ELEVATION: 735.267m

SAMPLE TYPE	GRAB SAMPLE	NO RECOVERY	BULK	CRREL CORE	SHELBY TUBE	GRAB CORE
BACKFILL TYPE	BENTONITE	PEA GRAVEL	SLOUGH	GROUT	DRILL CUTTINGS	SAND




	LOGGED BY: AT & SMC	COMPLETION DEPTH: 21.95m
	REVIEWED BY: JGD	COMPLETE: 1/11/2011
	DRAWING NO:	Page 1 of 2

Winter 2011 Geotechnical Drilling	CLIENT: Minto Explorations Ltd.	BOREHOLE NO: 11-G01
Dry Stack Tailings Storage Facility	DRILL: 3000 Diamond Drill, HQ Core	PROJECT NO: W14101068.033
Minto Mine, YT	6945149.321N; 3856934E; Zone 8	ELEVATION: 735.267m

SAMPLE TYPE	<input type="checkbox"/> GRAB SAMPLE	<input type="checkbox"/> NO RECOVERY	<input type="checkbox"/> BULK	<input type="checkbox"/> CRREL CORE	<input type="checkbox"/> SHELBY TUBE	<input type="checkbox"/> GRAB CORE
BACKFILL TYPE	<input type="checkbox"/> BENTONITE	<input type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input type="checkbox"/> SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	SPT (N)		PLASTIC M.C. LIQUID		CLAY (%)		SILT (%)		SAND (%)		GRAVEL (%)		Elevation (m)
					20	40	60	80	20	40	60	80	20	40	60	80	
15			G8														720.0
16			G9														719.0
17																	718.0
18																	717.0
19			G10														716.0
20																	715.0
21																	714.0
22	END OF BOREHOLE @ 22.0 m - CONFIRMED BEDROCK																713.0
23																	712.0
24																	711.0
25																	710.0
26																	709.0
27																	708.0
28																	707.0
29																	706.0
30																	

 A TETRA TECH COMPANY	LOGGED BY: AT & SMC	COMPLETION DEPTH: 21.95m
	REVIEWED BY: JGD	COMPLETE: 1/11/2011
	DRAWING NO:	Page 2 of 2

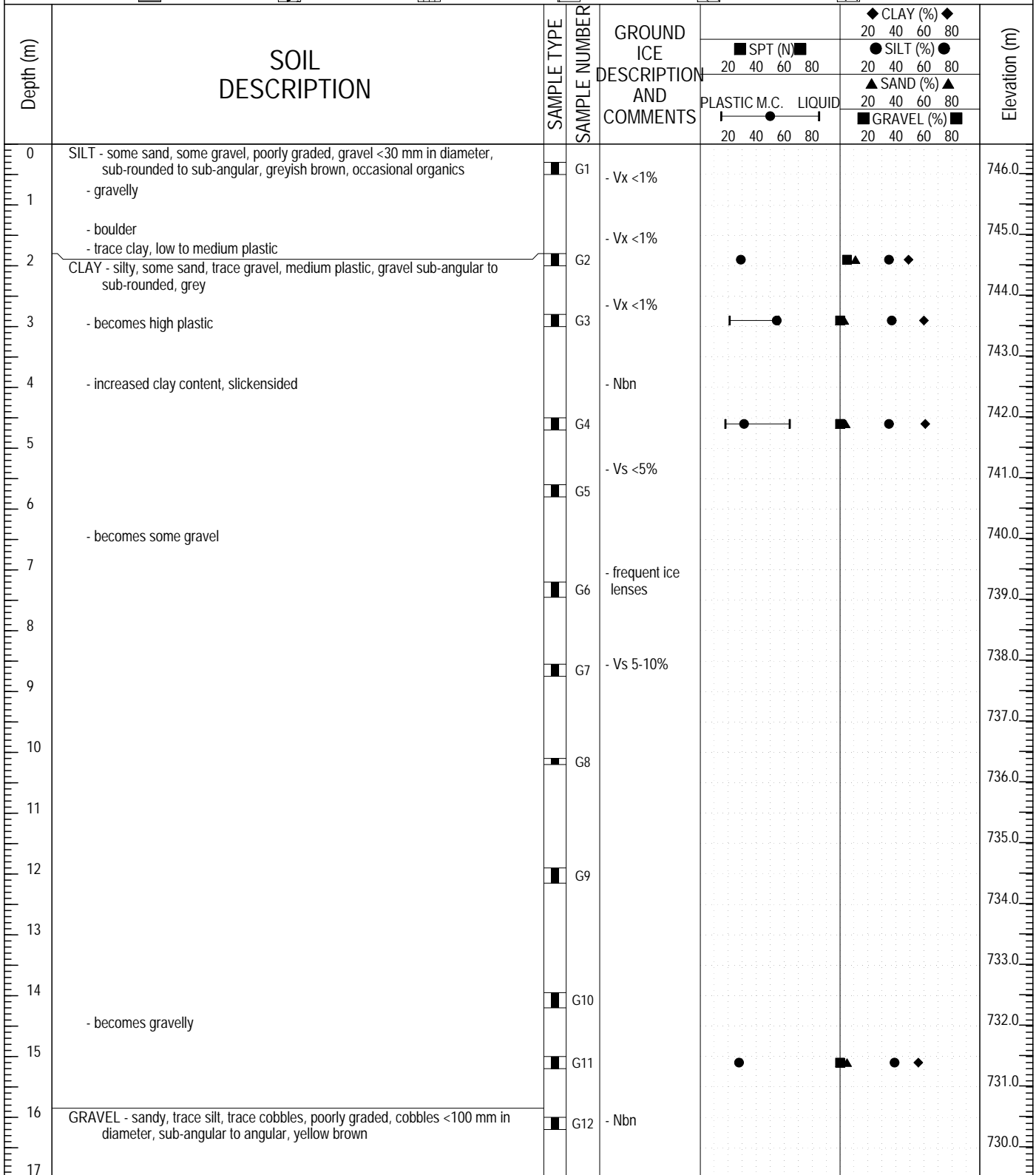
Winter 2011 Geotechnical Drilling		CLIENT: Minto Explorations Ltd.		BOREHOLE NO: 11-G08													
Dry Stack Tailings Storage Facility		DRILL: 3000 Diamond Drill, HQ Core		PROJECT NO: W14101068.033													
Minto Mine, YT		6945210.147N; 386049.964E; Zone 8		ELEVATION: 730.693m													
SAMPLE TYPE		GRAB SAMPLE	NO RECOVERY	BULK	CRREL CORE	SHELBY TUBE	GRAB CORE										
BACKFILL TYPE		BENTONITE	PEA GRAVEL	SLOUGH	GROUT	DRILL CUTTINGS	SAND										
Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	SPT (N)		PLASTIC M.C. LIQUID		CLAY (%)		SILT (%)		SAND (%)		GRAVEL (%)		Elevation (m)
					20	40	60	80	20	40	60	80	20	40	60	80	
0	ORGANICS - peat, gravelly CLAY - silty, sandy, trace gravel, medium plastic, dark brown, occasional roots	■	G1	- Nbn, Vx <1%													730.0
1	- no roots	■	G2	- Nbn, Vx <3%, Vr <10%													729.0
2																	728.0
3		■	G3	- Nbn, Vx <1%, Vr <1%													727.0
4	SILT and SAND - some gravel, trace cobbles, non plastic, dark brown			- Nbn, Vx <1%, Vr													726.0
5	CLAY - silty, sandy, gravelly, non plastic, dark brown, foul odour, abundant organics	■	G4	- Vr													725.0
6		■	G5														724.0
7	SAND (RESIDUUM) - gravelly, trace silt and clay, sub-angular to angular, brown			- Nbn to Nbe, Vx <4%													723.0
8	- becomes more coarse and angular - light brown to orange	■	G6	- Nbn to Nbe													722.0
9	BEDROCK - highly weathered, angular																721.0
10	- bedrock becomes more competent			- 10 mm thick ice lens, clear													720.0
11																	719.0
12																	718.0
13																	717.0
14	END OF BOREHOLE @ 13.4 m - CONFIRMED BEDROCK																716.0
15																	



LOGGED BY: AT & SMC	COMPLETION DEPTH: 13.4m
REVIEWED BY: JGD	COMPLETE: 1/12/2011
DRAWING NO:	Page 1 of 1

Winter 2011 Geotechnical Drilling	CLIENT: Minto Explorations Ltd.	BOREHOLE NO: 11-G09
Dry Stack Tailings Storage Facility	DRILL: 3000 Diamond Drill, HQ Core	PROJECT NO: W14101068.033
Minto Mine, YT	6945164.655N; 386080.323E; Zone 8	ELEVATION: 746.484m

SAMPLE TYPE	GRAB SAMPLE	NO RECOVERY	BULK	CRREL CORE	SHELBY TUBE	GRAB CORE
BACKFILL TYPE	BENTONITE	PEA GRAVEL	SLOUGH	GROUT	DRILL CUTTINGS	SAND




	LOGGED BY: AT & SMC	COMPLETION DEPTH: 31.1m
	REVIEWED BY: JGD	COMPLETE: 1/12/2011
	DRAWING NO:	Page 1 of 2



Winter 2011 Geotechnical Drilling	CLIENT: Minto Explorations Ltd.	BOREHOLE NO: 11-G09
Dry Stack Tailings Storage Facility	DRILL: 3000 Diamond Drill, HQ Core	PROJECT NO: W14101068.033
Minto Mine, YT	6945164.655N; 386080.323E; Zone 8	ELEVATION: 746.484m

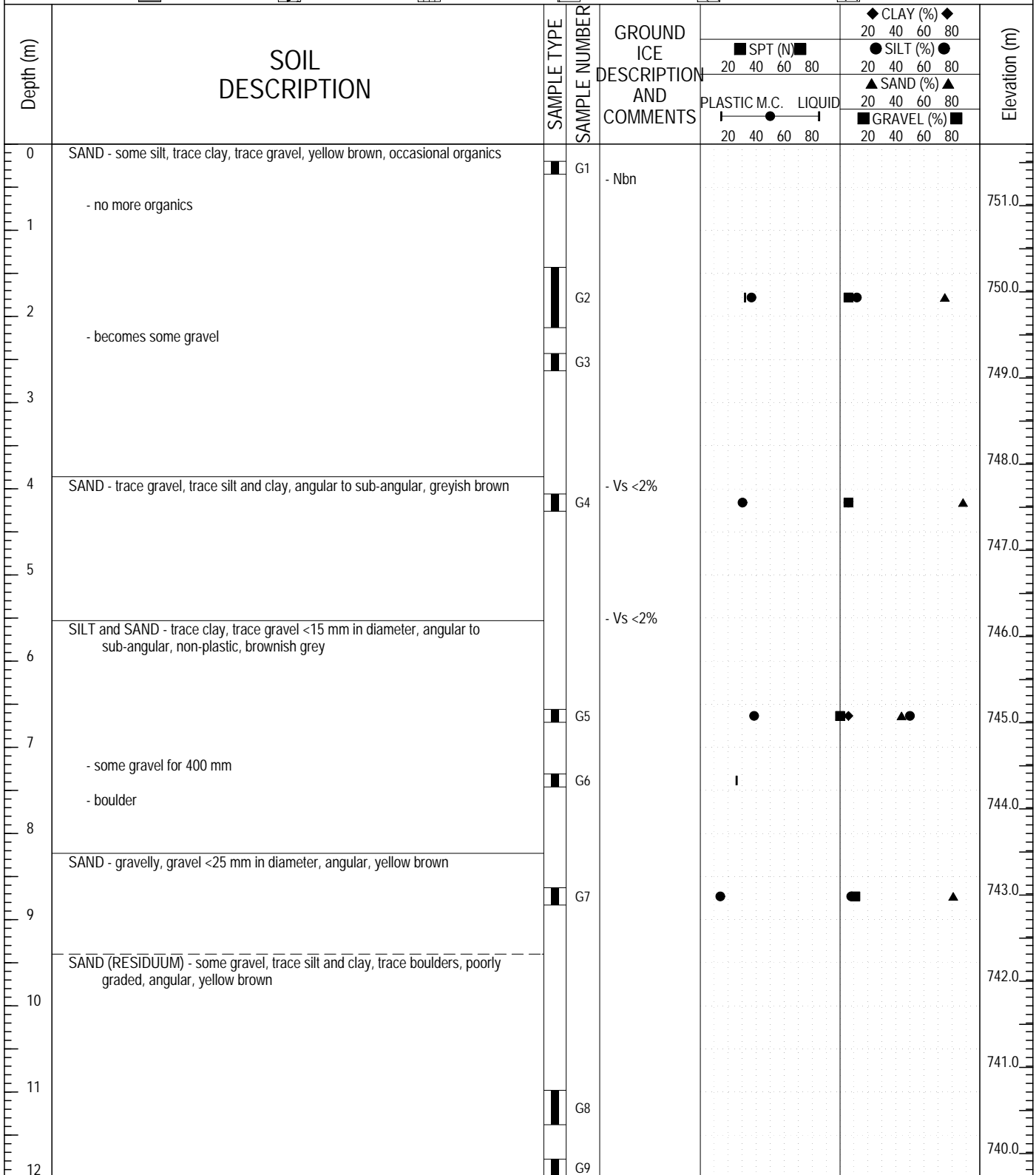
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BACKFILL TYPE	<input type="checkbox"/> BENTONITE	<input type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input type="checkbox"/> SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	SPT (N)		PLASTIC M.C.		CLAY (%)		SILT (%)		SAND (%)		GRAVEL (%)		Elevation (m)	
					20	40	20	40	20	40	20	40	20	40	20	40		20
17	SAND (RESIDUUM) - gravelly, trace silt, poorly graded, gravel <30 mm in diameter, sub-angular to angular  - angular	█	G13	- Nbn														729.0
18																		728.0
19																		727.0
20																		726.0
21																		725.0
22																		724.0
23																		723.0
24	BEDROCK - highly weathered																	722.0
25																		721.0
26																		720.0
27																		719.0
28	- rock becomes more competent	█	G15															718.0
29	717.0																	
30	716.0																	
31	END OF BOREHOLE @ 31.1 m - CONFIRMED BEDROCK																	715.0
32																		714.0
33																		713.0
34																		

	LOGGED BY: AT & SMC	COMPLETION DEPTH: 31.1m
	REVIEWED BY: JGD	COMPLETE: 1/12/2011
	DRAWING NO:	Page 2 of 2

Winter 2011 Geotechnical Drilling	CLIENT: Minto Explorations Ltd.	BOREHOLE NO: 11-G10
Dry Stack Tailings Storage Facility	DRILL: 3000 Diamond Drill, HQ Core	PROJECT NO: W14101068.033
Minto Mine, YT	6945102.749N; 385514.177E; Zone 8	ELEVATION: 751.715m

SAMPLE TYPE	GRAB SAMPLE	NO RECOVERY	BULK	CRREL CORE	SHELBY TUBE	GRAB CORE
BACKFILL TYPE	BENTONITE	PEA GRAVEL	SLOUGH	GROUT	DRILL CUTTINGS	SAND

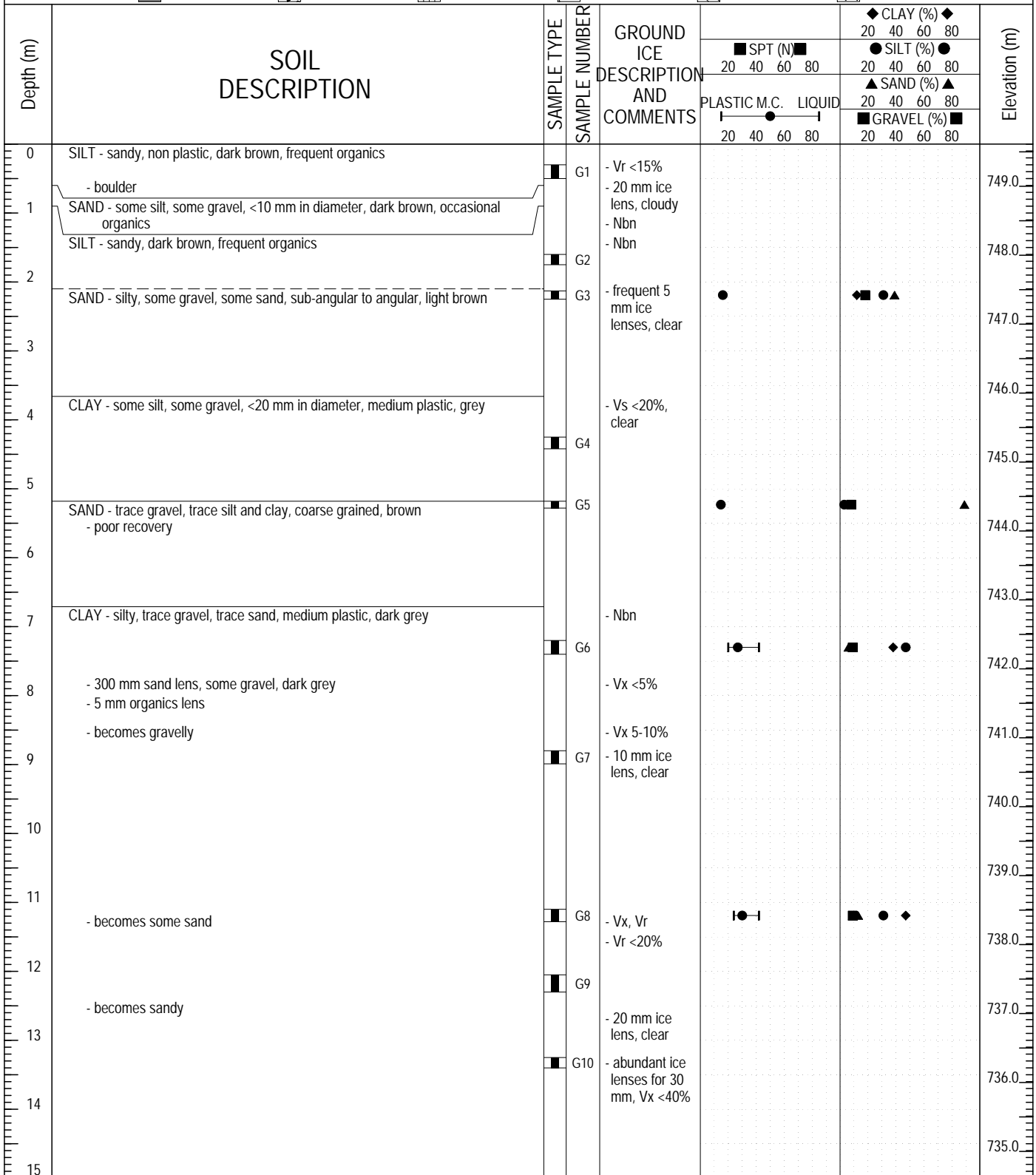


	LOGGED BY: AT & SMC	COMPLETION DEPTH: 21.95m
	REVIEWED BY: JGD	COMPLETE: 1/16/2011
	DRAWING NO:	Page 1 of 2

Winter 2011 Geotechnical Drilling		CLIENT: Minto Explorations Ltd.		BOREHOLE NO: 11-G10							
Dry Stack Tailings Storage Facility		DRILL: 3000 Diamond Drill, HQ Core		PROJECT NO: W14101068.033							
Minto Mine, YT		6945102.749N; 385514.177E; Zone 8		ELEVATION: 751.715m							
SAMPLE TYPE <input type="checkbox"/> GRAB SAMPLE <input type="checkbox"/> NO RECOVERY <input type="checkbox"/> BULK <input type="checkbox"/> CRREL CORE <input type="checkbox"/> SHELBY TUBE <input type="checkbox"/> GRAB CORE											
BACKFILL TYPE <input type="checkbox"/> BENTONITE <input type="checkbox"/> PEA GRAVEL <input type="checkbox"/> SLOUGH <input type="checkbox"/> GROUT <input type="checkbox"/> DRILL CUTTINGS <input type="checkbox"/> SAND											
Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	SPT (N)		PLASTIC M.C.		LIQUID		Elevation (m)
					20	40	20	40	60	80	
12											739.0
13											738.0
14	- some cobbles and boulders		G10								737.0
15											736.0
16	- becomes trace silt										735.0
17	BEDROCK - weathered		G11								734.0
18											733.0
19	- bedrock more competent		G12								732.0
20											731.0
21											730.0
22	END OF BOREHOLE @ 21.9 m - CONFIRMED BEDROCK										729.0
23											728.0
24											

Winter 2011 Geotechnical Drilling	CLIENT: Minto Explorations Ltd.	BOREHOLE NO: 11-G11
Dry Stack Tailings Storage Facility	DRILL: 3000 Diamond Drill, HQ Core	PROJECT NO: W14101068.033
Minto Mine, YT	6945094.013N; 385571.438E; Zone 8	ELEVATION: 749.612m

SAMPLE TYPE	GRAB SAMPLE	NO RECOVERY	BULK	CRREL CORE	SHELBY TUBE	GRAB CORE
BACKFILL TYPE	BENTONITE	PEA GRAVEL	SLOUGH	GROUT	DRILL CUTTINGS	SAND



	LOGGED BY: AT & SMC	COMPLETION DEPTH: 26.52m
	REVIEWED BY: JGD	COMPLETE: 1/17/2011
	DRAWING NO:	Page 1 of 2

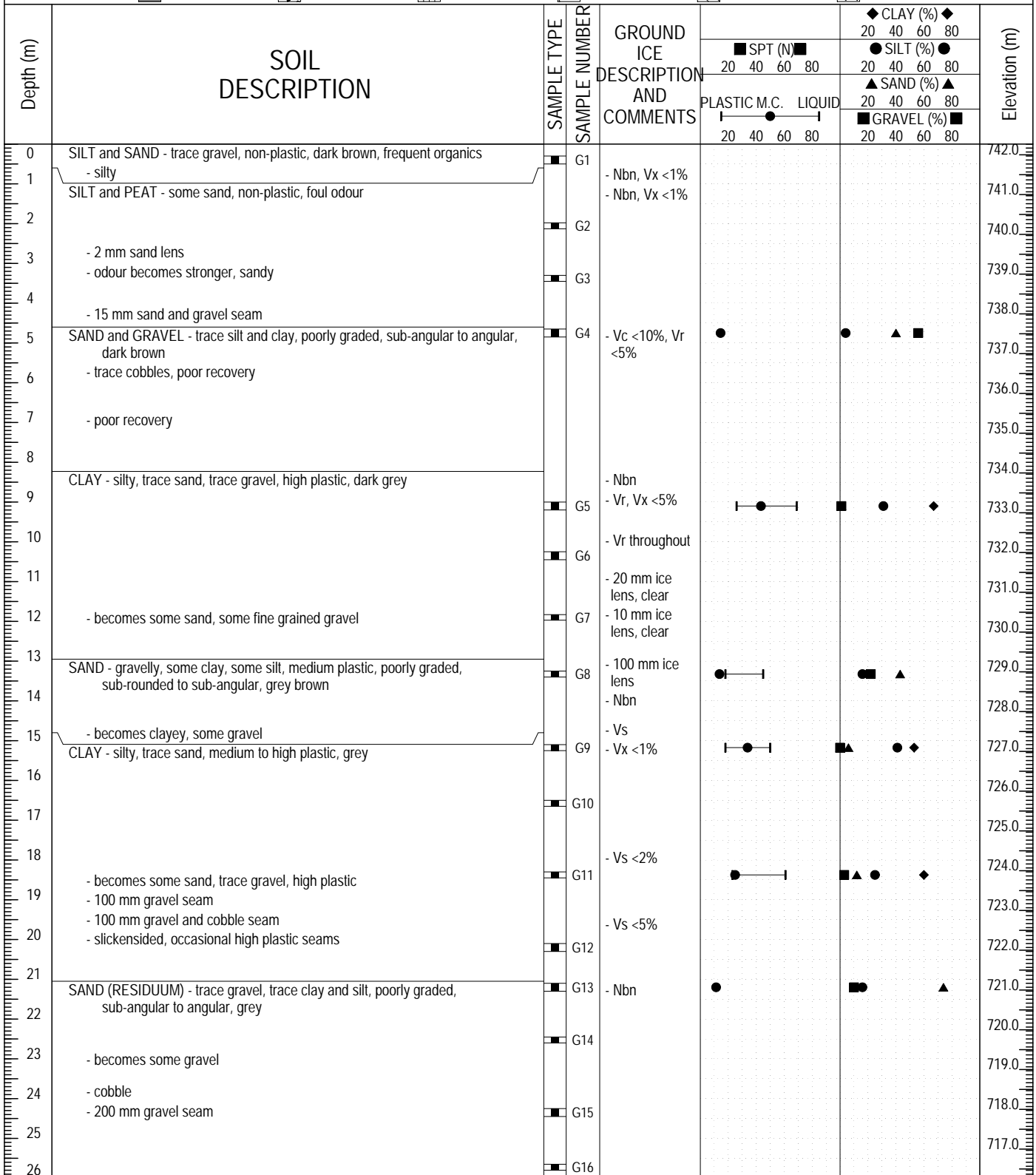
Winter 2011 Geotechnical Drilling		CLIENT: Minto Explorations Ltd.		BOREHOLE NO: 11-G11							
Dry Stack Tailings Storage Facility		DRILL: 3000 Diamond Drill, HQ Core		PROJECT NO: W14101068.033							
Minto Mine, YT		6945094.013N; 385571.438E; Zone 8		ELEVATION: 749.612m							
SAMPLE TYPE		GRAB SAMPLE	NO RECOVERY	BULK	CRREL CORE	SHELBY TUBE	GRAB CORE				
BACKFILL TYPE		BENTONITE	PEA GRAVEL	SLOUGH	GROUT	DRILL CUTTINGS	SAND				
Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	SPT (N)		PLASTIC M.C. LIQUID		CLAY (%)		Elevation (m)
					20	40	60	80	20	40	
15											734.0
16	- some silt, trace to some gravel, medium plastic			- Nbn, Vs - 20 mm ice lens, clear							733.0
17	- becomes trace sand  - becomes some gravel and sand	█	G11								732.0
18	SAND - some silt, some gravel, light reddish brown			- Nbn							731.0
18	SILT - sandy, some gravel, trace clay, <10 mm in diameter, sub-angular to angular, non to low plastic, brown	█	G12	- Vs							730.0
19				- Vx <1% - 5 mm thick ice lens, clear							729.0
20	SAND - silty, trace gravel, trace clay, non to low plastic, brown	█	G13								728.0
21											727.0
22	SAND (RESIDUUM)										726.0
23	BEDROCK										725.0
24											724.0
25											723.0
26											722.0
27	END OF BOREHOLE @ 26.5 m - CONFIRMED BEDROCK										721.0
28											720.0
29											720.0
30											720.0




LOGGED BY: AT & SMC	COMPLETION DEPTH: 26.52m
REVIEWED BY: JGD	COMPLETE: 1/17/2011
DRAWING NO:	Page 2 of 2

Winter 2011 Geotechnical Drilling	CLIENT: Minto Explorations Ltd.	BOREHOLE NO: 11-G13
Dry Stack Tailings Storage Facility	DRILL: 3000 Diamond Drill, HQ Core	PROJECT NO: W14101068.033
Minto Mine, YT	6945191.54N; 386140.942E; Zone 8	ELEVATION: 742.269m

SAMPLE TYPE	GRAB SAMPLE	NO RECOVERY	BULK	CRREL CORE	SHELBY TUBE	GRAB CORE
BACKFILL TYPE	BENTONITE	PEA GRAVEL	SLOUGH	GROUT	DRILL CUTTINGS	SAND



	LOGGED BY: AT & SMC	COMPLETION DEPTH: 49.38m
	REVIEWED BY: JGD	COMPLETE: 1/13/2011
	DRAWING NO:	Page 1 of 2

Winter 2011 Geotechnical Drilling		CLIENT: Minto Explorations Ltd.		BOREHOLE NO: 11-G13							
Dry Stack Tailings Storage Facility		DRILL: 3000 Diamond Drill, HQ Core		PROJECT NO: W14101068.033							
Minto Mine, YT		6945191.54N; 386140.942E; Zone 8		ELEVATION: 742.269m							
<b>SAMPLE TYPE</b> <input type="checkbox"/> GRAB SAMPLE <input type="checkbox"/> NO RECOVERY <input type="checkbox"/> BULK <input type="checkbox"/> CRREL CORE <input type="checkbox"/> SHELBY TUBE <input type="checkbox"/> GRAB CORE											
<b>BACKFILL TYPE</b> <input type="checkbox"/> BENTONITE <input type="checkbox"/> PEA GRAVEL <input type="checkbox"/> SLOUGH <input type="checkbox"/> GROUT <input type="checkbox"/> DRILL CUTTINGS <input type="checkbox"/> SAND											
Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	SPT (N)		PLASTIC M.C.		LIQUID		Elevation (m)
					20	40	60	80	20	40	
26	- gravel <50 mm										716.0
27											715.0
28			G17								714.0
29											713.0
30			G18								712.0
31	- becomes gravelly, brown										711.0
32	- 100 mm cobble		G19								710.0
33	- cobble		G20								710.0
34	- becomes coarse grained										709.0
35	- abundant cobbles and boulders		G21								708.0
36			G22								707.0
37			G23								706.0
38	BEDROCK - highly fractured, silt and gravel filled joints		G24								705.0
39											704.0
40			G25								703.0
41											702.0
42											701.0
43											700.0
44	- 500 mm sand seam, trace gravel, angular		G26								699.0
45											698.0
46	- rock becomes more competent										697.0
47											696.0
48											695.0
49											694.0
50	END OF BOREHOLE @ 49.4 m - CONFIRMED BEDROCK										693.0
51											692.0
52											691.0



LOGGED BY: AT & SMC	COMPLETION DEPTH: 49.38m
REVIEWED BY: JGD	COMPLETE: 1/13/2011
DRAWING NO:	Page 2 of 2



Winter 2010 Instrumentation Program		Minto Explorations Ltd.		BOREHOLE NO: 10-MDI-1				
Main Waste Dump		Driftwood 3000 Diamond Drill-HQ Core		PROJECT NO: W14101068.008				
Minto Mine, YT		6944923.137N; 384117.207E; Zone 8		ELEVATION: 858.6001m				
SAMPLE TYPE		<input type="checkbox"/> GRAB SAMPLE	<input type="checkbox"/> NO RECOVERY	<input type="checkbox"/> BULK	<input type="checkbox"/> CRREL CORE	<input type="checkbox"/> SHELBY TUBE	<input type="checkbox"/> GRAB CORE	
BACKFILL TYPE		<input type="checkbox"/> BENTONITE	<input type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input type="checkbox"/> SAND	
Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density(kg/m <sup>3</sup> )		CLAY (%)	Slope Indicator	Elevation (m)
				20 40 60 80	20 40 60 80	20 40 60 80		
				PLASTIC M.C.	LIQUID	SILT (%)		
				20 40 60 80	20 40 60 80	20 40 60 80		
						GRAVEL (%)		
						20 40 60 80		
0	WASTE ROCK FILL							858.0
1								857.0
2								856.0
3	SAND (TILL): silty, some gravel, poorly graded, medium grained sand, trace cobbles < 80 mm, angular, brown, slightly to highly weathered granite cobbles of medium strength							855.0
4	- gravelly, < 75 mm, subangular							854.0
5								853.0
6	- gravel < 50 mm, angular							852.0
7								851.0
8	- 80 mm cobble							850.0
9								849.0
10								848.0
11	- dark brown							847.0
12								846.0
13	- trace gravel, coarse grained sand							845.0
14	- gravel < 60 mm, subangular							844.0
15	- gravel < 30 mm, subangular							844.0



**EBA Engineering Consultants Ltd.**

LOGGED BY: RM & MD

REVIEWED BY: JPB

DRAWING NO:

COMPLETION DEPTH: 23.8m

COMPLETE: 2/6/2010

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Winter 2010 Instrumentation Program		Minto Explorations Ltd.		BOREHOLE NO: 10-MDI-1					
Main Waste Dump		Driftwood 3000 Diamond Drill-HQ Core		PROJECT NO: W14101068.008					
Minto Mine, YT		6944923.137N; 384117.207E; Zone 8		ELEVATION: 858.6001m					
SAMPLE TYPE		<input type="checkbox"/> GRAB SAMPLE	<input type="checkbox"/> NO RECOVERY	<input type="checkbox"/> BULK	<input type="checkbox"/> CRREL CORE	<input type="checkbox"/> SHELBY TUBE	<input type="checkbox"/> GRAB CORE		
BACKFILL TYPE		<input type="checkbox"/> BENTONITE	<input type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input type="checkbox"/> SAND		
Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density(kg/m <sup>3</sup> )		CLAY (%)		Slope Indicator	Elevation (m)
				20 40 60 80	20 40 60 80	20 40 60 80	20 40 60 80		
				PLASTIC M.C. LIQUID		SILT (%)			
				20 40 60 80		20 40 60 80			
						SAND (%)			
						20 40 60 80			
						GRAVEL (%)			
						20 40 60 80			
15									843.0
16	BEDROCK: granite, slightly weathered, slightly friable, oxide stained joints								842.0
17									841.0
18	- no longer friable								840.0
19									839.0
20	- friable								838.0
21									837.0
22									836.0
23									835.0
24	END OF BOREHOLE at 23.8 m - set HW casing 1.2 m below OG - installed inclinometer to 836.3 m - azimuth of A+ direction is 130°								834.0
25									833.0
26									832.0
27									831.0
28									830.0
29									829.0
30									829.0



**EBA Engineering Consultants Ltd.**

LOGGED BY: RM & MD	COMPLETION DEPTH: 23.8m
REVIEWED BY: JPB	COMPLETE: 2/6/2010
DRAWING NO:	Page 2 of 2

Winter 2010 Instrumentation Program		Minto Explorations Ltd.		BOREHOLE NO: 10-MDI-2						
Main Waste Dump		Driftwood 3000 Diamond Drill-HQ Core		PROJECT NO: W14101068.008						
Minto Mine, YT		6945013.0801N; 384217.204E; Zone 8		ELEVATION: 858.3001m						
SAMPLE TYPE		<input checked="" type="checkbox"/> GRAB SAMPLE	<input type="checkbox"/> NO RECOVERY	<input checked="" type="checkbox"/> BULK	<input type="checkbox"/> CRREL CORE	<input type="checkbox"/> SHELBY TUBE	<input checked="" type="checkbox"/> GRAB CORE			
BACKFILL TYPE		<input checked="" type="checkbox"/> BENTONITE	<input type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input type="checkbox"/> SAND			
Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density(kg/m <sup>3</sup> )		PLASTIC M.C. LIQUID		Slope Indicator	Elevation (m)
					20	40	60	80		
0	WASTE ROCK FILL									858.0
1										857.0
2										856.0
3										855.0
4										854.0
5										853.0
6										852.0
7										851.0
8										850.0
9	SAND AND GRAVEL FILL									849.0
10										848.0
11	PEAT: fine fibrous, graded to amorphous granular, brown to black SAND: silty, trace gravel, poorly graded, fine grained sand, gravel < 10 mm angular to subangular, brown									847.0
12	- some gravel, < 20 mm subrounded to subangular									846.0
13		<input checked="" type="checkbox"/>	G1							845.0
14	- trace silt, well graded, fine to medium grained sand, gravel < 10 mm angular and subangular	<input checked="" type="checkbox"/>	G2							844.0
15	- gravel < 30 mm subangular									844.0



**EBA Engineering Consultants Ltd.**

LOGGED BY: RM, MD & JD	COMPLETION DEPTH: 51.6m
REVIEWED BY: JPB	COMPLETE: 2/5/2010
DRAWING NO:	Page 1 of 4

Winter 2010 Instrumentation Program		Minto Explorations Ltd.		BOREHOLE NO: 10-MDI-2						
Main Waste Dump		Driftwood 3000 Diamond Drill-HQ Core		PROJECT NO: W14101068.008						
Minto Mine, YT		6945013.0801N; 384217.204E; Zone 8		ELEVATION: 858.3001m						
SAMPLE TYPE		<input checked="" type="checkbox"/> GRAB SAMPLE	<input type="checkbox"/> NO RECOVERY	<input checked="" type="checkbox"/> BULK	<input type="checkbox"/> CRREL CORE	<input type="checkbox"/> SHELBY TUBE	<input checked="" type="checkbox"/> GRAB CORE			
BACKFILL TYPE		<input checked="" type="checkbox"/> BENTONITE	<input type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input type="checkbox"/> SAND			
Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density(kg/m <sup>3</sup> )		PLASTIC M.C. LIQUID		Slope Indicator	Elevation (m)
					20	40	60	80		
15										843.0
16										842.0
17										841.0
18	- gravel < 40 mm subangular									840.0
19	- 100 mm cobble									839.0
20	SAND (TILL): silty, some gravel, poorly graded sand, fine grained gravel < 20 mm subangular greyish brown									838.0
21		<input checked="" type="checkbox"/>	G3							837.0
22		<input checked="" type="checkbox"/>	G4	- Vs, abundant 5 mm thick ice lenses, clear						836.0
23										835.0
24		<input checked="" type="checkbox"/>	G5	- Nbn - Vs, abundant 1-4 mm thick ice lenses, clear						834.0
25		<input checked="" type="checkbox"/>	G6							833.0
26		<input checked="" type="checkbox"/>	G7	- 20 mm thick ice lens, cloudy						832.0
27	- 300 mm boulder									831.0
28		<input checked="" type="checkbox"/>	G8							830.0
29	- gravelly, < 40 mm subangular - sand and gravel, trace silt, coarse grained sand									829.0
30										



**EBA Engineering Consultants Ltd.**

LOGGED BY: RM, MD & JD	COMPLETION DEPTH: 51.6m
REVIEWED BY: JPB	COMPLETE: 2/5/2010
DRAWING NO:	Page 2 of 4

Winter 2010 Instrumentation Program		Minto Explorations Ltd.		BOREHOLE NO: 10-MDI-2						
Main Waste Dump		Driftwood 3000 Diamond Drill-HQ Core		PROJECT NO: W14101068.008						
Minto Mine, YT		6945013.0801N; 384217.204E; Zone 8		ELEVATION: 858.3001m						
SAMPLE TYPE		<input checked="" type="checkbox"/> GRAB SAMPLE	<input type="checkbox"/> NO RECOVERY	<input checked="" type="checkbox"/> BULK	<input type="checkbox"/> CRREL CORE	<input type="checkbox"/> SHELBY TUBE	<input checked="" type="checkbox"/> GRAB CORE			
BACKFILL TYPE		<input checked="" type="checkbox"/> BENTONITE	<input type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input type="checkbox"/> SAND			
Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density(kg/m <sup>3</sup> )		PLASTIC M.C. LIQUID		Slope Indicator	Elevation (m)
					20 40 60 80	20 40 60 80	20 40 60 80	20 40 60 80		
30	- trace silt - frequent cobbles, 100-150 mm									828.0
31										827.0
32	SILT (TILL): sandy, trace clay, trace gravel, gravel < 20 mm subangular, firm, low to non plastic, dark greyish brown	<input checked="" type="checkbox"/>	G9							826.0
33		<input checked="" type="checkbox"/>	G10							
34	SAND: trace silt, poorly graded, medium grained, greyish brown - becomes gravelly, < 15 mm subangular	<input checked="" type="checkbox"/>	G11							825.0
35	SAND (TILL): silty, gravelly, fine grained sand, gravel < 40 mm subangular, greyish brown									824.0
36										823.0
37										822.0
38	- some silt, trace gravel, trace clay, angular sand, fine grained gravel, occasional cobbles < 80 mm									821.0
39	SILT (TILL): some sand, trace gravel, trace clay, gravel < 20 mm, low to non plastic, grey	<input checked="" type="checkbox"/>	G12							820.0
40	SAND (RESIDUUM): trace gravel, trace silt, well graded, fine grained sand, brown, oxidized									819.0
41	BEDROCK: fine to coarse particles, sharp, extremely weak, oxide staining to grey, intermitent indicators of silt infill at former joints									818.0
42	- granite, residual, very weak moderately weathered, very closely spaced discontinuities, fair quality, oxide stained joints									817.0
43										816.0
44										815.0
45										814.0



**EBA Engineering Consultants Ltd.**

LOGGED BY: RM, MD & JD	COMPLETION DEPTH: 51.6m
REVIEWED BY: JPB	COMPLETE: 2/5/2010
DRAWING NO:	Page 3 of 4

Winter 2010 Instrumentation Program		Minto Explorations Ltd.		BOREHOLE NO: 10-MDI-2				
Main Waste Dump		Driftwood 3000 Diamond Drill-HQ Core		PROJECT NO: W14101068.008				
Minto Mine, YT		6945013.0801N; 384217.204E; Zone 8		ELEVATION: 858.3001m				
SAMPLE TYPE		<input type="checkbox"/> GRAB SAMPLE	<input type="checkbox"/> NO RECOVERY	<input checked="" type="checkbox"/> BULK	<input type="checkbox"/> CRREL CORE	<input type="checkbox"/> SHELBY TUBE	<input type="checkbox"/> GRAB CORE	
BACKFILL TYPE		<input type="checkbox"/> BENTONITE	<input type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input type="checkbox"/> SAND	
Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density(kg/m <sup>3</sup> )		Slope Indicator	Elevation (m)
					20 40 60 80	20 40 60 80		
					PLASTIC M.C.	LIQUID		
					20 40 60 80	20 40 60 80		
45								813.0
46								812.0
47	- medium grained							811.0
48								810.0
49								809.0
50								808.0
51								807.0
52	END OF BOREHOLE at 51.6 m - set HW casing 1.4 m below OG - installed inclinometer to 806.9 m - azimuth of A+ is 93°							806.0
53								805.0
54								804.0
55								803.0
56								802.0
57								801.0
58								800.0
59								799.0
60								



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REVIEWED BY: JPB

DRAWING NO:

COMPLETION DEPTH: 51.6m

COMPLETE: 2/5/2010

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Winter 2010 Instrumentation Program		Minto Explorations Ltd.		BOREHOLE NO: 10-MDI-2								
Main Waste Dump		Driftwood 3000 Diamond Drill-HQ Core		PROJECT NO: W14101068.008								
Minto Mine, YT		6945013.0801N; 384217.204E; Zone 8		ELEVATION: 858.3001m								
SAMPLE TYPE		<input checked="" type="checkbox"/> GRAB SAMPLE	<input type="checkbox"/> NO RECOVERY	<input checked="" type="checkbox"/> BULK	<input type="checkbox"/> CRREL CORE	<input type="checkbox"/> SHELBY TUBE	<input type="checkbox"/> GRAB CORE					
BACKFILL TYPE		<input type="checkbox"/> BENTONITE	<input type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input type="checkbox"/> SAND					
Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density(kg/m <sup>3</sup> )		PLASTIC M.C.		LIQUID		Slope Indicator	Elevation (m)
					20	40	60	80	20	40		
0	WASTE ROCK FILL											858.0
1												857.0
2												856.0
3												855.0
4												854.0
5												853.0
6												852.0
7												851.0
8												850.0
9	SAND AND GRAVEL FILL											849.0
10												848.0
11	PEAT: fine fibrous, graded to amorphous granular, brown to black SAND: silty, trace gravel, poorly graded, fine grained sand, gravel < 10 mm angular to subangular, brown											847.0
12	- some gravel, < 20 mm subrounded to subangular											846.0
13		<input checked="" type="checkbox"/>	G1									845.0
14	- trace silt, well graded, fine to medium grained sand, gravel < 10 mm angular and subangular	<input checked="" type="checkbox"/>	G2									844.0
15	- gravel < 30 mm subangular											844.0



**EBA Engineering Consultants Ltd.**

LOGGED BY: RM, MD & JD	COMPLETION DEPTH: 51.6m
REVIEWED BY: JPB	COMPLETE: 2/5/2010
DRAWING NO:	Page 1 of 4



Winter 2010 Instrumentation Program		Minto Explorations Ltd.		BOREHOLE NO: 10-MDI-2				
Main Waste Dump		Driftwood 3000 Diamond Drill-HQ Core		PROJECT NO: W14101068.008				
Minto Mine, YT		6945013.0801N; 384217.204E; Zone 8		ELEVATION: 858.3001m				
SAMPLE TYPE		<input checked="" type="checkbox"/> GRAB SAMPLE	<input type="checkbox"/> NO RECOVERY	<input checked="" type="checkbox"/> BULK	<input type="checkbox"/> CRREL CORE	<input type="checkbox"/> SHELBY TUBE	<input checked="" type="checkbox"/> GRAB CORE	
BACKFILL TYPE		<input checked="" type="checkbox"/> BENTONITE	<input type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input type="checkbox"/> SAND	
Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density(kg/m <sup>3</sup> )		Slope Indicator	Elevation (m)
					PLASTIC M.C.	LIQUID		
					20 40 60 80	20 40 60 80		
15								843.0
16								842.0
17								841.0
18	- gravel < 40 mm subangular							840.0
19	- 100 mm cobble							839.0
20	SAND (TILL): silty, some gravel, poorly graded sand, fine grained gravel < 20 mm subangular greyish brown							838.0
21		<input checked="" type="checkbox"/>	G3					837.0
22		<input checked="" type="checkbox"/>	G4	- Vs, abundant 5 mm thick ice lenses, clear				836.0
23								835.0
24		<input checked="" type="checkbox"/>	G5	- Nbn - Vs, abundant 1-4 mm thick ice lenses, clear				834.0
25		<input checked="" type="checkbox"/>	G6					833.0
26		<input checked="" type="checkbox"/>	G7	- 20 mm thick ice lens, cloudy				832.0
27	- 300 mm boulder							831.0
28		<input checked="" type="checkbox"/>	G8					830.0
29	- gravelly, < 40 mm subangular - sand and gravel, trace silt, coarse grained sand							829.0
30								



**EBA Engineering Consultants Ltd.**

LOGGED BY: RM, MD & JD	COMPLETION DEPTH: 51.6m
REVIEWED BY: JPB	COMPLETE: 2/5/2010
DRAWING NO:	Page 2 of 4

Winter 2010 Instrumentation Program		Minto Explorations Ltd.		BOREHOLE NO: 10-MDI-2								
Main Waste Dump		Driftwood 3000 Diamond Drill-HQ Core		PROJECT NO: W14101068.008								
Minto Mine, YT		6945013.0801N; 384217.204E; Zone 8		ELEVATION: 858.3001m								
SAMPLE TYPE		<input checked="" type="checkbox"/> GRAB SAMPLE	<input type="checkbox"/> NO RECOVERY	<input checked="" type="checkbox"/> BULK	<input type="checkbox"/> CRREL CORE	<input type="checkbox"/> SHELBY TUBE	<input checked="" type="checkbox"/> GRAB CORE					
BACKFILL TYPE		<input checked="" type="checkbox"/> BENTONITE	<input type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input type="checkbox"/> SAND					
Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density(kg/m <sup>3</sup> )		PLASTIC M.C.		LIQUID		Slope Indicator	Elevation (m)
					20	40	60	80	20	40		
30	- trace silt - frequent cobbles, 100-150 mm											828.0
31												827.0
32	SILT (TILL): sandy, trace clay, trace gravel, gravel < 20 mm subangular, firm, low to non plastic, dark greyish brown	<input checked="" type="checkbox"/>	G9									826.0
33		<input checked="" type="checkbox"/>	G10									825.0
34	SAND: trace silt, poorly graded, medium grained, greyish brown - becomes gravelly, < 15 mm subangular											824.0
35	SAND (TILL): silty, gravelly, fine grained sand, gravel < 40 mm subangular, greyish brown											823.0
36												822.0
37												821.0
38	- some silt, trace gravel, trace clay, angular sand, fine grained gravel, occasional cobbles < 80 mm											820.0
39	SILT (TILL): some sand, trace gravel, trace clay, gravel < 20 mm, low to non plastic, grey											819.0
40	SAND (RESIDUUM): trace gravel, trace silt, well graded, fine grained sand, brown, oxidized											818.0
41	BEDROCK: fine to coarse particles, sharp, extremely weak, oxide staining to grey, intermitent indicators of silt infill at former joints											817.0
42	- granite, residual, very weak moderately weathered, very closely spaced discontinuities, fair quality, oxide stained joints											816.0
43												815.0
44												814.0
45												



**EBA Engineering Consultants Ltd.**

LOGGED BY: RM, MD & JD	COMPLETION DEPTH: 51.6m
REVIEWED BY: JPB	COMPLETE: 2/5/2010
DRAWING NO:	Page 3 of 4

Winter 2010 Instrumentation Program		Minto Explorations Ltd.		BOREHOLE NO: 10-MDI-2				
Main Waste Dump		Driftwood 3000 Diamond Drill-HQ Core		PROJECT NO: W14101068.008				
Minto Mine, YT		6945013.0801N; 384217.204E; Zone 8		ELEVATION: 858.3001m				
SAMPLE TYPE		<input type="checkbox"/> GRAB SAMPLE	<input type="checkbox"/> NO RECOVERY	<input checked="" type="checkbox"/> BULK	<input type="checkbox"/> CRREL CORE	<input type="checkbox"/> SHELBY TUBE	<input type="checkbox"/> GRAB CORE	
BACKFILL TYPE		<input type="checkbox"/> BENTONITE	<input type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input type="checkbox"/> SAND	
Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density(kg/m <sup>3</sup> )		Slope Indicator	Elevation (m)
					20 40 60 80	20 40 60 80		
					PLASTIC M.C.	LIQUID		
					20 40 60 80	20 40 60 80		
45								813.0
46								812.0
47	- medium grained							811.0
48								810.0
49								809.0
50								808.0
51								807.0
52	END OF BOREHOLE at 51.6 m - set HW casing 1.4 m below OG - installed inclinometer to 806.9 m - azimuth of A+ is 93°							806.0
53								805.0
54								804.0
55								803.0
56								802.0
57								801.0
58								800.0
59								799.0
60								



**EBA Engineering Consultants Ltd.**

LOGGED BY: RM, MD & JD

REVIEWED BY: JPB

DRAWING NO:

COMPLETION DEPTH: 51.6m

COMPLETE: 2/5/2010

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Winter 2010 Instrumentation Program		CLIENT: Minto Explorations Ltd.		BOREHOLE NO: 10-SWFI-5											
Area 1 Open Pit		DRILL: Driftwood 3000 Diamond Drill-HQ Core		PROJECT NO: W14101068.012											
Minto Mine, YT		6944695.774N; 384376.689E; Zone 8		ELEVATION: 835.299m											
SAMPLE TYPE		<input type="checkbox"/> GRAB SAMPLE	<input type="checkbox"/> NO RECOVERY	<input checked="" type="checkbox"/> BULK	<input type="checkbox"/> CRREL CORE	<input type="checkbox"/> SHELBY TUBE	<input type="checkbox"/> GRAB CORE								
BACKFILL TYPE		<input type="checkbox"/> BENTONITE	<input type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input type="checkbox"/> SAND								
Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density(kg/m <sup>3</sup> )		CLAY (%)		SILT (%)		SAND (%)		GRAVEL (%)	Slope Indicator	Elevation (m)
					20	40	60	80	20	40	60	80			
0	WASTE ROCK FILL														835.0
1															834.0
2															833.0
3															832.0
4															831.0
5	PEAT: amorphous granular, some fine fibres, trace wood peices, dark brown			- Nbe - Nbn											830.0
6	SILT: some sand, trace clay, thinly laminated, fine grained sand, dark brown														829.0
7	SAND (TILL): silty, some gravel, medium grained sand, gravel < 50 mm, angular to subangular, brown														828.0
8	- gravel < 40 mm, greyish brown		G1	- Vs < 25%, 3-12 mm thick ice lenses - Vx < 10 %											827.0
9															826.0
10			G2	- Nbn - Vs < 15%, < 20 mm thick ice lensws - Vr < 10%, 4 mm thick ice lensws - Vc < 1%, 2 mm thick ice coatings - Vx, 2-5%, < 4-12 mm thick - Nbn											825.0
11	SILT (TILL): sandy, some gravel, gravel < 50 mm, low to non plastic, greyish brown														824.0
12	- gravel < 75 mm		G3												823.0
13			G4												822.0
14	SAND (TILL): gravelly, some silt, gravel < 20 mm, greyish brown														821.0
15	- trace cobbles < 250 mm		G5	- Nbn - Vx 10-20%, <20 mm thick											820.0



**EBA Engineering Consultants Ltd.**

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DRAWING NO:

COMPLETION DEPTH: 80.8m

COMPLETE: 2/8/2010

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Winter 2010 Instrumentation Program		CLIENT: Minto Explorations Ltd.		BOREHOLE NO: 10-SWFI-5											
Area 1 Open Pit		DRILL: Driftwood 3000 Diamond Drill-HQ Core		PROJECT NO: W14101068.012											
Minto Mine, YT		6944695.774N; 384376.689E; Zone 8		ELEVATION: 835.299m											
SAMPLE TYPE		<input type="checkbox"/> GRAB SAMPLE	<input type="checkbox"/> NO RECOVERY	<input checked="" type="checkbox"/> BULK	<input type="checkbox"/> CRREL CORE	<input type="checkbox"/> SHELBY TUBE	<input type="checkbox"/> GRAB CORE								
BACKFILL TYPE		<input type="checkbox"/> BENTONITE	<input type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input type="checkbox"/> SAND								
Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density(kg/m <sup>3</sup> )		CLAY (%)		SILT (%)		SAND (%)		GRAVEL (%)	Slope Indicator	Elevation (m)
					20	40	60	80	20	40	60	80			
15				- 60 mm thick ice lens, clear to white											820.0
16	- gravel < 50 mm		G6	- Vx < 2%, < 25 mm thick											819.0
17			G7	- Vx, 15 mm thick vertical lens											818.0
18	- gravel < 30 mm		G8	- 70 mm thick ice lens, clear to white											817.0
19	- medium grained sand, cobbles < 120 mm			- 50 mm thick ice lens, clear, white inclusions											816.0
20				- Nbn											815.0
21	- boulder, granite - gravel < 40 mm		G9	- Vx, 10-20%											814.0
22															813.0
23			G10												812.0
24	SILT (TILL): gravelly, some silt, some clay, gravel < 20 mm greyish brown - sandy, some gravel < 10 mm, medium grained sand - 100 mm cobble		G11	- Vx, Vc, 15-20%, < 10 mm thick											811.0
25															810.0
26			G12	- Vx/Vr, 10-15%, < 20 mm thick - 300 mm thick ice lens											809.0
27	- some sand, trace gravel, trace clay, low to non plastic, gravel < 75 mm subangular														808.0
28	- 480 mm boulder, granite		G13												807.0
29				- Nbn											806.0
30			G14	- Vx < 12 mm thick											



**EBA Engineering Consultants Ltd.**

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DRAWING NO:

COMPLETION DEPTH: 80.8m

COMPLETE: 2/8/2010

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Winter 2010 Instrumentation Program		CLIENT: Minto Explorations Ltd.		BOREHOLE NO: 10-SWFI-5								
Area 1 Open Pit		DRILL: Driftwood 3000 Diamond Drill-HQ Core		PROJECT NO: W14101068.012								
Minto Mine, YT		6944695.774N; 384376.689E; Zone 8		ELEVATION: 835.299m								
<b>SAMPLE TYPE</b> <input checked="" type="checkbox"/> GRAB SAMPLE <input type="checkbox"/> NO RECOVERY <input checked="" type="checkbox"/> BULK <input type="checkbox"/> CRREL CORE <input type="checkbox"/> SHELBY TUBE <input type="checkbox"/> GRAB CORE												
<b>BACKFILL TYPE</b> <input checked="" type="checkbox"/> BENTONITE <input type="checkbox"/> PEA GRAVEL <input type="checkbox"/> SLOUGH <input type="checkbox"/> GROUT <input type="checkbox"/> DRILL CUTTINGS <input type="checkbox"/> SAND												
Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density (kg/m <sup>3</sup> )		PLASTIC M.C.		LIQUID		Slope Indicator	Elevation (m)
					20	40	60	80	20	40		
30												805.0
31												804.0
32												803.0
33	- and clay, some gravel, low plastic		G15									802.0
34	CLAY (TILL): silt, trace fine grained sand, occasional brown laminations, very stiff, medium to high plastic, dark grey		G16									801.0
35	- 300 mm boulder - no recovery											800.0
36	SAND (TILL): silty, trace clay, poorly graded fine grained sand, greyish brown, occasional brown laminations < 2 mm											799.0
37			G17									798.0
38	- brown and grey laminations < 3 mm				- Vr < 5%, < 1 mm thick lenses - Nbn							797.0
39	- slight organic odour detected		G18									796.0
40	SAND (TILL): silty, some gravel, trace sand, gravel < 60 mm subangular, medium plastic, dark grey, occasional fine grained sand pockets < 2 mm											795.0
41	- gravel < 25 mm subangular		G19									794.0
42	CLAY (TILL): silty, some gravel, trace sand, gravel < 60 mm subangular, medium plastic, dark grey, occasional fine grained sand pockets < 2 mm		G20									793.0
43	- some sand, medium to high plastic, occasional brown silt pockets		G21									792.0
44	- gravel < 20 mm angular to subangular, high plastic											791.0
45	- 100 mm cobble		G22									



**EBA Engineering Consultants Ltd.**

LOGGED BY: RM, MD & JD	COMPLETION DEPTH: 80.8m
REVIEWED BY: JPB	COMPLETE: 2/8/2010
DRAWING NO:	Page 3 of 6

Winter 2010 Instrumentation Program		CLIENT: Minto Explorations Ltd.		BOREHOLE NO: 10-SWFI-5											
Area 1 Open Pit		DRILL: Driftwood 3000 Diamond Drill-HQ Core		PROJECT NO: W14101068.012											
Minto Mine, YT		6944695.774N; 384376.689E; Zone 8		ELEVATION: 835.299m											
SAMPLE TYPE		<input checked="" type="checkbox"/> GRAB SAMPLE	<input type="checkbox"/> NO RECOVERY	<input checked="" type="checkbox"/> BULK	<input type="checkbox"/> CRREL CORE	<input type="checkbox"/> SHELBY TUBE	<input checked="" type="checkbox"/> GRAB CORE								
BACKFILL TYPE		<input checked="" type="checkbox"/> BENTONITE	<input checked="" type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input checked="" type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input checked="" type="checkbox"/> SAND								
Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density(kg/m <sup>3</sup> )		CLAY (%)		SILT (%)		SAND (%)		GRAVEL (%)	Slope Indicator	Elevation (m)
					20	40	60	80	20	40	60	80			
45	CLAY: silty, trace to no gravel, fine grained gravel, slickensided, high plastic, dark grey														790.0
46	CLAY (TILL): some silt, some gravel, trace sand, gravel < 40 mm angular to subangular, high plastic, dark grey														789.0
47	SAND: gravelly, trace silt, medium to coarse grained sand, gravel < 75 mm angular to subangular, brown														788.0
48	- poor recovery, sample dropping out of inner tube														787.0
49	- granite pieces, rough, highly weathered, weak, medium grained, oxide stained joints, very poor quality, grey														786.0
50	- granite pieces, weak to very weak, moderate to slightly weathered, trace residual														785.0
51															784.0
52															783.0
53															782.0
54	- trace fine grained gravel, uniformly graded, medium grained sand, brown grey, occasional coarse gravel to cobble < 100 mm														781.0
55															780.0
56															779.0
57	- no recovery														778.0
58															777.0
59															776.0
60															



**EBA Engineering Consultants Ltd.**

LOGGED BY: RM, MD & JD	COMPLETION DEPTH: 80.8m
REVIEWED BY: JPB	COMPLETE: 2/8/2010
DRAWING NO:	Page 4 of 6



Winter 2010 Instrumentation Program		CLIENT: Minto Explorations Ltd.		BOREHOLE NO: 10-SWFI-5				
Area 1 Open Pit		DRILL: Driftwood 3000 Diamond Drill-HQ Core		PROJECT NO: W14101068.012				
Minto Mine, YT		6944695.774N; 384376.689E; Zone 8		ELEVATION: 835.299m				
SAMPLE TYPE		<input checked="" type="checkbox"/> GRAB SAMPLE	<input type="checkbox"/> NO RECOVERY	<input checked="" type="checkbox"/> BULK	<input type="checkbox"/> CRREL CORE	<input type="checkbox"/> SHELBY TUBE	<input checked="" type="checkbox"/> GRAB CORE	
BACKFILL TYPE		<input type="checkbox"/> BENTONITE	<input checked="" type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input checked="" type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input checked="" type="checkbox"/> SAND	
Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density(kg/m <sup>3</sup> )		Slope Indicator	Elevation (m)
					20 40 60 80	20 40 60 80		
					PLASTIC M.C.	LIQUID		
					20 40 60 80	20 40 60 80		
60								775.0
61	- no recovery							774.0
62								773.0
63								772.0
64								771.0
65								770.0
66								769.0
67								768.0
68								767.0
69								766.0
70								765.0
71								764.0
72								763.0
73								762.0
74								761.0
75								



**EBA Engineering Consultants Ltd.**

LOGGED BY: RM, MD & JD	COMPLETION DEPTH: 80.8m
REVIEWED BY: JPB	COMPLETE: 2/8/2010
DRAWING NO:	Page 5 of 6

Winter 2010 Instrumentation Program		CLIENT: Minto Explorations Ltd.		BOREHOLE NO: 10-SWFI-5						
Area 1 Open Pit		DRILL: Driftwood 3000 Diamond Drill-HQ Core		PROJECT NO: W14101068.012						
Minto Mine, YT		6944695.774N; 384376.689E; Zone 8		ELEVATION: 835.299m						
SAMPLE TYPE		<input type="checkbox"/> GRAB SAMPLE	<input type="checkbox"/> NO RECOVERY	<input checked="" type="checkbox"/> BULK	<input type="checkbox"/> CRREL CORE	<input type="checkbox"/> SHELBY TUBE	<input type="checkbox"/> GRAB CORE			
BACKFILL TYPE		<input type="checkbox"/> BENTONITE	<input type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input type="checkbox"/> SAND			
Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density(kg/m <sup>3</sup> )		PLASTIC M.C. LIQUID		Slope Indicator	Elevation (m)
					20	40	60	80		
75										760.0
76										759.0
77	gravel < 70 mm subangular and angular									758.0
78	BEDROCK: granite, poor quality, weathered, oxide stained joints, light and dark grey									757.0
79										756.0
80										755.0
81	END OF BOREHOLE at 80.8 - set HW casing 1.2 m below OG - installed inclinometer to 755.3 m - azimuth of A+ direction is 44°									754.0
82										753.0
83										752.0
84										751.0
85										750.0
86										749.0
87										748.0
88										747.0
89										746.0
90										



**EBA Engineering Consultants Ltd.**

LOGGED BY: RM, MD & JD	COMPLETION DEPTH: 80.8m
REVIEWED BY: JPB	COMPLETE: 2/8/2010
DRAWING NO:	Page 6 of 6

Winter 2010 Instrumentation Program		CLIENT: Minto Explorations Ltd.		BOREHOLE NO: 10-SWFI-6														
Area 1 Open Pit		DRILL: Driftwood 3000 Diamond Drill-HQ Core		PROJECT NO: W14101068.012														
Minto Mine, YT		6944567.726N; 384384.236E; Zone 8		ELEVATION: 845.616m														
SAMPLE TYPE		<input checked="" type="checkbox"/> GRAB SAMPLE	<input type="checkbox"/> NO RECOVERY	<input checked="" type="checkbox"/> BULK	<input type="checkbox"/> CRREL CORE	<input type="checkbox"/> SHELBY TUBE	<input checked="" type="checkbox"/> GRAB CORE											
BACKFILL TYPE		<input checked="" type="checkbox"/> BENTONITE	<input checked="" type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input checked="" type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input checked="" type="checkbox"/> SAND											
Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density(kg/m <sup>3</sup> )		PLASTIC M.C.		LIQUID	CLAY (%)		SILT (%)		SAND (%)		GRAVEL (%)	Slope Indicator	Elevation (m)
					20	40	60	80		20	40	60	80	20	40			
0	CLAY: silty, some sand, low plastic, occasional roots			- seasonal frost														845.0
1																		844.0
2	SILT: sandy, low plastic, brown																	843.0
3	SILT (TILL): sandy, trace clay, trace fine gravel, medium grained sand, brown			- Nbn														842.0
4	- clay lens, silty, laminated, low plastic, greyish brown																	841.0
5	CLAY (TILL): sandy, silty, trace gravel, gravel < 20 mm, low plastic, dark grey, oxide stains			- Nbn														840.0
6	- brown			- Vx < 5%														839.0
7	SILT (TILL): snady, trace fine gravel, low to non plastic, dark grey, oxide stained																	838.0
8	- gravelly																	837.0
9	- no oxide staining visible																	836.0
10	- gravel < 20 mm		G1	- Vx < 20%, < 12 mm thick														835.0
11	- clay pockets, high plastic		G2	- Nbn														834.0
12	CLAY (TILL): silty, some sand, trace gravel, gravel < 20 mm, dark grey to black		G3	- 100 mm thick ice lens, clear, laminar														833.0
13	- clay lens, high plastic, dark grey		G4	- < 40 mm thick ice lens, clear														832.0
14	- medium plastic, gravel < 40 mm, dark grey		G5	- Nbn														831.0
15	SILT (TILL): sandy, trace clay, trace gravel, fine grained gravel < 15 mm, low to non plastic, dark grey		G6															
	SAND (TILL): silty, some gravel, medium grained gravel < 25 mm, dark grey																	



**EBA Engineering Consultants Ltd.**

LOGGED BY: RM & MD	COMPLETION DEPTH: 24.1m
REVIEWED BY: JPB	COMPLETE: 2/9/2010
DRAWING NO:	Page 1 of 2

Winter 2010 Instrumentation Program		CLIENT: Minto Explorations Ltd.		BOREHOLE NO: 10-SWFI-6								
Area 1 Open Pit		DRILL: Driftwood 3000 Diamond Drill-HQ Core		PROJECT NO: W14101068.012								
Minto Mine, YT		6944567.726N; 384384.236E; Zone 8		ELEVATION: 845.616m								
SAMPLE TYPE		<input checked="" type="checkbox"/> GRAB SAMPLE	<input type="checkbox"/> NO RECOVERY	<input checked="" type="checkbox"/> BULK	<input type="checkbox"/> CRREL CORE	<input type="checkbox"/> SHELBY TUBE	<input checked="" type="checkbox"/> GRAB CORE					
BACKFILL TYPE		<input checked="" type="checkbox"/> BENTONITE	<input type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input type="checkbox"/> SAND					
Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density(kg/m <sup>3</sup> )		PLASTIC M.C.		LIQUID		Slope Indicator	Elevation (m)
					20	40	60	80	20	40		
15	SAND: trace silt, uniformly graded, fine grained, dark brown to grey			- Vx < 15%								830.0
16		<input checked="" type="checkbox"/>	G7									829.0
17	- coarse gravel lens, sandy, trace silt, well graded gravel < 40 mm - sand lens, trace fine gravel, well graded, coarse grained	<input checked="" type="checkbox"/>	G8									828.0
18	- sand lens, well graded, medium grained sand, dark brown	<input checked="" type="checkbox"/>	G9									827.0
19	SAND: some gravel, trace silt, well graded sand, coarse grained gravel < 12 mm, dark brown grey - gravelly, gravel < 20 mm, subangular to subrounded, brown, orange staining	<input checked="" type="checkbox"/>	G10	- Nbn - 6 mm thick ice lens, clear								826.0
20												825.0
21	BEDROCK: poor quality, weathered, weak, oxide stained joints, light and dark brown											824.0
22	- pink quartz and mica inclusions											823.0
23												822.0
24	END OF BOREHOLE at 24.1 m - installed inclinometer to 822.7m - azimuth of A+ direction is 6°											821.0
25												820.0
26												819.0
27												818.0
28												817.0
29												816.0
30												816.0



**EBA Engineering Consultants Ltd.**

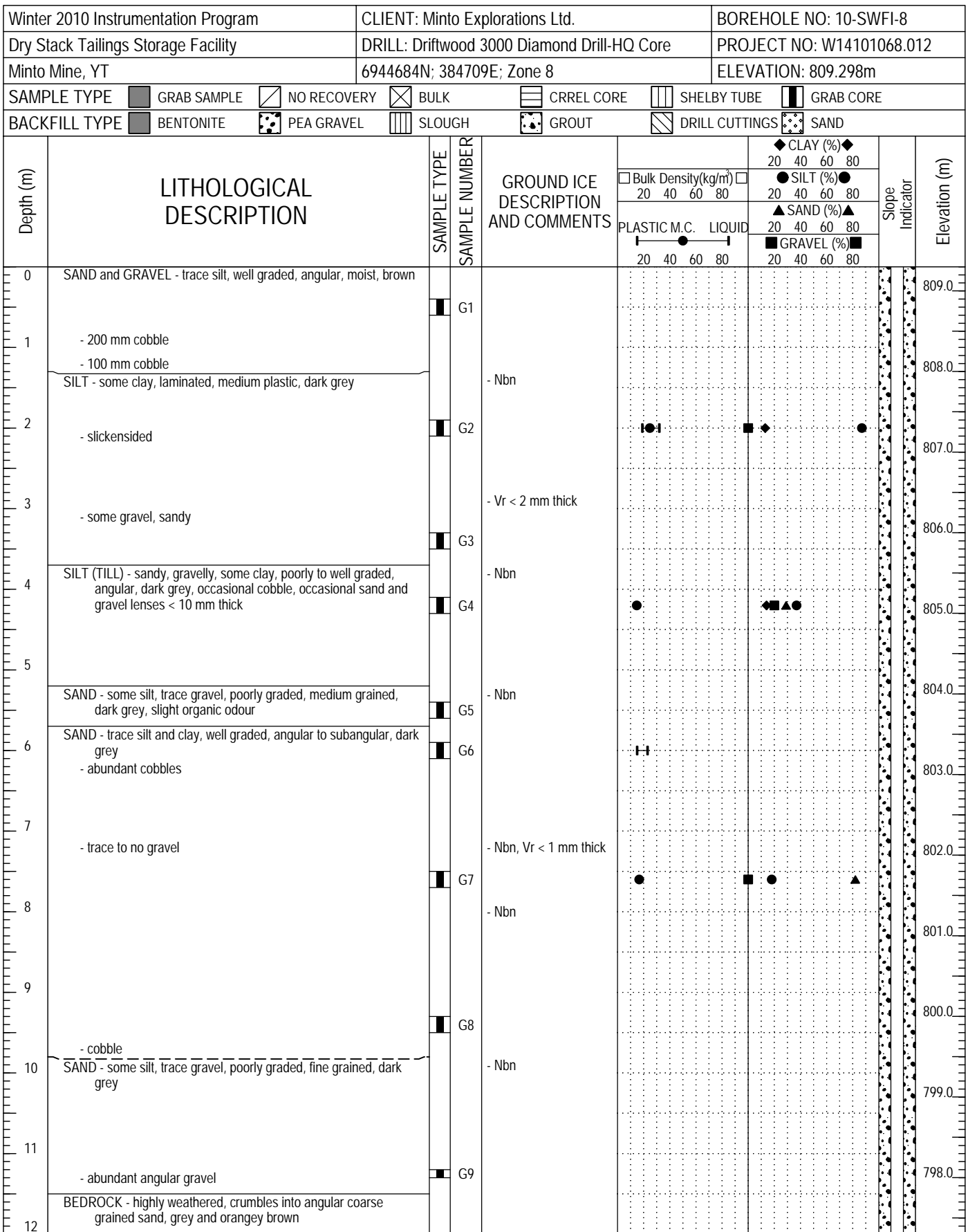
LOGGED BY: RM & MD	COMPLETION DEPTH: 24.1m
REVIEWED BY: JPB	COMPLETE: 2/9/2010
DRAWING NO:	Page 2 of 2

Winter 2010 Instrumentation Program		CLIENT: Minto Explorations Ltd.		BOREHOLE NO: 10-SWFI-7								
Area 1 Open Pit		DRILL: Driftwood 3000 Diamond Drill-HQ Core		PROJECT NO: W14101068.012								
Minto Mine, YT		6944515.201N; 384665.486E; Zone 8		ELEVATION: 864.732m								
SAMPLE TYPE		<input checked="" type="checkbox"/> GRAB SAMPLE	<input type="checkbox"/> NO RECOVERY	<input checked="" type="checkbox"/> BULK	<input type="checkbox"/> CRREL CORE	<input type="checkbox"/> SHELBY TUBE	<input checked="" type="checkbox"/> GRAB CORE					
BACKFILL TYPE		<input checked="" type="checkbox"/> BENTONITE	<input checked="" type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input checked="" type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input checked="" type="checkbox"/> SAND					
Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density(kg/m <sup>3</sup> )		PLASTIC M.C.		LIQUID		Slope Indicator	Elevation (m)
					20	40	60	80	20	40		
0	SILT: clayey, some fine sand, low to non plastic, brown			- seasonal frost								864.0
1												863.0
2	- cobble											862.0
3												861.0
4	CLAY (TILL): silty, some sand, trace gravel, gravel < 30 mm, low plastic, brown			- Nbn								860.0
5												859.0
6	- occasional cobble < 100 mm			- Nbe								858.0
7												857.0
8				- Vx, 1-5%, < 10 mm thick								856.0
9			G1	- Nbn								855.0
10	- some gravel < 50 mm, cobbles < 120 mm											854.0
11			G2									853.0
12	- no more cobbles		G3									852.0
13	SAND (TILL): sandy, gravelly, some silt, gravel angular to subangular											851.0
14	BEDROCK: granite, slightly weathered, medium strong, fair quality, very close spaced discontinuities, silt infill											850.0
15	- poor quality, clay till and sand till infill up to 70 mm thick											849.0
16	- fair quality, stained joints, some residual infill < 30 mm thick											848.0
17	- faintly weathered trace sand infill < 2 mm thick											847.0
18	END OF BOREHOLE at 17.7 m											846.0
19	- installed inclinometer to 847.4 m											845.0
20	- azimuth of A+ direction is 93°											845.0



**EBA Engineering Consultants Ltd.**

LOGGED BY: RM	COMPLETION DEPTH: 17.7m
REVIEWED BY: JPB	COMPLETE: 2/9/2010
DRAWING NO:	Page 1 of 1



**EBA Engineering Consultants Ltd.**

LOGGED BY: MD & RR

REVIEWED BY: BC & JGD

DRAWING NO:

COMPLETION DEPTH: 20.4m

COMPLETE: 11/3/2010

Page 1 of 2

Winter 2010 Instrumentation Program		CLIENT: Minto Explorations Ltd.		BOREHOLE NO: 10-SWFI-8											
Dry Stack Tailings Storage Facility		DRILL: Driftwood 3000 Diamond Drill-HQ Core		PROJECT NO: W14101068.012											
Minto Mine, YT		6944684N; 384709E; Zone 8		ELEVATION: 809.298m											
SAMPLE TYPE		<input checked="" type="checkbox"/> GRAB SAMPLE	<input type="checkbox"/> NO RECOVERY	<input checked="" type="checkbox"/> BULK	<input type="checkbox"/> CRREL CORE	<input type="checkbox"/> SHELBY TUBE	<input checked="" type="checkbox"/> GRAB CORE								
BACKFILL TYPE		<input checked="" type="checkbox"/> BENTONITE	<input type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input type="checkbox"/> SAND								
Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density(kg/m <sup>3</sup> )		CLAY (%)		SILT (%)		SAND (%)		GRAVEL (%)	Slope Indicator	Elevation (m)
					20	40	60	80	20	40	60	80			
12			G10												797.0
13															796.0
14			G11												795.0
15	- rust stains, grey														794.0
16															793.0
17															792.0
18															791.0
19															790.0
20															789.0
21	END OF BOREHOLE at 20.4 m - installed inclinometer to 793.4 m - azimuth of A+ direction is 109°														788.0
22															787.0
23															786.0
24															



**EBA Engineering Consultants Ltd.**

LOGGED BY: MD & RR	COMPLETION DEPTH: 20.4m
REVIEWED BY: BC & JGD	COMPLETE: 11/3/2010
DRAWING NO:	Page 2 of 2

Winter 2010 Instrumentation Program		CLIENT: Minto Explorations Ltd.		BOREHOLE NO: 10-SWFI-9								
Dry Stack Tailings Storage Facility		DRILL: Driftwood 3000 Diamond Drill-HQ Core		PROJECT NO: W14101068.012								
Minto Mine, YT		6944775N; 384431.1E; Zone 8		ELEVATION: 810.703m								
SAMPLE TYPE		<input type="checkbox"/> GRAB SAMPLE	<input type="checkbox"/> NO RECOVERY	<input checked="" type="checkbox"/> BULK	<input type="checkbox"/> CRREL CORE	<input type="checkbox"/> SHELBY TUBE	<input type="checkbox"/> GRAB CORE					
BACKFILL TYPE		<input type="checkbox"/> BENTONITE	<input type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input type="checkbox"/> SAND					
Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density (kg/m <sup>3</sup> )		PLASTIC M.C.		LIQUID		Slope Indicator	Elevation (m)
					20	40	60	80	20	40		
0	BOULDER - granite, weathered											810.0
1												809.0
2												808.0
3	SILT (TILL) - sandy, clayey, trace gravel, poorly graded, fine grained, dark grey		G1	- Nbn - Ice, slightly cloudy, mainly clear								807.0
4												806.0
5			G2	- Ice lense, cloudy								805.0
6				- Ice lense, clear								804.0
7	- becomes more silty		G3	- Ice lense 40 mm, clear	●				■	▲	●	803.0
8				- Ice lense 30 mm, clear								802.0
9	SILT and SAND (TILL) - some gravel, some clay, low plastic, dark grey, occasional cobble		G4	- Ice lense 110 mm, clear								801.0
10			G5	- Vr < 5 mm thick, clear, vertical								800.0
11				- Nbn, occasional Vr < 1 mm thick	●							799.0
12			G6	- Ice lense 30 mm, clear	●				■	▲	●	798.0
13				- Vr < 5 mm thick, clear, vertical								797.0
14	- low-medium plastic, trace clay		G7	- Ice lense, clear								796.0
15			G8	- 30 mm ice lense, clear								795.0
16				- Ice and soil intermixed, < 40 mm thick lenses, clear								794.0
17	CLAY (TILL) - silty, trace sand, blocky, slickensided, medium plastic, dark grey, occasional gravel or cobble		G9	- Ice lense 50 mm, clear								793.0
18	- sandy, some gravel											792.0
19	- 120 mm cobble		G10	- Nbn	●	■	▲	●				791.0
20												790.0
21	SILT (TILL) - sandy, non-plastic, dark grey		G11	- Nbn								789.0
22	- sand, trace gravel											788.0
23	SAND (TILL) - silty, some gravel, poorly graded, angular, dark brown grey		G12	- Nbn								787.0
24	- frequent visible organic lense (brown organics)											786.0
25	- coarse grained sand		G13	- Nbn, Vr < 1 mm thick								
			G14									
			G15									
			G16									



**EBA Engineering Consultants Ltd.**

LOGGED BY: MD & RR

REVIEWED BY: BC & JGD

DRAWING NO:


COMPLETION DEPTH: 58.5m

COMPLETE: 11/4/2010

Page 1 of 3



Winter 2010 Instrumentation Program		CLIENT: Minto Explorations Ltd.		BOREHOLE NO: 10-SWFI-9								
Dry Stack Tailings Storage Facility		DRILL: Driftwood 3000 Diamond Drill-HQ Core		PROJECT NO: W14101068.012								
Minto Mine, YT		6944775N; 384431.1E; Zone 8		ELEVATION: 810.703m								
SAMPLE TYPE		<input checked="" type="checkbox"/> GRAB SAMPLE	<input type="checkbox"/> NO RECOVERY	<input checked="" type="checkbox"/> BULK	<input type="checkbox"/> CRREL CORE	<input type="checkbox"/> SHELBY TUBE	<input type="checkbox"/> GRAB CORE					
BACKFILL TYPE		<input type="checkbox"/> BENTONITE	<input type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input type="checkbox"/> SAND					
Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density(kg/m <sup>3</sup> )		PLASTIC M.C.		LIQUID		Slope Indicator	Elevation (m)
					20	40	60	80	20	40		
25	CLAY (TILL) - silty, trace sand, medium plastic, dark grey, occasional gravel	<input checked="" type="checkbox"/>	G17	- Nbn - Ice and soil intermixed - Ice lense 25 mm, clear								8785.0
26												
27	SILT (TILL) - sandy, some clay, non-plastic, dark grey, occasional cobble	<input checked="" type="checkbox"/>	G19	- Nbn								8783.0
28												
29	- trace sand	<input checked="" type="checkbox"/>	G21	- Nbn, occasional Vs < 20 mm lenses, clear								8781.0
30												
31		<input checked="" type="checkbox"/>	G23									8779.0
32												
33		<input checked="" type="checkbox"/>	G25	- Nbn								8777.0
34												
35		<input checked="" type="checkbox"/>	G27	- Vr 10 mm thick								8775.0
36												
37		<input checked="" type="checkbox"/>	G30									8773.0
38												
39		<input checked="" type="checkbox"/>										8771.0
40												
41		<input checked="" type="checkbox"/>										8769.0
42												
43		<input checked="" type="checkbox"/>										8767.0
44												
45		<input checked="" type="checkbox"/>										8765.0
46												
47		<input checked="" type="checkbox"/>										8763.0
48												
49		<input checked="" type="checkbox"/>										8761.0
50												

 <b>EBA Engineering Consultants Ltd.</b>	LOGGED BY: MD & RR	COMPLETION DEPTH: 58.5m
	REVIEWED BY: BC & JGD	COMPLETE: 11/4/2010
	DRAWING NO:	Page 2 of 3

Winter 2010 Instrumentation Program		CLIENT: Minto Explorations Ltd.		BOREHOLE NO: 10-SWFI-9						
Dry Stack Tailings Storage Facility		DRILL: Driftwood 3000 Diamond Drill-HQ Core		PROJECT NO: W14101068.012						
Minto Mine, YT		6944775N; 384431.1E; Zone 8		ELEVATION: 810.703m						
SAMPLE TYPE		<input checked="" type="checkbox"/> GRAB SAMPLE	<input type="checkbox"/> NO RECOVERY	<input checked="" type="checkbox"/> BULK	<input type="checkbox"/> CRREL CORE	<input type="checkbox"/> SHELBY TUBE	<input checked="" type="checkbox"/> GRAB CORE			
BACKFILL TYPE		<input checked="" type="checkbox"/> BENTONITE	<input type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input type="checkbox"/> SAND			
Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density(kg/m <sup>3</sup> )		PLASTIC M.C. LIQUID		Slope Indicator	Elevation (m)
					20 40 60 80	20 40 60 80	20 40 60 80	20 40 60 80		
50	CLAY (TILL)- silty, trace sand, medium plastic, dark grey		G31							760.0
51										759.0
52			G32							758.0
53	BEDROCK - 100 mm boulder, then highly weathered, dark grey									757.0
54										756.0
55										755.0
56										754.0
57										753.0
58										752.0
59	END OF BOREHOLE at 58.5 m - installed inclinometer to 754.4 m - azimuth of A+ direction is 29°									751.0
60										750.0
61										749.0
62										748.0
63										747.0
64										746.0
65										745.0
66										744.0
67										743.0
68										742.0
69										741.0
70										740.0
71										739.0
72										738.0
73										737.0
74										736.0
75										736.0



**EBA Engineering Consultants Ltd.**

LOGGED BY: MD & RR	COMPLETION DEPTH: 58.5m
REVIEWED BY: BC & JGD	COMPLETE: 11/4/2010
DRAWING NO:	Page 3 of 3

Winter 2010 Instrumentation Program		CLIENT: Minto Explorations Ltd.		BOREHOLE NO: 10-SWFI-10								
Dry Stack Tailings Storage Facility		DRILL: Driftwood 3000 Diamond Drill-HQ Core		PROJECT NO: W14101068.012								
Minto Mine, YT		6944856N; 384435.8E; Zone 8		ELEVATION: 810.014m								
SAMPLE TYPE		GRAB SAMPLE	NO RECOVERY	BULK	CRREL CORE	SHELBY TUBE	GRAB CORE					
BACKFILL TYPE		BENTONITE	PEA GRAVEL	SLOUGH	GROUT	DRILL CUTTINGS	SAND					
Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density (kg/m <sup>3</sup> )		PLASTIC M.C.		LIQUID		Slope Indicator	Elevation (m)
					20	40	60	80	20	40		
0	No recovery											810.0
1												809.0
2												808.0
3	SILT - some clay, some sand, trace gravel, medium plastic, dark grey, occasional gravel			- Nbn, abundant ice lenses <50 mm, clear								807.0
4			G1									806.0
5												805.0
6			G2	- Nbe - Abundant ice lenses <100 mm, clear								804.0
7	- slickensided											803.0
8			G3	- Occasional ice lenses <30 mm, clear								802.0
9	SAND (TILL) - silty, some to trace gravel, trace clay, poorly graded, dark grey											801.0
10	- some gravel, angular		G4	- Occasional ice lenses <20 mm, clear - Nbe								800.0
11												799.0
12			G5	- Ice lens, clear - Vr, <10 mm - Nbn, occasional ice lenses <15 mm thick, clear								798.0
13			G6									797.0
14			G7	- Nbn, occasional ice lenses <15 mm thick, clear								796.0
15												795.0
16			G8	- 15 mm ice lens, clear - Vr <2 mm thick								794.0
17	SILT and SAND (TILL) - trace clay, trace gravel, frozen, dark brown		G9									793.0
18												792.0
19			G10	- 25 mm ice lens, clear								791.0
20	- occasional gravel		G11									790.0



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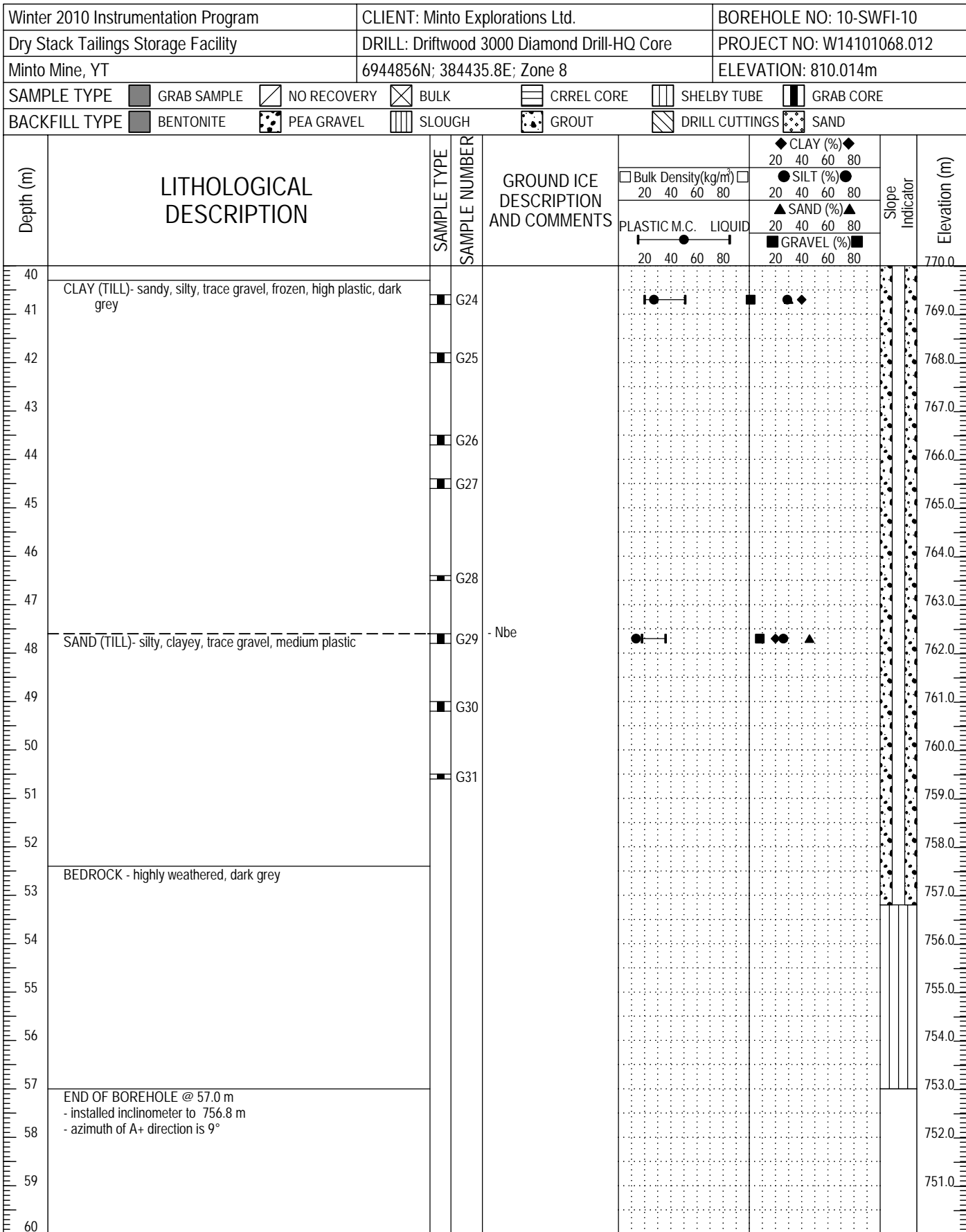
LOGGED BY: MD & RR	COMPLETION DEPTH: 57m
REVIEWED BY: BC & JGD	COMPLETE: 11/5/2010
DRAWING NO:	Page 1 of 3

Winter 2010 Instrumentation Program		CLIENT: Minto Explorations Ltd.		BOREHOLE NO: 10-SWFI-10				
Dry Stack Tailings Storage Facility		DRILL: Driftwood 3000 Diamond Drill-HQ Core		PROJECT NO: W14101068.012				
Minto Mine, YT		6944856N; 384435.8E; Zone 8		ELEVATION: 810.014m				
SAMPLE TYPE		GRAB SAMPLE	NO RECOVERY	BULK	CRREL CORE	SHELBY TUBE	GRAB CORE	
BACKFILL TYPE		BENTONITE	PEA GRAVEL	SLOUGH	GROUT	DRILL CUTTINGS	SAND	
Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density(kg/m <sup>3</sup> )		Slope Indicator	Elevation (m)
					PLASTIC M.C.	LIQUID		
					20 40 60 80	20 40 60 80		790.0
20								
21		■	G12					789.0
22				- 25 mm ice lens, clear				788.0
23	- granite pieces <100 mm	■	G13					787.0
24		■	G14	- Nbn, ice lenses				786.0
25								785.0
26	- occasional gravel	■	G15					784.0
27		■	G16					783.0
28								782.0
29		■	G17	- Ice lens				781.0
30		■	G18					780.0
31		■	G19					779.0
32								778.0
33		■	G20					777.0
34								776.0
35		■	G21					775.0
36		■	G22	- 75 mm ice lens, clear				774.0
37								773.0
38								772.0
39		■	G23					771.0
40								



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LOGGED BY: MD & RR	COMPLETION DEPTH: 57m
REVIEWED BY: BC & JGD	COMPLETE: 11/5/2010
DRAWING NO:	Page 2 of 3



END OF BOREHOLE @ 57.0 m  
 - installed inclinometer to 756.8 m  
 - azimuth of A+ direction is 9°



**EBA Engineering Consultants Ltd.**

LOGGED BY: MD & RR

REVIEWED BY: BC & JGD

DRAWING NO:

COMPLETION DEPTH: 57m

COMPLETE: 11/5/2010

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Winter 2010 Instrumentation Program		CLIENT: Minto Explorations Ltd.		BOREHOLE NO: 10-SWFI-11						
Dry Stack Tailings Storage Facility		DRILL: Driftwood 3000 Diamond Drill-HQ Core		PROJECT NO: W14101068.012						
Minto Mine, YT		6944847N; 384308.2E; Zone 8		ELEVATION: 827.565m						
SAMPLE TYPE		<input checked="" type="checkbox"/> GRAB SAMPLE	<input type="checkbox"/> NO RECOVERY	<input checked="" type="checkbox"/> BULK	<input type="checkbox"/> CRREL CORE	<input type="checkbox"/> SHELBY TUBE	<input checked="" type="checkbox"/> GRAB CORE			
BACKFILL TYPE		<input checked="" type="checkbox"/> BENTONITE	<input type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input type="checkbox"/> SAND			
Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density (kg/m <sup>3</sup> )		PLASTIC M.C. LIQUID		Slope Indicator	Elevation (m)
					20	40	60	80		
0	MUSKEG									827.0
1										826.0
2										825.0
3	ORGANICS - muskeg, some silt, some sand, frequent angular gravel, rootlets			- Nbe, Vc <10%, V<sub>v</sub> <2%						824.0
4			G1							823.0
5	- boulder									822.0
6										821.0
7	SAND (TILL) - silty, some gravel, poorly graded, dark grey			- Nf						820.0
8			G2							819.0
9	SILT (TILL) - sandy, some gravel, trace clay, non plastic, dark grey, occasional cobble			- Nf						818.0
10			G3							817.0
11			G4	- Nf, occasional Vs <20 mm thick, clear						816.0
12			G5	- Nf, Vx <1%						815.0
13	- sand, frequent cobbles <150 mm									814.0
14			G6	- Occasional Vs <15 mm thick, clear						813.0
15			G7							812.0
16	- frequent cobbles									811.0
17			G8	- 80 mm ice lens, clear - Nbn, frequent ice lenses <30 mm						810.0
18	- sand									809.0
19			G9	- Nbn						808.0
20										807.0
21			G10	- Nbn, Vr <1%						806.0
22										805.0
23			G11	- 20 mm ice lens, verticle, clear - Occasional ice lens <15 mm thick						804.0
24			G12							803.0
25	- low plastic									803.0
			G13							803.0



**EBA Engineering Consultants Ltd.**

LOGGED BY: MD & RR	COMPLETION DEPTH: 67.7m
REVIEWED BY: BC & JGD	COMPLETE: 11/6/2010
DRAWING NO:	Page 1 of 3

Winter 2010 Instrumentation Program		CLIENT: Minto Explorations Ltd.		BOREHOLE NO: 10-SWFI-11					
Dry Stack Tailings Storage Facility		DRILL: Driftwood 3000 Diamond Drill-HQ Core		PROJECT NO: W14101068.012					
Minto Mine, YT		6944847N; 384308.2E; Zone 8		ELEVATION: 827.565m					
SAMPLE TYPE		GRAB SAMPLE	NO RECOVERY	BULK	CRREL CORE	SHELBY TUBE	GRAB CORE		
BACKFILL TYPE		BENTONITE	PEA GRAVEL	SLOUGH	GROUT	DRILL CUTTINGS	SAND		
Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density(kg/m <sup>3</sup> )		CLAY (%)	Slope Indicator	Elevation (m)
					20 40 60 80	20 40 60 80	20 40 60 80		
					PLASTIC M.C.	LIQUID	SILT (%)		
					20 40 60 80	20 40 60 80	20 40 60 80		
							SAND (%)		
							20 40 60 80		
							GRAVEL (%)		
							20 40 60 80		
25				- Nbn					802.0
26		G14							801.0
27									800.0
28		G15							799.0
29				- Nbn					798.0
30		G16							797.0
31				- 15 mm ice lens					796.0
32		G17							795.0
33									794.0
34		G18							793.0
35	- slight increase in clay content								792.0
36		G19							791.0
37									790.0
38	- boulder, granite ~150 mm	G20							789.0
39									788.0
40		G21							787.0
41									786.0
42		G22		- Ice lens, clear					785.0
43									784.0
44		G23		- 75 mm ice lens, clear					783.0
45									782.0
46		G24							781.0
47									780.0
48	CLAY (TILL)- sandy, silty, trace gravel, medium plastic, frozen, grey, occasional weathered bedrock particles ~ 150 mm long	G25							779.0
49									778.0
50		G26							
		G27							
		G28							
		G29							
		G30							



**EBA Engineering Consultants Ltd.**

LOGGED BY: MD & RR	COMPLETION DEPTH: 67.7m
REVIEWED BY: BC & JGD	COMPLETE: 11/6/2010
DRAWING NO:	Page 2 of 3

Winter 2010 Instrumentation Program		CLIENT: Minto Explorations Ltd.		BOREHOLE NO: 10-SWFI-11									
Dry Stack Tailings Storage Facility		DRILL: Driftwood 3000 Diamond Drill-HQ Core		PROJECT NO: W14101068.012									
Minto Mine, YT		6944847N; 384308.2E; Zone 8		ELEVATION: 827.565m									
SAMPLE TYPE		<input checked="" type="checkbox"/> GRAB SAMPLE	<input type="checkbox"/> NO RECOVERY	<input checked="" type="checkbox"/> BULK	<input type="checkbox"/> CRREL CORE	<input type="checkbox"/> SHELBY TUBE	<input checked="" type="checkbox"/> GRAB CORE						
BACKFILL TYPE		<input checked="" type="checkbox"/> BENTONITE	<input checked="" type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input checked="" type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input checked="" type="checkbox"/> SAND						
Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density(kg/m <sup>3</sup> )		PLASTIC M.C.		LIQUID		Slope Indicator	Elevation (m)	
					20	40	60	80	20	40			60
50	- weathered rock		G31	- Vx								777.0	
51			G32										776.0
52			G33										775.0
53			G34										774.0
54			G35										773.0
55			G36										772.0
56			G37										771.0
57	- becomes gravelly		G31	- Vx								770.0	
58			G32										769.0
59			G33										768.0
60			G34										767.0
61			G35										766.0
62			G36										765.0
63			G37										764.0
64	BEDROCK - weathered, frozen, light brown											763.0	
65												762.0	
66												761.0	
67												760.0	
68												759.0	
69												758.0	
70												757.0	
71	END OF BOREHOLE @ 67.7 m - installed inclinometer to 762.3 m - azimuth of A+ direction is 350°											756.0	
72												755.0	
73												754.0	
74												753.0	
75													



**EBA Engineering Consultants Ltd.**


LOGGED BY: MD & RR	COMPLETION DEPTH: 67.7m
REVIEWED BY: BC & JGD	COMPLETE: 11/6/2010
DRAWING NO:	Page 3 of 3



Winter 2011 Geotechnical Drilling	CLIENT: Minto Explorations Ltd.	BOREHOLE NO: 11-G05b
Pelly Laydown (SW Waste Dump)	DRILL: 3000 Diamond Drill, HQ Core	PROJECT NO: W14101068.033
Minto Mine, YT	6944820N; 383817E; Zone 8	ELEVATION: 861.7m

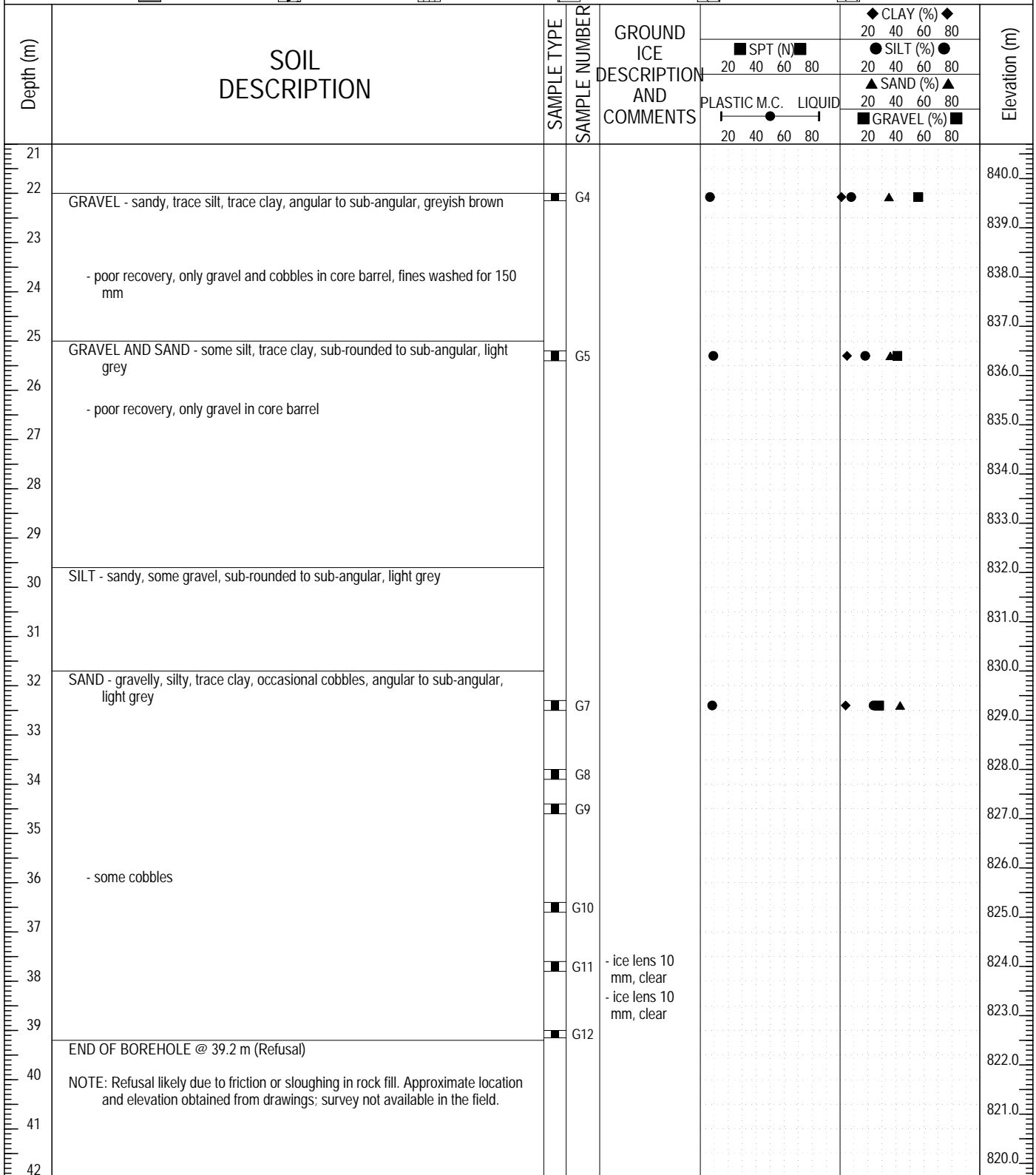
SAMPLE TYPE	<input checked="" type="checkbox"/> GRAB SAMPLE	<input type="checkbox"/> NO RECOVERY	<input type="checkbox"/> BULK	<input type="checkbox"/> CRREL CORE	<input type="checkbox"/> SHELBY TUBE	<input type="checkbox"/> GRAB CORE
BACKFILL TYPE	<input type="checkbox"/> BENTONITE	<input type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input type="checkbox"/> SAND


Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	SPT (N)		PLASTIC M.C.		LIQUID		Elevation (m)
					20	40	20	40	60	80	
0	ROCK FILL - no samples taken due to problems with coring										861.0
1											860.0
2											859.0
3											858.0
4											857.0
5											856.0
6											855.0
7											854.0
8											853.0
9											852.0
10											851.0
11											850.0
12											849.0
13											848.0
14											847.0
15											846.0
16											845.0
17											844.0
18	SAND - gravelly, silty, trace clay, angular to sub-angular, brownish grey	<input checked="" type="checkbox"/>	G1								844.0
19		<input checked="" type="checkbox"/>	G2			●		◆	●	■	843.0
20											842.0
21		<input checked="" type="checkbox"/>	G3								841.0

 A TETRA TECH COMPANY	LOGGED BY: AT & SMC	COMPLETION DEPTH: 39.2m
	REVIEWED BY: JGD	COMPLETE: 1/18/2011
	DRAWING NO:	Page 1 of 2

Winter 2011 Geotechnical Drilling	CLIENT: Minto Explorations Ltd.	BOREHOLE NO: 11-G05b
Pelly Laydown (SW Waste Dump)	DRILL: 3000 Diamond Drill, HQ Core	PROJECT NO: W14101068.033
Minto Mine, YT	6944820N; 383817E; Zone 8	ELEVATION: 861.7m

SAMPLE TYPE	GRAB SAMPLE	NO RECOVERY	BULK	CRREL CORE	SHELBY TUBE	GRAB CORE
BACKFILL TYPE	BENTONITE	PEA GRAVEL	SLOUGH	GROUT	DRILL CUTTINGS	SAND




	LOGGED BY: AT & SMC	COMPLETION DEPTH: 39.2m
	REVIEWED BY: JGD	COMPLETE: 1/18/2011
	DRAWING NO:	Page 2 of 2

Winter 2011 Geotechnical Drilling	CLIENT: Minto Explorations Ltd.	BOREHOLE NO: 11-G06
Pelly Laydown (SW Waste Dump)	DRILL: 3000 Diamond Drill, HQ Core	PROJECT NO: W14101068.033
Minto Mine, YT	6944819N; 383970E; Zone 8	ELEVATION: 860.5m

SAMPLE TYPE	GRAB SAMPLE	NO RECOVERY	BULK	CRREL CORE	SHELBY TUBE	GRAB CORE
BACKFILL TYPE	BENTONITE	PEA GRAVEL	SLOUGH	GROUT	DRILL CUTTINGS	SAND


Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	SPT (N)		PLASTIC M.C. LIQUID		CLAY (%)		SILT (%)		SAND (%)		GRAVEL (%)		Elevation (m)
					20	40	20	40	20	40	60	80	20	40	60	80	
0	SAND FILL		G1														860.0
1	ROCK FILL																859.0
2																	858.0
3																	857.0
4																	856.0
5																	855.0
6																	854.0
7																	853.0
8																	852.0
9																	851.0
10																	850.0
11																	849.0
12																	848.0
13	SILT - some sand, some gravel, gravel <10 mm in diameter, angular to sub-angular, low plastic, dark brown, frequent organic peat inclusions		G2														847.0
14																	846.0
15																	845.0
16	GRAVEL - silty, sandy, some clay, rounded to sub-angular, dark brown		G3														844.0
17																	843.0
18			G4														842.0
19	SAND - gravelly, trace silt and clay, dark brown		G5														841.0
20	- boulder																840.0
21	- some cobbles, rounded to sub-rounded																839.0
22	- hard drilling																838.0
23	SILT - sandy, some gravel, trace clay, compact to dense, non to low plastic, dark brown		G6														837.0
24																	836.0
25																	835.0
26			G7														834.0
27																	833.0
28	END OF BOREHOLE @ 27.2 m (Refusal)		G8														832.0
29																	831.0
30																	831.0

	LOGGED BY: AT & SMC	COMPLETION DEPTH: 27.15m
	REVIEWED BY: JGD	COMPLETE: 1/22/2011
	DRAWING NO:	Page 1 of 1

Winter 2011 Geotechnical Drilling	CLIENT: Minto Explorations Ltd.	BOREHOLE NO: 11-G07
Pelly Laydown (SW Waste Dump)	DRILL: 3000 Diamond Drill, HQ Core	PROJECT NO: W14101068.033
Minto Mine, YT	6944805.928N; 384054.999E; Zone 8	ELEVATION: 858.878m

SAMPLE TYPE	GRAB SAMPLE	NO RECOVERY	BULK	CRREL CORE	SHELBY TUBE	GRAB CORE
BACKFILL TYPE	BENTONITE	PEA GRAVEL	SLOUGH	GROUT	DRILL CUTTINGS	SAND


Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	SPT (N)		PLASTIC M.C.		LIQUID		Elevation (m)
					20	40	20	40	60	80	
0	ROCK FILL										858.0
1											857.0
2											856.0
3	- boulder										855.0
4											854.0
5											853.0
6											852.0
7											851.0
8											850.0
9	SILT - sandy, some gravel, low plastic, dark blackish grey										850.0
10	- cobble	G1		- Nbn							849.0
10	SAND - silty, some gravel, fine grained sand, poorly graded, dark grey	G2									848.0
11	- trace gravel										847.0
12											846.0
13	CLAY - silty, medium plastic, dark grey	G3		- Nbn							846.0
13	SAND - silty, some gravel, fine grained sand, poorly graded, dark grey			- Nbn							845.0
14											844.0
15		G4									844.0
16											843.0
17	CLAY - silty, trace sand, medium plastic, dark grey	G5		- Vs <30%, clear							842.0
18	- trace gravel	G6									841.0
19		G7									840.0
20	SILT - some sand, trace clay, trace gravel, non plastic, brownish grey			- 20 mm ice lens, clear							839.0
21		G8		- Nbn							838.0
22											837.0
23	- sandy, some gravel, sub-angular to angular gravel, occasional cobbles	G9		- Nbn, Vs							836.0
23	- cobble										835.0
24				- 20 mm ice lens, clear							835.0
25	- gravelly	G10		- Nbn							834.0
25				- Vx <2%							833.0
26	- cobble										833.0
27		G11		- 15 mm ice lens, clear							832.0
27	- some clay	G12		- 50 mm ice lens, clear							831.0
28				- 40 mm ice lens, clear							830.0
29	- cobble	G13		- 10 mm ice							829.0

	LOGGED BY: AT & SMC	COMPLETION DEPTH: 55.47m
	REVIEWED BY: JGD	COMPLETE: 1/22/2011
	DRAWING NO:	Page 1 of 2

Winter 2011 Geotechnical Drilling	CLIENT: Minto Explorations Ltd.	BOREHOLE NO: 11-G07
Pelly Laydown (SW Waste Dump)	DRILL: 3000 Diamond Drill, HQ Core	PROJECT NO: W14101068.033
Minto Mine, YT	6944805.928N; 384054.999E; Zone 8	ELEVATION: 858.878m

SAMPLE TYPE	GRAB SAMPLE	NO RECOVERY	BULK	CRREL CORE	SHELBY TUBE	GRAB CORE
BACKFILL TYPE	BENTONITE	PEA GRAVEL	SLOUGH	GROUT	DRILL CUTTINGS	SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	SPT (N)		PLASTIC M.C. LIQUID		CLAY (%) SILT (%) SAND (%) GRAVEL (%)		Elevation (m)
					20 40 60 80	20 40 60 80	20 40 60 80	20 40 60 80	20 40 60 80	20 40 60 80	
30	- cobble		G14	lens, clear							828.0
31			G15	- 20 mm ice lens, clear							827.0
32			G16	- 10 mm ice lens, clear							826.0
33	- cobble		G17	- 30 mm ice lens, clear							825.0
34	- some gravel, angular, medium plastic, grey		G19	- Vs <1%							824.0
35			G20	- 60 mm ice lens, clear							823.0
36	- gravelly, some cobbles		G21	- 90 mm ice lens, clear							822.0
37			G22	- ice lens, clear							821.0
38	- boulder		G23	- 20 mm ice lens, clear							820.0
39			G24								819.0
40			G25								818.0
41			G26								817.0
42			G27								816.0
43	- strong odour, frequent brown organics		G28								815.0
44	SAND and SILT - trace gravel, trace clay, angular, non plastic, dark blackish grey		G29	- Nbn, Vx <1%							814.0
45	- abundant coarse sand seams										813.0
46	- cobble			- 40 mm ice lens, clear							812.0
47				- 100 mm ice lens, clear							811.0
48	- cobble										810.0
49	- some gravel, sub-rounded to sub-angular										809.0
50	- increased sand content										808.0
51	- gravelly, sub-angular to sub-rounded, dark grey										807.0
52											806.0
53	- boulder			- Nbn							805.0
54	SAND (RESIDUUM)- silty, gravelly, trace clay, poorly graded, gravel <30 mm in diameter, sub-angular to angular, grey										804.0
55	WEATHERED BEDROCK - fractured bedrock										803.0
56	END OF BOREHOLE @ 55.5 m - CONFIRMED BEDROCK										802.0
57											801.0
58											800.0
59											799.0
60											799.0

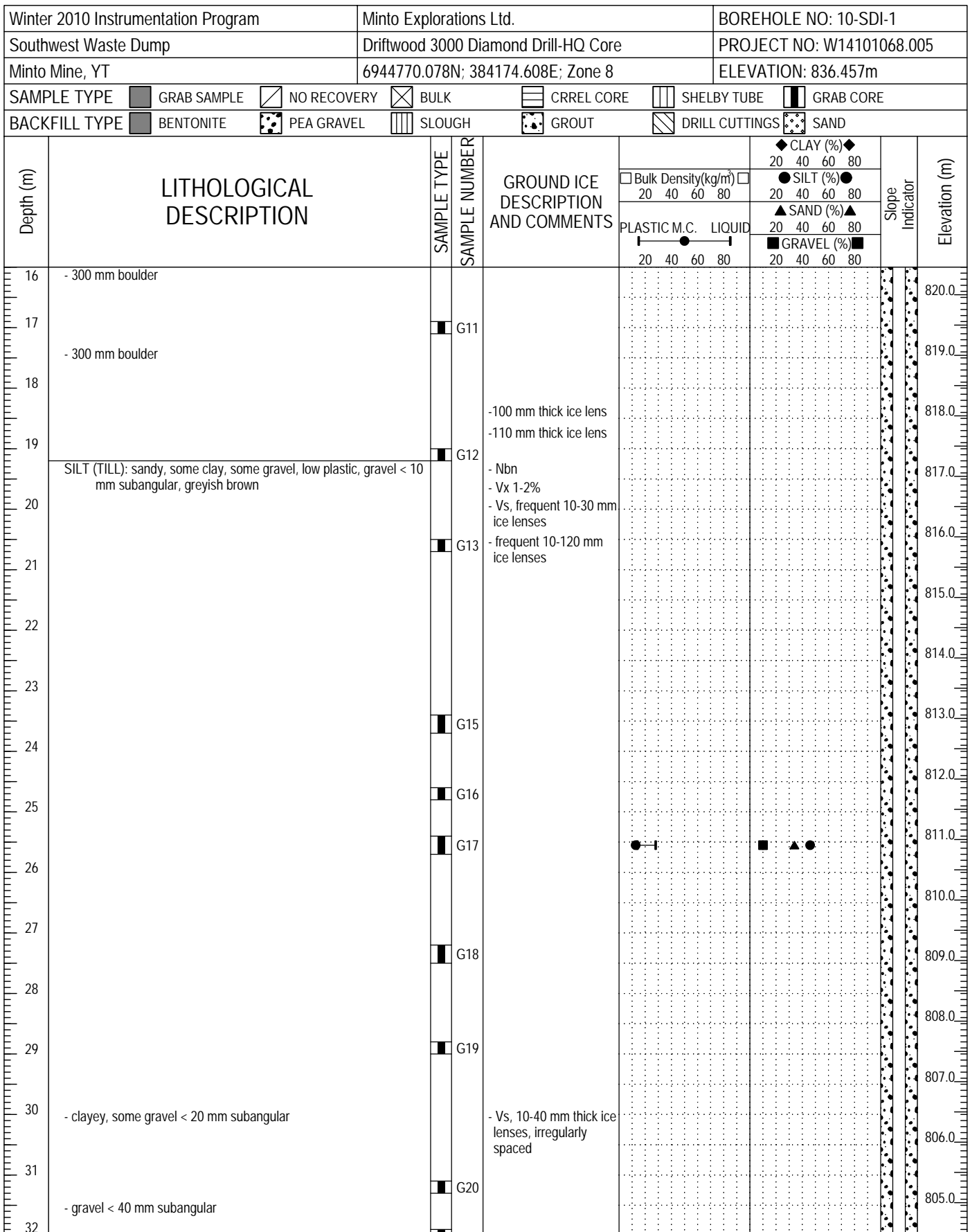
	LOGGED BY: AT & SMC	COMPLETION DEPTH: 55.47m
	REVIEWED BY: JGD	COMPLETE: 1/22/2011
	DRAWING NO:	Page 2 of 2

Winter 2010 Instrumentation Program		Minto Explorations Ltd.		BOREHOLE NO: 10-SDI-1						
Southwest Waste Dump		Driftwood 3000 Diamond Drill-HQ Core		PROJECT NO: W14101068.005						
Minto Mine, YT		6944770.078N; 384174.608E; Zone 8		ELEVATION: 836.457m						
SAMPLE TYPE		<input checked="" type="checkbox"/> GRAB SAMPLE	<input type="checkbox"/> NO RECOVERY	<input checked="" type="checkbox"/> BULK	<input type="checkbox"/> CRREL CORE	<input type="checkbox"/> SHELBY TUBE	<input checked="" type="checkbox"/> GRAB CORE			
BACKFILL TYPE		<input checked="" type="checkbox"/> BENTONITE	<input type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input type="checkbox"/> SAND			
Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density(kg/m <sup>3</sup> )		PLASTIC M.C. LIQUID		Slope Indicator	Elevation (m)
					20	40	60	80		
0	WASTE ROCK FILL									836.0
1										835.0
2	ORGANICS: peat, some fine fibers, trace wood pieces and rootlets, dark brown	<input checked="" type="checkbox"/>	G1	- Nbe - Vr < 2%, 1 mm thick lenses						834.0
3	SAND: some gravel, trace silt, well graded sand, gravel < 20 mm subangular, brown - cobbles < 100 mm, angular	<input checked="" type="checkbox"/>	G2	- Nbn - Vx < 2%						833.0
4		<input checked="" type="checkbox"/>	G3							832.0
5	- 300 mm boulder									831.0
6		<input checked="" type="checkbox"/>	G4							830.0
7	SAND (TILL): silty, some gravel, trace sand, gravel < 20 mm subangular, greyish brown, frequent 100-200 mm cobbles	<input checked="" type="checkbox"/>	G4	- Nbn - Vx < 1-2%						829.0
8		<input checked="" type="checkbox"/>	G5		●	□	◆	●	▲	828.0
9	- clayey									827.0
10		<input checked="" type="checkbox"/>	G6	- Vr < 5%, approx. 1 mm thick lenses						826.0
11		<input checked="" type="checkbox"/>	G7							825.0
12		<input checked="" type="checkbox"/>	G8	- Vs, 1-2 mm thick ice lenses						824.0
13	- some clay	<input checked="" type="checkbox"/>	G9	- Vs, 5-15 mm thick ice lenses						823.0
14		<input checked="" type="checkbox"/>	G9							822.0
15		<input checked="" type="checkbox"/>	G10							821.0
16		<input checked="" type="checkbox"/>	G10							821.0



**EBA Engineering Consultants Ltd.**

LOGGED BY: JSB & MD	COMPLETION DEPTH: 60m
REVIEWED BY: JPB	COMPLETE: 2/3/2010
DRAWING NO:	Page 1 of 4



**EBA Engineering Consultants Ltd.**

LOGGED BY: JSB & MD	COMPLETION DEPTH: 60m
REVIEWED BY: JPB	COMPLETE: 2/3/2010
DRAWING NO:	Page 2 of 4

Winter 2010 Instrumentation Program		Minto Explorations Ltd.		BOREHOLE NO: 10-SDI-1					
Southwest Waste Dump		Driftwood 3000 Diamond Drill-HQ Core		PROJECT NO: W14101068.005					
Minto Mine, YT		6944770.078N; 384174.608E; Zone 8		ELEVATION: 836.457m					
SAMPLE TYPE		GRAB SAMPLE	NO RECOVERY	BULK	CRREL CORE	SHELBY TUBE	GRAB CORE		
BACKFILL TYPE		BENTONITE	PEA GRAVEL	SLOUGH	GROUT	DRILL CUTTINGS	SAND		
Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density(kg/m <sup>3</sup> )		CLAY (%)	Slope Indicator	Elevation (m)
					20 40 60 80	20 40 60 80	20 40 60 80		
					PLASTIC M.C.	LIQUID	SILT (%)		
					20 40 60 80	20 40 60 80	20 40 60 80		
							SAND (%)		
							20 40 60 80		
							GRAVEL (%)		
							20 40 60 80		
32			G21						804.0
33									803.0
34			G22						802.0
35									801.0
36	- some sand, fine grained sand, massive to thinly bedded, low plastic, dark grey		G24	- Nbn					800.0
37	- trace slickensides								799.0
	- coarse sand lens, clean, well graded, medium grained, dark grey			- trace clear ice infill					798.0
38	CLAY (TILL): silty, some sand, trace coarse grained gravel, gravel < 50 mm subangular		G23						797.0
39	- sand pocket, well graded, medium grained, black								796.0
40	- high plastic		G25	- Nbn					795.0
41	- clayey, some fine sand, trace fine gravel, dark grey			- Vs, 4-5 mm thick ice lenses					794.0
42			G26	- Vs, 6 mm thick ice lens					793.0
43				- Nbn					792.0
44	- 120 mm cobble		G27	- Vs, 5 mm thick ice lens					791.0
45	- some medium to fine grained sand								790.0
46			G28						789.0
47	- 100 mm cobbles, intermittent clayey silt bedding planes								
48	- some clay								



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LOGGED BY: JSB & MD	COMPLETION DEPTH: 60m
REVIEWED BY: JPB	COMPLETE: 2/3/2010
DRAWING NO:	Page 3 of 4



Winter 2010 Instrumentation Program		Minto Explorations Ltd.		BOREHOLE NO: 10-SDI-1				
Southwest Waste Dump		Driftwood 3000 Diamond Drill-HQ Core		PROJECT NO: W14101068.005				
Minto Mine, YT		6944770.078N; 384174.608E; Zone 8		ELEVATION: 836.457m				
SAMPLE TYPE		<input checked="" type="checkbox"/> GRAB SAMPLE	<input type="checkbox"/> NO RECOVERY	<input checked="" type="checkbox"/> BULK	<input type="checkbox"/> CRREL CORE	<input type="checkbox"/> SHELBY TUBE	<input checked="" type="checkbox"/> GRAB CORE	
BACKFILL TYPE		<input checked="" type="checkbox"/> BENTONITE	<input type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input type="checkbox"/> SAND	
Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density(kg/m <sup>3</sup> )		Slope Indicator	Elevation (m)
					PLASTIC M.C.	LIQUID		
					20 40 60 80	20 40 60 80		
48	- 70 mm thick sand seam							788.0
49								787.0
50	SAND: gravely, some to trace silt, coarse grained sand, brown							786.0
51	- gravel < 60 mm			- Nf				785.0
52								784.0
53	- gravelly							783.0
	- oxidized zone, reddish brown							782.0
	- grey							781.0
54	GRAVEL (RESIDUUM): sandy, trace silt, coarse grained, angular, matrix supported							780.0
	BEDROCK: granite, diagonal fracture, oxide staining 500 mm							779.0
55	- granite, medium strong, faintly weathered, close spaced discontinuities, good quality, grey, diagonal fractures, coarse grained infill 3-20 mm thick							778.0
56	- occasional quartz inclusions							777.0
57								776.0
58								775.0
59	- medium grained, weak to very weak, slightly weathered							774.0
60	END OF BOREHOLE at 60.0 m							773.0
	- set HW casing 1.2 m below OG							
	- installed inclinometer to 776.4 m							
	- azimuth of A+ direction is 0°							
61								
62								
63								
64								



**EBA Engineering Consultants Ltd.**

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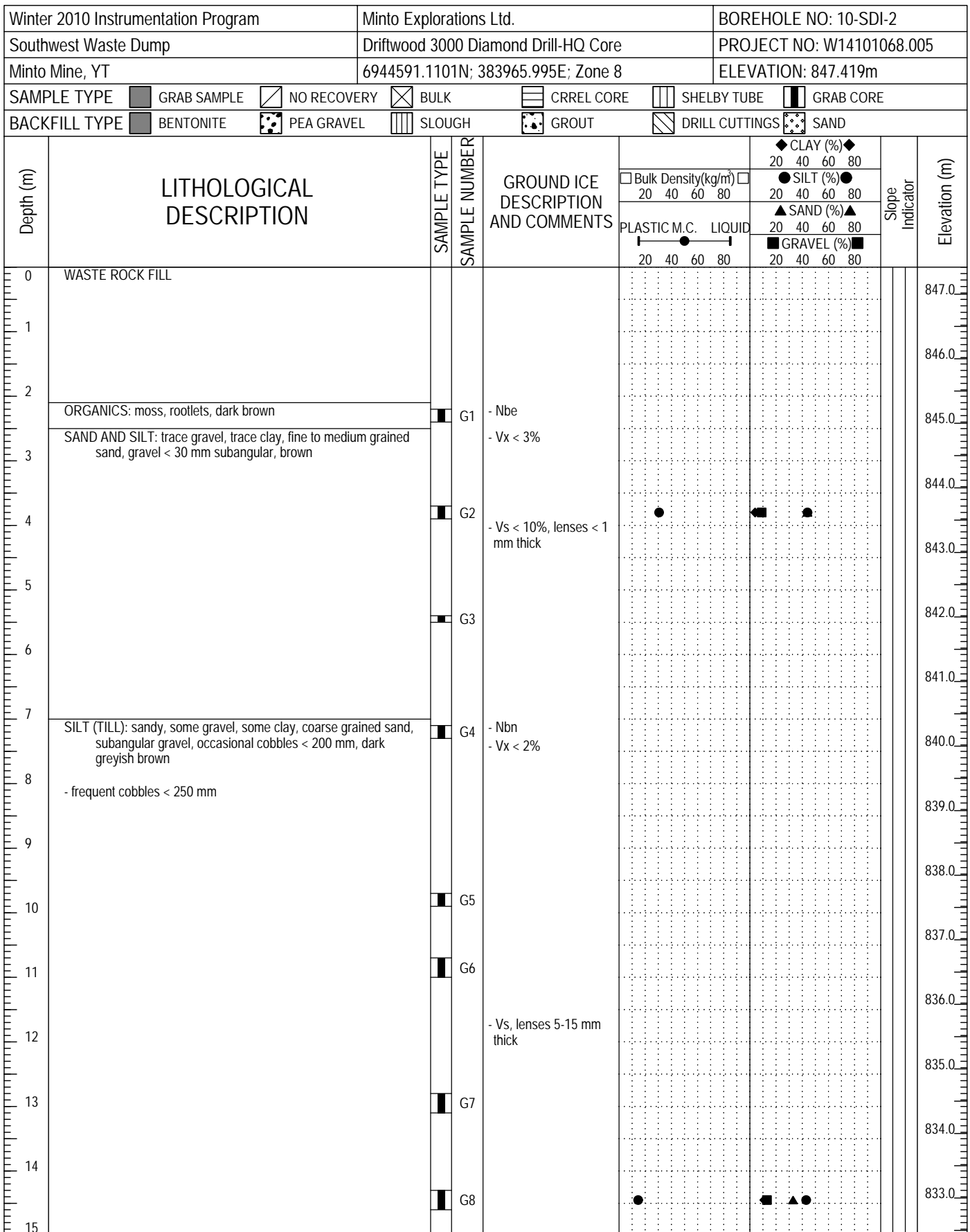
REVIEWED BY: JPB

DRAWING NO:

COMPLETION DEPTH: 60m

COMPLETE: 2/3/2010

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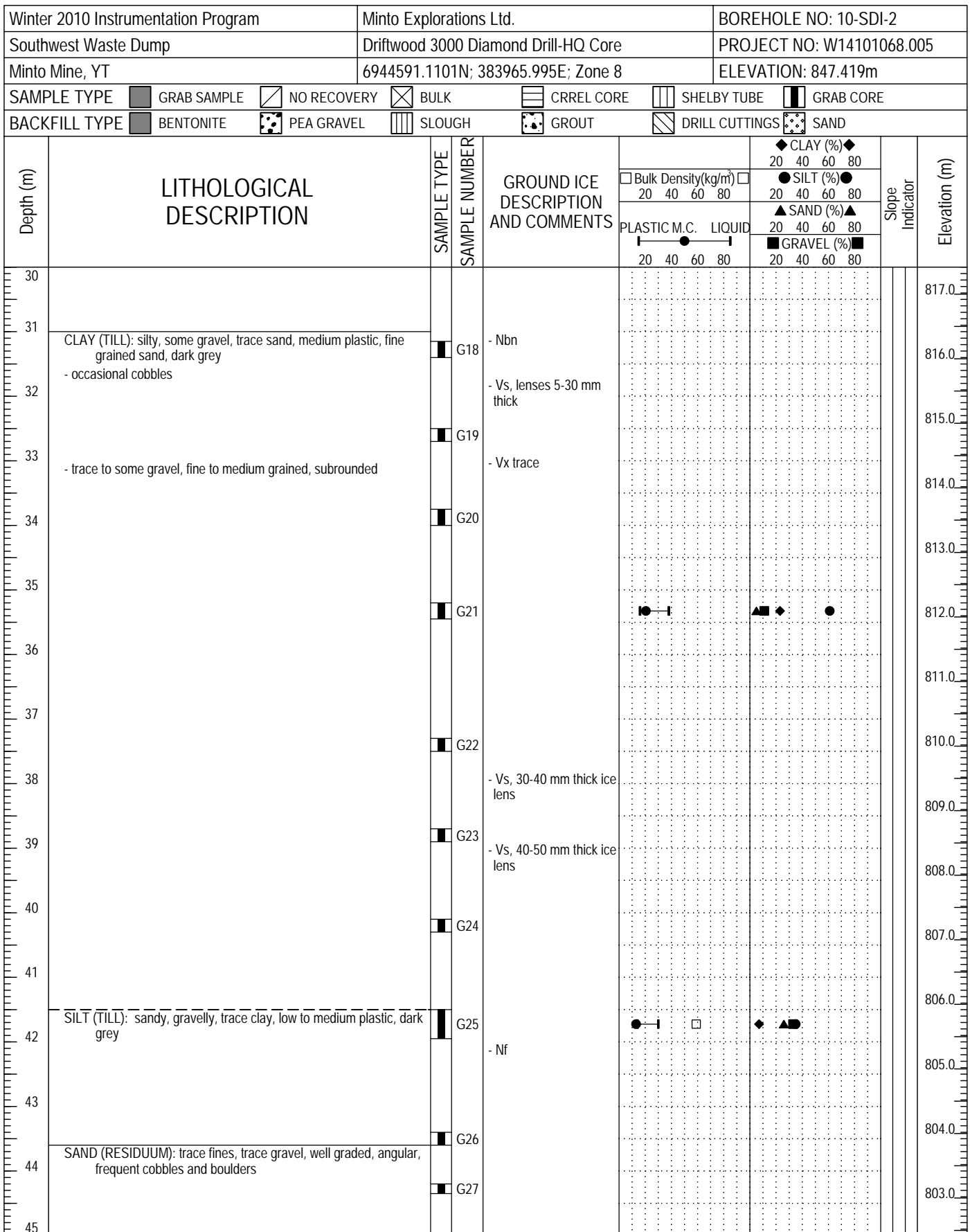
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REVIEWED BY: JPB	COMPLETE: 1/31/2010
DRAWING NO:	Page 1 of 4

Winter 2010 Instrumentation Program		Minto Explorations Ltd.		BOREHOLE NO: 10-SDI-2								
Southwest Waste Dump		Driftwood 3000 Diamond Drill-HQ Core		PROJECT NO: W14101068.005								
Minto Mine, YT		6944591.1101N; 383965.995E; Zone 8		ELEVATION: 847.419m								
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BACKFILL TYPE		<input checked="" type="checkbox"/> BENTONITE	<input type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input type="checkbox"/> SAND					
Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density(kg/m <sup>3</sup> )		PLASTIC M.C.		LIQUID		Slope Indicator	Elevation (m)
					20	40	60	80	20	40		
15												832.0
16			G9	- Nbn - Vx < 5%								831.0
17												830.0
18			G10									829.0
19			G11									828.0
20												827.0
21			G12									826.0
22												825.0
23												824.0
24	- cobble		G13 G14	- Nbn - Vx trace - Vs, lenses 4-25 mm thick								823.0
25			G15									822.0
26												821.0
27												820.0
28			G16									819.0
29												818.0
30			G17									818.0



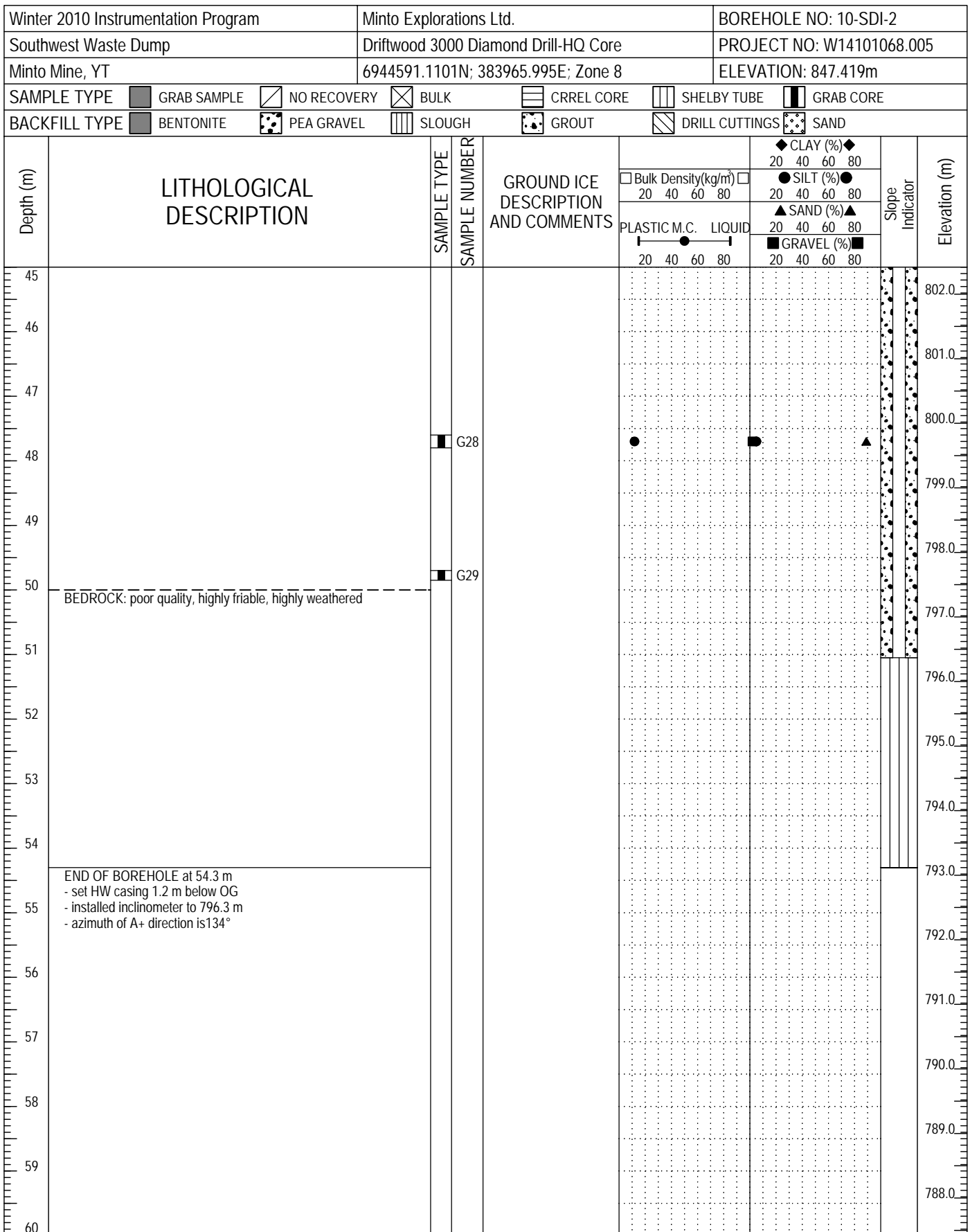
**EBA Engineering Consultants Ltd.**

LOGGED BY: JSB & MD	COMPLETION DEPTH: 54.3m
REVIEWED BY: JPB	COMPLETE: 1/31/2010
DRAWING NO:	Page 2 of 4



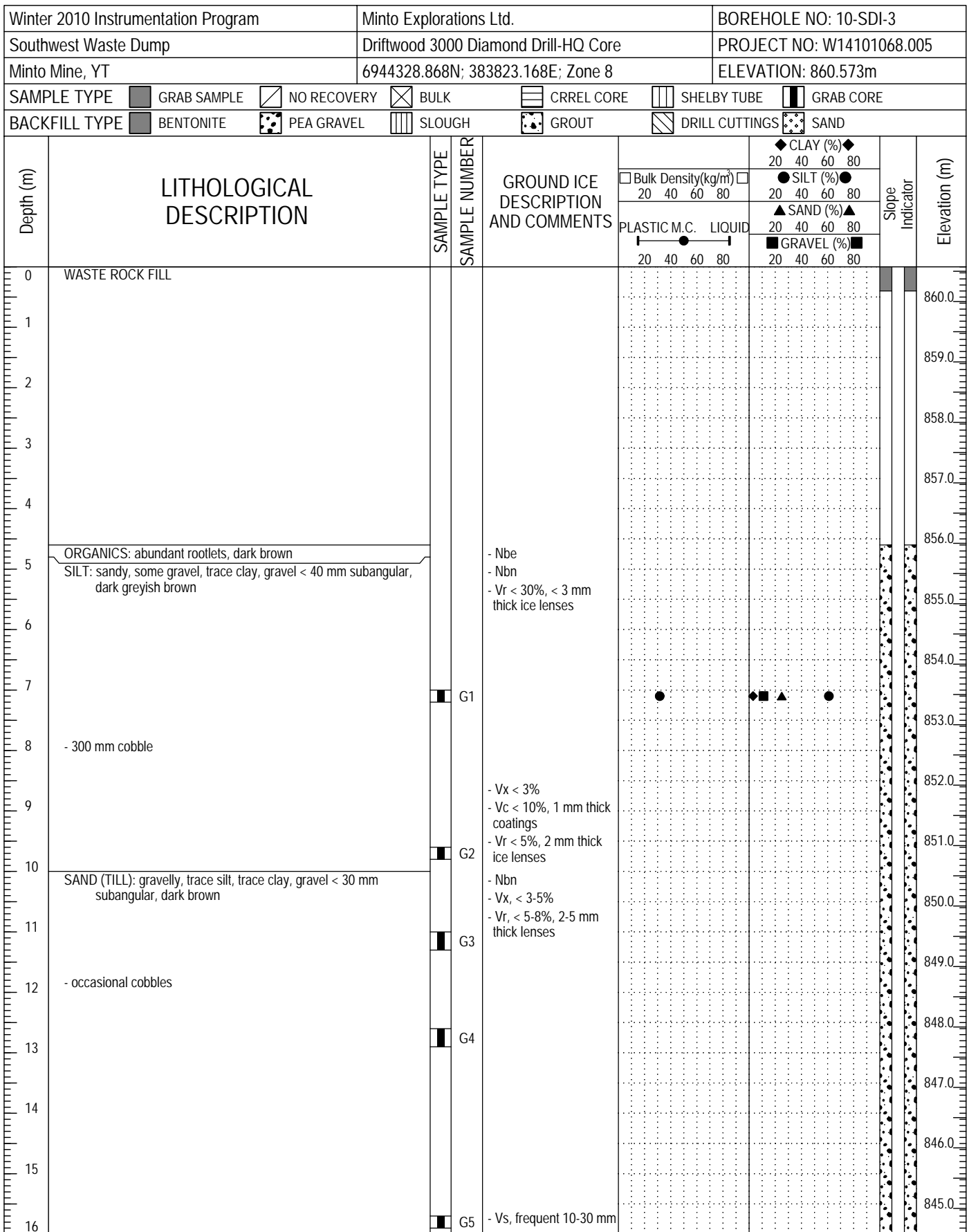
**EBA Engineering Consultants Ltd.**

LOGGED BY: JSB & MD	COMPLETION DEPTH: 54.3m
REVIEWED BY: JPB	COMPLETE: 1/31/2010
DRAWING NO:	Page 3 of 4



**EBA Engineering Consultants Ltd.**

LOGGED BY: JSB & MD	COMPLETION DEPTH: 54.3m
REVIEWED BY: JPB	COMPLETE: 1/31/2010
DRAWING NO:	Page 4 of 4



**EBA Engineering Consultants Ltd.**

LOGGED BY: JSB & MD

REVIEWED BY: JPB

DRAWING NO:

COMPLETION DEPTH: 46.6m

COMPLETE: 1/29/2010

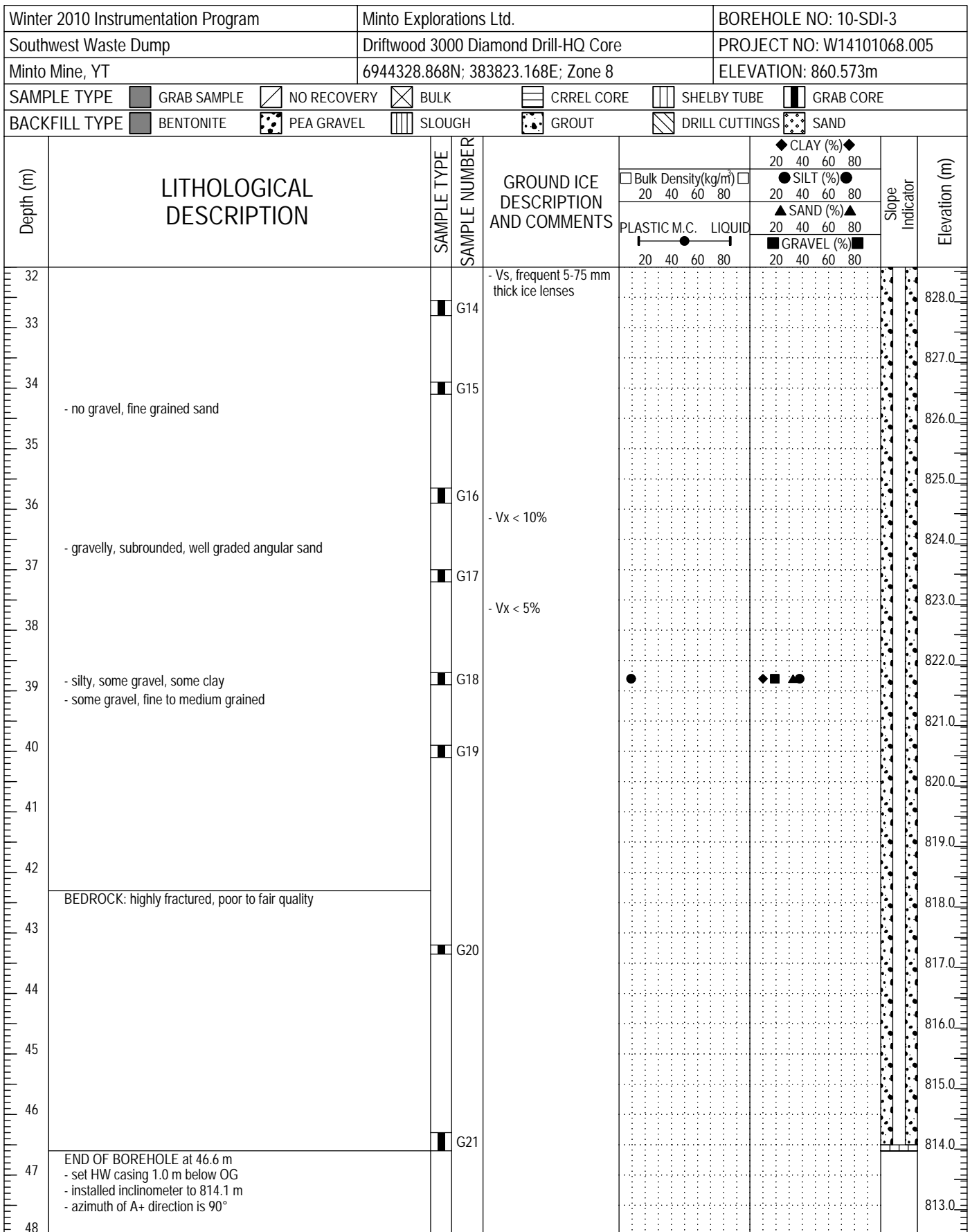
Page 1 of 3

Winter 2010 Instrumentation Program		Minto Explorations Ltd.		BOREHOLE NO: 10-SDI-3				
Southwest Waste Dump		Driftwood 3000 Diamond Drill-HQ Core		PROJECT NO: W14101068.005				
Minto Mine, YT		6944328.868N; 383823.168E; Zone 8		ELEVATION: 860.573m				
SAMPLE TYPE		GRAB SAMPLE	NO RECOVERY	BULK	CRREL CORE	SHELBY TUBE	GRAB CORE	
BACKFILL TYPE		BENTONITE	PEA GRAVEL	SLOUGH	GROUT	DRILL CUTTINGS	SAND	
Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density(kg/m <sup>3</sup> )		Slope Indicator	Elevation (m)
					PLASTIC M.C.	LIQUID		
					20 40 60 80	20 40 60 80		
					20 40 60 80	20 40 60 80		
					20 40 60 80	20 40 60 80		
					20 40 60 80	20 40 60 80		
16				thick ice lenses				844.0
17								843.0
18			G6					842.0
19			G7					841.0
20			G8					840.0
21								839.0
22			G9					838.0
23			G10					837.0
24			G11					836.0
25	- 200 mm cobble							835.0
26	- gravelly < 15 mm, subangular							834.0
27	- gravel < 40 mm, subangular		G12					833.0
28								832.0
29				- Nbn - Vx 2% - Vs < 5%, 20 mm thick ice lenses				831.0
30			G13					830.0
31								829.0
32	- trace to no gravel			- Nbn - Vx < 5%				



**EBA Engineering Consultants Ltd.**

LOGGED BY: JSB & MD	COMPLETION DEPTH: 46.6m
REVIEWED BY: JPB	COMPLETE: 1/29/2010
DRAWING NO:	Page 2 of 3



**EBA Engineering Consultants Ltd.**

LOGGED BY: JSB & MD	COMPLETION DEPTH: 46.6m
REVIEWED BY: JPB	COMPLETE: 1/29/2010
DRAWING NO:	Page 3 of 3



Winter 2010 Instrumentation Program		Minto Explorations Ltd.		BOREHOLE NO: 10-SDT/P-2					
Southwest Waste Dump		Driftwood 3000 Diamond Drill-HQ Core		PROJECT NO: W14101068.005					
Minto Mine, YT		6944595.056N; 383971.298E; Zone 8		ELEVATION: 847.114m					
SAMPLE TYPE		<input checked="" type="checkbox"/> GRAB SAMPLE	<input type="checkbox"/> NO RECOVERY	<input checked="" type="checkbox"/> BULK	<input type="checkbox"/> CRREL CORE	<input type="checkbox"/> SHELBY TUBE	<input checked="" type="checkbox"/> GRAB CORE		
BACKFILL TYPE		<input checked="" type="checkbox"/> BENTONITE	<input type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input type="checkbox"/> SAND		
Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	<input type="checkbox"/> Bulk Density(kg/m <sup>3</sup> ) <input type="checkbox"/> PLASTIC M.C. LIQUID 20 40 60 80		<input checked="" type="checkbox"/> CLAY (%) 20 40 60 80	Vibrating Wire Vibrating Wire Thermistor	Elevation (m)
					<input type="checkbox"/> SILT (%) 20 40 60 80	<input type="checkbox"/> SAND (%) 20 40 60 80	<input type="checkbox"/> GRAVEL (%) 20 40 60 80		
0	WASTE ROCK FILL								847.0
1									846.0
2									845.0
3	ORGANICS: moss rootlets, dark brown		G1	- Nbn					844.0
4	SAND: gravelly, silty, well graded, subrounded gravel, medium brown		G2	- Vx < 5%					843.0
5	- no gravels below 4.5 m, fine to medium grained sand, olive grey to blackish		G3						842.0
6	- gravelly fine to medium grained subrounded, sand angular, some cobbles		G4						841.0
7			G4	- Nbn					840.0
8	SAND (TILL): some gravel, trace silt, fine grained sand, gravel < 20 mm, subangular, dark greyish brown		G5	- Vx < 5%, lenses 10-15 mm thick					839.0
9			G5	- Nbn					838.0
10			G6	- Vx < 2%					837.0
11			G7	- Vs < 5%, lenses 5-10 mm thick					836.0
12			G7						835.0
13			G8	- Vs, lenses 10-25 mm thick					834.0
14			G8						833.0
15	END OF BOREHOLE at 14.6 m		G9						832.0
16	- backfilled with grout from 14.6 m to 2.7 m								831.0
17	- backfilled with bentonite chips from 0.4 m to surface								
	-SDP-2A tip elevation at 843.4 m								
	-SDP-2B tip elevation at 842.7 m								
	-SDT-2 beads between 845.4 m and 834.4 m								



**EBA Engineering Consultants Ltd.**

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DRAWING NO:

COMPLETION DEPTH: 14.6m

COMPLETE: 1/31/2010

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Winter 2010 Instrumentation Program		Minto Explorations Ltd.		BOREHOLE NO: 10-SDT/P-3														
Southwest Waste Dump		Driftwood 3000 Diamond Drill-HQ Core		PROJECT NO: W14101068.005														
Minto Mine, YT		6944333.873N; 383824.672E; Zone 8		ELEVATION: 860.166m														
SAMPLE TYPE		<input checked="" type="checkbox"/> GRAB SAMPLE	<input type="checkbox"/> NO RECOVERY	<input checked="" type="checkbox"/> BULK	<input type="checkbox"/> CRREL CORE	<input type="checkbox"/> SHELBY TUBE	<input type="checkbox"/> GRAB CORE											
BACKFILL TYPE		<input type="checkbox"/> BENTONITE	<input type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input type="checkbox"/> SAND											
Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density (kg/m <sup>3</sup> )		CLAY (%)		SILT (%)		SAND (%)		GRAVEL (%)		Vibrating Wire	Vibrating Wire	Thermistor	Elevation (m)
					20	40	60	80	20	40	60	80	20	40				
0	WASTE ROCK FILL																	860.0
1																		859.0
2																		858.0
3																		857.0
4																		856.0
5	SAND AND SILT: well graded sand, blackish brown		G1	- Nbn														855.0
6																		854.0
7	SAND (TILL): gravelly, silty, trace of clay, well graded subangular sand, subrounded gravel, medium to dark grey		G2	- Vs, 2-3 mm thick ice lenses - Nbn														853.0
8																		852.0
9	- boulder		G3															851.0
10	- some cobbles		G4	- Nbn - Vs, 3-5 mm thick ice lenses														850.0
11	- some silt to silty			- Nbn														849.0
12			G5															848.0
13	- trace cobbles			- Vx, 5-10%														847.0
14																		846.0
15			G6															845.0
16	END OF BOREHOLE at 15.2 - backfilled with cement from 15.2 m to 4.9 m - backfilled with bentonite chips from 0.5 m to surface - SDP-3A tip elevation at 854.3 - SDP-3B tip elevation at 853.6 - SDT-3 beads between 858.4 m and 845.4 m		G7	- Vs, 5-10 mm thick ice lenses, spaced 300-400 mm														844.0
17																		



**EBA Engineering Consultants Ltd.**

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DRAWING NO:

COMPLETION DEPTH: 15.2m

COMPLETE: 1/28/2010

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Winter 2010 Instrumentation Program		Minto Explorations Ltd.		BOREHOLE NO: 10-SDT/P-4														
Southwest Waste Dump		Driftwood 3000 Diamond Drill-HQ Core		PROJECT NO: W14101068.005														
Minto Mine, YT		6944163.622N; 383783.542E; Zone 8		ELEVATION: 860.994m														
SAMPLE TYPE		<input checked="" type="checkbox"/> GRAB SAMPLE	<input type="checkbox"/> NO RECOVERY	<input checked="" type="checkbox"/> BULK	<input type="checkbox"/> CRREL CORE	<input type="checkbox"/> SHELBY TUBE	<input type="checkbox"/> GRAB CORE											
BACKFILL TYPE		<input type="checkbox"/> BENTONITE	<input type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input type="checkbox"/> SAND											
Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density (kg/m <sup>3</sup> )		CLAY (%)		SILT (%)		SAND (%)		GRAVEL (%)		Vibrating Wire	Vibrating Wire	Thermistor	Elevation (m)
					20	40	60	80	20	40	60	80	20	40				
0	WASTE ROCK FILL																	
1																		
2	ORGANICS: peat, abundant rootlets, very dark brown			- Nbe														
3	SAND: gravelly, trace silt, gravel < 30 mm subrounded, brown			- Nbn - Vr < 10%, 2-3 mm thick lenses														
4			G1															
5																		
6	- increasing gravel content, frequent cobbles < 150 mm, subangular		G2															
7																		
8	SAND (TILL): some gravel, trace silt, gravel < 20 mm subangular, dark greyish brown		G3															
9	- 100 mm cobble		G4															
10	- 150 mm cobble																	
11	- gravelly																	
12			G5															
13			G6															
14	END OF BOREHOLE at 13.1 m - backfilled with cement from 11.6 m to 1.5 m - SDP-4A tip elevation at 858.5 m - SDP-4B tip elevation at 862.4 m - SDT-4 beads between 860.6 m and 849.4 (one bead located above OG)																	
15																		



**EBA Engineering Consultants Ltd.**

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REVIEWED BY: JPB

DRAWING NO:

COMPLETION DEPTH: 13.1m

COMPLETE: 1/30/2010

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Water Conveyance Network		Minto Explorations Ltd.		BOREHOLE NO: 10-MCDS-01						
Minto Creek Detention Structure		Driftwood 3000 Diamond Drill-HQ Core		PROJECT NO: W14101068.013						
Minto Mine, YT		6945193.251N; 385882.288E; Zone 8		ELEVATION: 730.668m						
SAMPLE TYPE		<input checked="" type="checkbox"/> GRAB SAMPLE	<input type="checkbox"/> NO RECOVERY	<input checked="" type="checkbox"/> BULK	<input type="checkbox"/> CRREL CORE	<input type="checkbox"/> SHELBY TUBE	<input checked="" type="checkbox"/> GRAB CORE			
BACKFILL TYPE		<input checked="" type="checkbox"/> BENTONITE	<input checked="" type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input checked="" type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input checked="" type="checkbox"/> SAND			
Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density(kg/m <sup>3</sup> )		PLASTIC M.C. LIQUID		Monitoring well	Elevation (m)
					20	40	60	80		
0	ROCK FILL									730.0
1				- Nbe						729.0
2	PEAT - trace sand, fine fibrous, brown	<input checked="" type="checkbox"/>	G1							728.0
	SAND - some gravel, some silt, medium grained, brown - poor recovery from 2. 4 to 9.1 m		G2							727.0
	- only cobbles and coarse gravel recovered, fines washed away		G3	- Nbe - 5 mm thick ice lens, clear						726.0
3										725.0
4										724.0
5	- cobbles and gravel subangular to subrounded									723.0
6										722.0
7										721.0
8										720.0
9	BEDROCK - highly weathered, closely spaced joints, oxide stained joints									719.0
10										718.0
11	- becomes more competent, less staining									717.0
12	END OF BOREHOLE 11.6 m									716.0



**EBA Engineering Consultants Ltd.**

LOGGED BY: JGD

REVIEWED BY: JPB

DRAWING NO:

COMPLETION DEPTH: 11.6m

COMPLETE:

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Fall 2011 Geotechnical Drilling		CLIENT: Minto Explorations Ltd.			BOREHOLE NO: 11-G13								
Pelly Laydown		DRILL: Mini Sonic			PROJECT NO: W14101068.033								
Minto Mine, YT		6944734N; 383997.9E; Zone 8			ELEVATION: 859.9m								
SAMPLE TYPE		<input checked="" type="checkbox"/> DISTURBED	<input type="checkbox"/> NO RECOVERY	<input checked="" type="checkbox"/> SPT	<input type="checkbox"/> A-CASING	<input type="checkbox"/> SHELBY TUBE	<input type="checkbox"/> CORE						
BACKFILL TYPE		<input checked="" type="checkbox"/> BENTONITE	<input type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input type="checkbox"/> SAND						
Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	USC	SOIL SYMBOL	GROUND ICE DESCRIPTION AND COMMENTS	SPT (N)		PLASTIC M.C.		LIQUID		Elevation (m)
							20	40	60	80	20	40	
0	GRAVEL (WASTE ROCK FILL) - sandy, some silt, some cobbles, angular, well graded, <75 mm, loose, brown												859.0
1	- boulder		G1										
2	GRAVEL and SAND - trace silt, trace cobbles, sub-angular, well graded, <20 mm, damp, brown												858.0
3			G2										857.0
4	- boulders, sample washed to 6.1 m												856.0
5													855.0
6													854.0
7	- becomes silty, some cobbles, some sand, trace clay, sub-rounded, <30 mm, moist												853.0
8			G3										852.0
9	- becomes grey												851.0
10	SAND (FILL) - silty, some gravel, trace clay, fine to medium grained, moist, loose, brown												850.0
11			G4										849.0
12	- cobble, 200 mm thick												848.0
13	- becomes some silt												847.0
14													846.0
15													845.0
16	ORGANICS - root inclusions												844.0
17	SAND - some clay, some gravel, well graded, wet, loose, brown		G6										843.0
	SAND and SILT (TILL) - trace gravel, trace clay, well graded, firm, low plastic, brown, frozen		G7										
			G8										




LOGGED BY: KAE	COMPLETION DEPTH: 65.5m
REVIEWED BY: JGD	COMPLETE: 9/23/2011
DRAWING NO:	Page 1 of 4

Fall 2011 Geotechnical Drilling		CLIENT: Minto Explorations Ltd.		BOREHOLE NO: 11-G13											
Pelly Laydown		DRILL: Mini Sonic		PROJECT NO: W14101068.033											
Minto Mine, YT		6944734N; 383997.9E; Zone 8		ELEVATION: 859.9m											
SAMPLE TYPE		■ DISTURBED	□ NO RECOVERY	⊗ SPT	▨ A-CASING	▨ SHELBY TUBE	▨ CORE								
BACKFILL TYPE		■ BENTONITE	● PEA GRAVEL	▨ SLOUGH	○ GROUT	▨ DRILL CUTTINGS	● SAND								
Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	USC	SOIL SYMBOL	GROUND ICE DESCRIPTION AND COMMENTS	SALINITY (ppt)		CLAY (%)		SILT (%)		SAND (%)		Elevation (m)
							6	12	18	24	20	40	60	80	
							SPT (N)		PLASTIC M.C.		LIQUID				
							20	40	60	80	20	40	60	80	
							20		40		60		80		
17	- some gravel					- Vs, 10 mm thick by 10 mm spacing to 17.8 m, white, 50% ice content									
18			G9												842.0
19			G10			- ice lens 10 mm thick									841.0
20	CLAY (TILL) - silty, sandy, trace clay, trace gravel, low plastic, greyish brown, frozen														840.0
21			G11	CL	▨										839.0
22															838.0
23			G12			- ice lens 10 mm thick, white									837.0
24			G13												836.0
25			G14												835.0
25	- becomes some gravel		G15			- Vx/Vr/Vs 40% from 24.4 to 26.0 m									835.0
26			G16												834.0
27			G17			- ice lens 100 mm thick, white									833.0
27			G18			- Vx, 20%, to 27.4 m									833.0
28	- ICE and SILT (TILL), to 29.0 m														832.0
28			G19												832.0
29			G20												831.0
29	- becomes stiff, grey														831.0
30															830.0
30			G21	CL	▨	- ice lens 50 mm thick									830.0
31			G22			- Vs, 10 mm thick at 50 mm spacing to 30.5 m, 20% ice content									829.0
32						- ice lens 50 mm thick, clear									828.0
32															828.0
33	- ICE and CLAY (TILL) lenses, 45 mm thick at 800 mm spacing to 35.7 m														827.0
33			G23			- ice lenses 30 mm thick at 200 mm spacing to 32.6 m, clear,									827.0
34															826.0

Fall 2011 Geotechnical Drilling	CLIENT: Minto Explorations Ltd.	BOREHOLE NO: 11-G13
Pelly Laydown	DRILL: Mini Sonic	PROJECT NO: W14101068.033
Minto Mine, YT	6944734N; 383997.9E; Zone 8	ELEVATION: 859.9m

SAMPLE TYPE	<input type="checkbox"/> DISTURBED	<input type="checkbox"/> NO RECOVERY	<input type="checkbox"/> SPT	<input type="checkbox"/> A-CASING	<input type="checkbox"/> SHELBY TUBE	<input type="checkbox"/> CORE
BACKFILL TYPE	<input type="checkbox"/> BENTONITE	<input type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input type="checkbox"/> SAND


Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	USC	SOIL SYMBOL	GROUND ICE DESCRIPTION AND COMMENTS	SPT (N)		PLASTIC M.C. LIQUID		CLAY (%)		SILT (%)		SAND (%)		GRAVEL (%)		Elevation (m)
							20	40	60	80	20	40	60	80	20	40	60	80	
34			G24			ice content 15%													
35	- becomes gravelly		G25																
36	ICE and CLAY (TILL) lense - becomes very stiff		G27			- Vr/Vc, 5%, to 35.5 m													
37			G28																
38			G26			- ice lenses 25 mm thick at 400 mm spacing to 39.6 m, ice content 5%													
39	- ICE and CLAY (TILL), 100 mm thick		G29																
40			G30																
41	- ICE and CLAY (TILL), 100 mm thick		G31																
42			G32																
43			G33																
44	- becomes trace gravel		G34																
45	- ICE and CLAY (TILL), 100 mm thick		G35			- ice lens 100 mm thick, clear													
46						- ice lens 100 mm thick, white													
47																			
48	- sand seam, silty, trace gravel, well graded, wet, dark grey to 48.5 m		G36			- sample likely thawed due to drilling action, Nf													
49			G37																
50			G38			- ice lens 30 mm thick, clear													
51						- ice lenses 50 mm thick at 300 mm spacing													

	LOGGED BY: KAE	COMPLETION DEPTH: 65.5m
	REVIEWED BY: JGD	COMPLETE: 9/23/2011
	DRAWING NO:	Page 3 of 4

Fall 2011 Geotechnical Drilling	CLIENT: Minto Explorations Ltd.	BOREHOLE NO: 11-G13
Pelly Laydown	DRILL: Mini Sonic	PROJECT NO: W14101068.033
Minto Mine, YT	6944734N; 383997.9E; Zone 8	ELEVATION: 859.9m

SAMPLE TYPE	<input type="checkbox"/> DISTURBED	<input type="checkbox"/> NO RECOVERY	<input type="checkbox"/> SPT	<input type="checkbox"/> A-CASING	<input type="checkbox"/> SHELBY TUBE	<input type="checkbox"/> CORE
BACKFILL TYPE	<input type="checkbox"/> BENTONITE	<input type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input type="checkbox"/> SAND

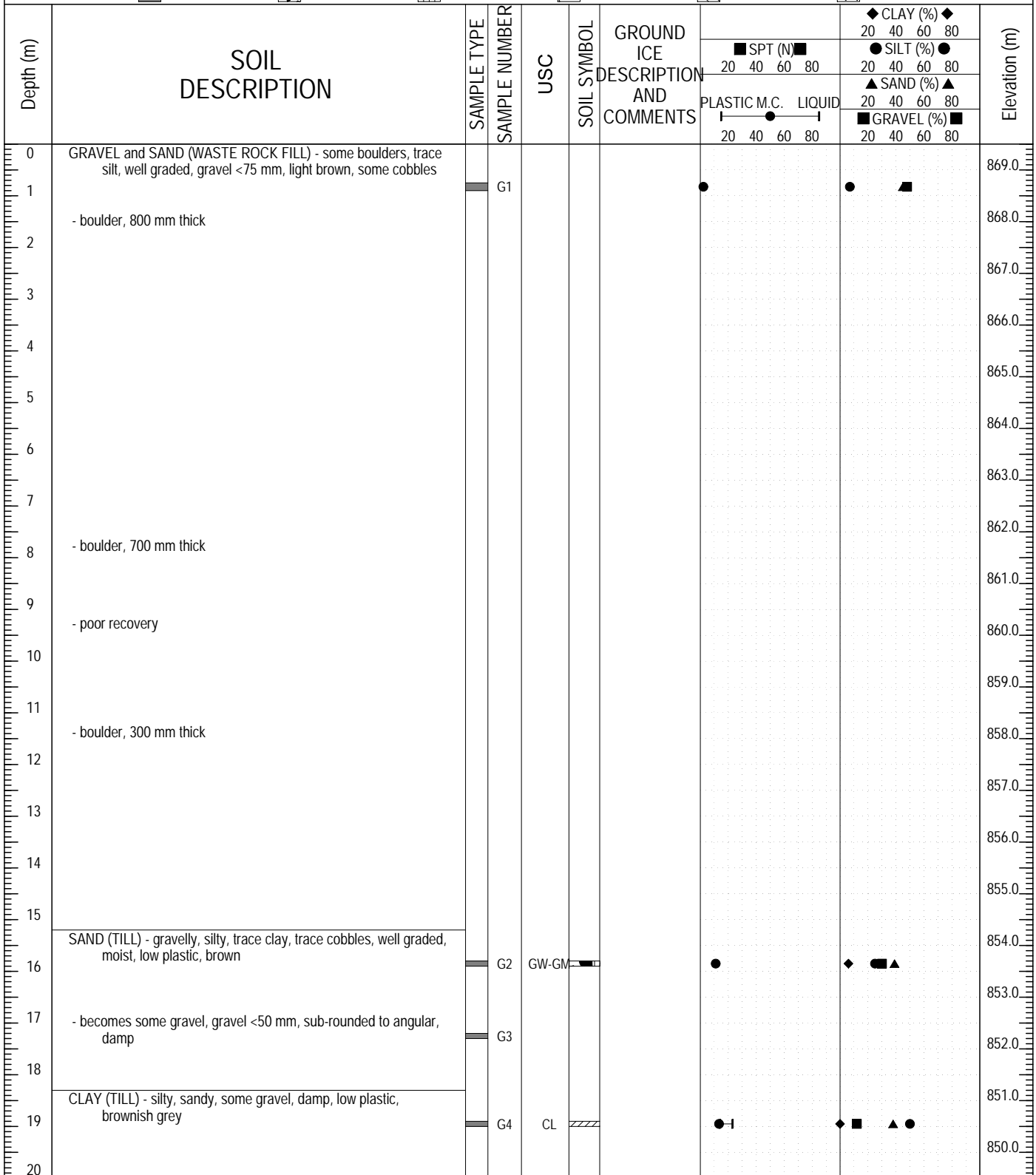
Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	USC	SOIL SYMBOL	GROUND ICE DESCRIPTION AND COMMENTS	SPT (N)		PLASTIC M.C.		LIQUID		CLAY (%)		SILT (%)		SAND (%)		GRAVEL (%)		Elevation (m)
							6	12	18	24	20	40	60	80	20	40	60	80	20	40	
51	- very stiff		G39																		
52	- becomes some sand, no gravel, dark grey - sand seam 20 mm thick		G40																		808.0
53			G42			- ice lens 10 mm thick, clear															807.0
54			G41			- Vs, 5 mm thick at 10 mm spacing tp 53.4 m; 35% ice content															806.0
55	- becomes sandy, some gravel, trace cobbles, stiff - becomes very stiff		G43			- ice lens 10 mm thick, clear															805.0
56			G44		CL	- sample likely thawed due to drilling action															804.0
57			G44			- ice lenses up to 200 mm thick at 300 mm spacing to 61.1 m, 35% ice content															803.0
58			G45																		802.0
59	SILT (TILL) - sandy, some clay, some gravel, very stiff, low to non-plastic, dark grey, frozen		G45																		801.0
60			G46																		800.0
61			G47																		799.0
62			G46																		798.0
63			G47																		797.0
64			G48																		796.0
65			G48																		795.0
66	END OF BOREHOLE @ 65.5 m (maximum depth of drill) NOTE: Modified USC Symbols shown where data available.																				794.0
67																					793.0
68																					792.0

	LOGGED BY: KAE	COMPLETION DEPTH: 65.5m
	REVIEWED BY: JGD	COMPLETE: 9/23/2011
	DRAWING NO:	Page 4 of 4



Fall 2011 Geotechnical Drilling	CLIENT: Minto Explorations Ltd.	BOREHOLE NO: 11-G14
Southwest Dump	DRILL: Mini Sonic	PROJECT NO: W14101068.033
Minto Mine, YT	6944414N; 383801E; Zone 8	ELEVATION: 869.5m

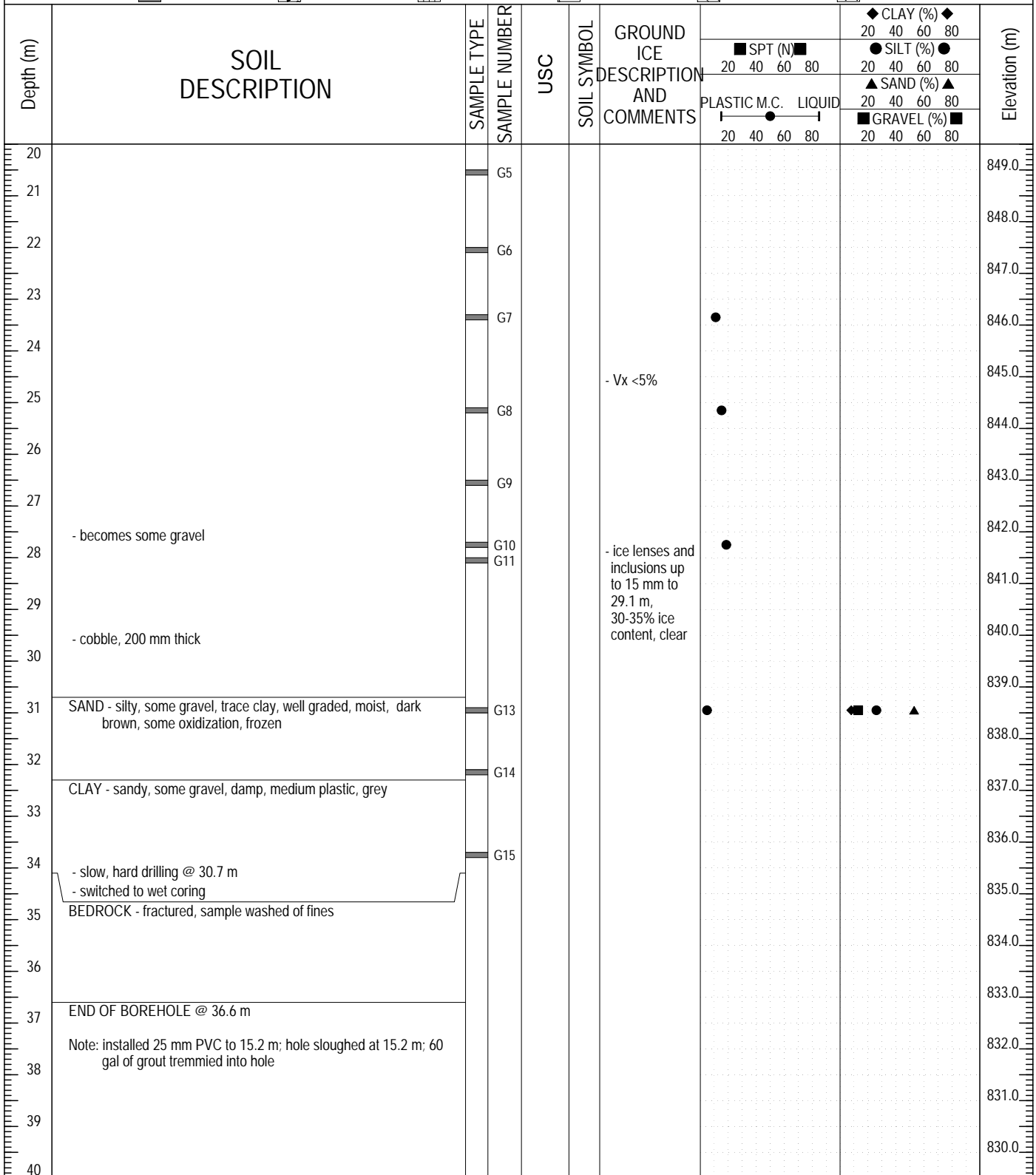
SAMPLE TYPE	DISTURBED	NO RECOVERY	SPT	A-CASING	SHELBY TUBE	CORE
BACKFILL TYPE	BENTONITE	PEA GRAVEL	SLOUGH	GROUT	DRILL CUTTINGS	SAND




 eba A TETRA TECH COMPANY	LOGGED BY: KAE	COMPLETION DEPTH: 36.6m
	REVIEWED BY: JGD	COMPLETE: 9/18/2011
	DRAWING NO:	Page 1 of 2

Fall 2011 Geotechnical Drilling	CLIENT: Minto Explorations Ltd.	BOREHOLE NO: 11-G14
Southwest Dump	DRILL: Mini Sonic	PROJECT NO: W14101068.033
Minto Mine, YT	6944414N; 383801E; Zone 8	ELEVATION: 869.5m

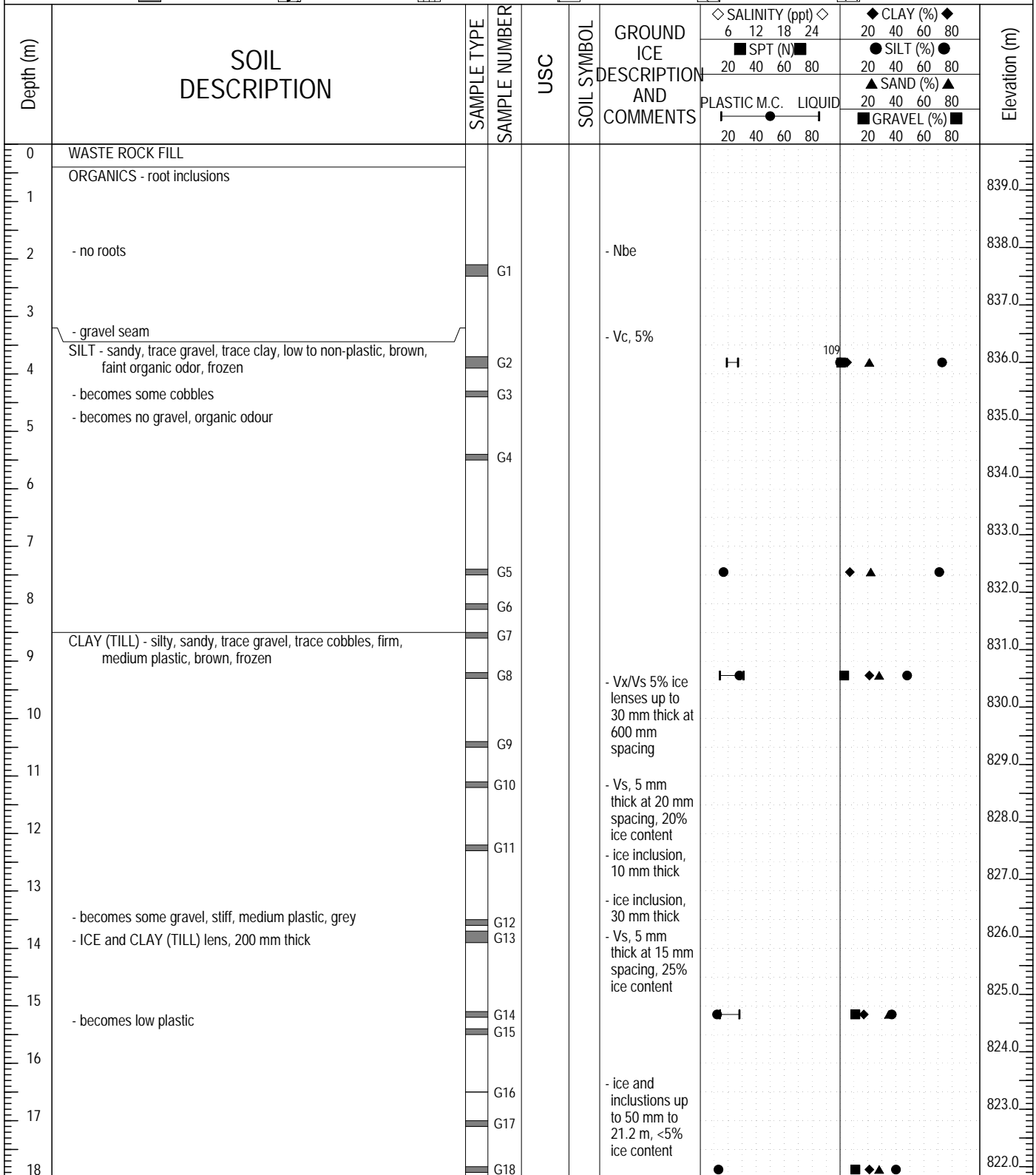
SAMPLE TYPE	<input type="checkbox"/> DISTURBED	<input type="checkbox"/> NO RECOVERY	<input type="checkbox"/> SPT	<input type="checkbox"/> A-CASING	<input type="checkbox"/> SHELBY TUBE	<input type="checkbox"/> CORE
BACKFILL TYPE	<input type="checkbox"/> BENTONITE	<input type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input type="checkbox"/> SAND



	LOGGED BY: KAE	COMPLETION DEPTH: 36.6m
	REVIEWED BY: JGD	COMPLETE: 9/18/2011
	DRAWING NO:	Page 2 of 2

Fall 2011 Geotechnical Drilling	CLIENT: Minto Explorations Ltd.	BOREHOLE NO: 11-G16
W15, Upper Minto Valley	DRILL: Mini Sonic	PROJECT NO: W14101068.033
Minto Mine, YT	6944633N; 384122.2E; Zone 8	ELEVATION: 839.8m

SAMPLE TYPE	DISTURBED	NO RECOVERY	SPT	A-CASING	SHELBY TUBE	CORE
BACKFILL TYPE	BENTONITE	PEA GRAVEL	SLOUGH	GROUT	DRILL CUTTINGS	SAND




 eba A TETRA TECH COMPANY	LOGGED BY: KAE	COMPLETION DEPTH: 65.5m
	REVIEWED BY: JGD	COMPLETE: 9/26/2011
	DRAWING NO:	Page 1 of 4

Fall 2011 Geotechnical Drilling	CLIENT: Minto Explorations Ltd.	BOREHOLE NO: 11-G16
W15, Upper Minto Valley	DRILL: Mini Sonic	PROJECT NO: W14101068.033
Minto Mine, YT	6944633N; 384122.2E; Zone 8	ELEVATION: 839.8m

SAMPLE TYPE	<input type="checkbox"/> DISTURBED	<input type="checkbox"/> NO RECOVERY	<input type="checkbox"/> SPT	<input type="checkbox"/> A-CASING	<input type="checkbox"/> SHELBY TUBE	<input type="checkbox"/> CORE
BACKFILL TYPE	<input type="checkbox"/> BENTONITE	<input type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input type="checkbox"/> SAND


Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	USC	SOIL SYMBOL	GROUND ICE DESCRIPTION AND COMMENTS	SALINITY (ppt)		CLAY (%)		SILT (%)		SAND (%)		GRAVEL (%)	Elevation (m)
							6	12	18	24	20	40	60	80		
18															821.0	
19			G19												820.0	
20	SAND and SILT (TILL) - some clay, trace gravel, well graded sand, stiff, non-plastic silt, brown, frozen		G20												819.0	
21			G21												818.0	
22	- varved		G22			- ice lens, cloudy									817.0	
23			G23												816.0	
24	- organic seam, 30 mm thick - becomes trace gravel, very stiff, low to medium plastic - ICE and SAND and SILT (TILL) lens, 100 mm thick		G24												815.0	
25	CLAY (TILL) - silty, sandy, trace gravel, very stiff, low to medium plastic, brown, frozen		G25			- Vx/Vs, 10%									814.0	
26			G26												813.0	
27			G27												812.0	
28			G28												811.0	
29	- sand seam, coarse		G29												810.0	
30			G30			- ice lens, 35 mm thick, clear									809.0	
31			G31												808.0	
32			G32			- ice inclusion, 40 mm thick, white - ice lenses up to 40 mm thick at 500 mm spacing, to 35.4 m, <10% ice content									807.0	
33			G33			- Vs, 4 mm thick at 25 mm spacing, 100 mm thick, 15% ice									806.0	
34															805.0	
35	SILT - sandy, some clay, trace gravel, very stiff, low to medium plastic, brown, frozen														804.0	
36															804.0	

	LOGGED BY: KAE	COMPLETION DEPTH: 65.5m
	REVIEWED BY: JGD	COMPLETE: 9/26/2011
	DRAWING NO:	Page 2 of 4

Fall 2011 Geotechnical Drilling	CLIENT: Minto Explorations Ltd.	BOREHOLE NO: 11-G16
W15, Upper Minto Valley	DRILL: Mini Sonic	PROJECT NO: W14101068.033
Minto Mine, YT	6944633N; 384122.2E; Zone 8	ELEVATION: 839.8m

SAMPLE TYPE	<input type="checkbox"/> DISTURBED	<input type="checkbox"/> NO RECOVERY	<input type="checkbox"/> SPT	<input type="checkbox"/> A-CASING	<input type="checkbox"/> SHELBY TUBE	<input type="checkbox"/> CORE
BACKFILL TYPE	<input type="checkbox"/> BENTONITE	<input type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input type="checkbox"/> SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	USC	SOIL SYMBOL	GROUND ICE DESCRIPTION AND COMMENTS	SPT (N)		PLASTIC M.C. LIQUID		CLAY (%)		SILT (%)		SAND (%)		GRAVEL (%)		Elevation (m)
							6	12	18	24	20	40	60	80	20	40	60	80	
36			G34			content, Nbn following													803.0
37	- clay seam, silty, some sand, soft, high plastic, brown, 100 mm thick		G35																802.0
38	- clay seam, silty, some sand, soft, high plastic, brown, 100 mm thick		G36																801.0
39	- becomes dark grey		G37																800.0
40	- boulder		G38																799.0
41	- clay seam, silty, some sand, soft, high plastic, brown		G39																798.0
42	- cobble		G40																797.0
43	- becomes some cobbles, some oxidization staining		G41																796.0
44	- becomes trace cobbles, low to non-plastic, dark grey		G42																795.0
45			G43																794.0
46			G44																793.0
47	- becomes sandy, gravelly																		792.0
48																			791.0
49																			790.0
50																			789.0
51																			788.0
52	- becomes some sand, some clay					- Nbe													787.0
53	- sandy seams, 30 mm thick at 400 mm spacing to 59.4 m		G45																786.0

	LOGGED BY: KAE	COMPLETION DEPTH: 65.5m
	REVIEWED BY: JGD	COMPLETE: 9/26/2011
	DRAWING NO:	Page 3 of 4

Fall 2011 Geotechnical Drilling	CLIENT: Minto Explorations Ltd.	BOREHOLE NO: 11-G16
W15, Upper Minto Valley	DRILL: Mini Sonic	PROJECT NO: W14101068.033
Minto Mine, YT	6944633N; 384122.2E; Zone 8	ELEVATION: 839.8m

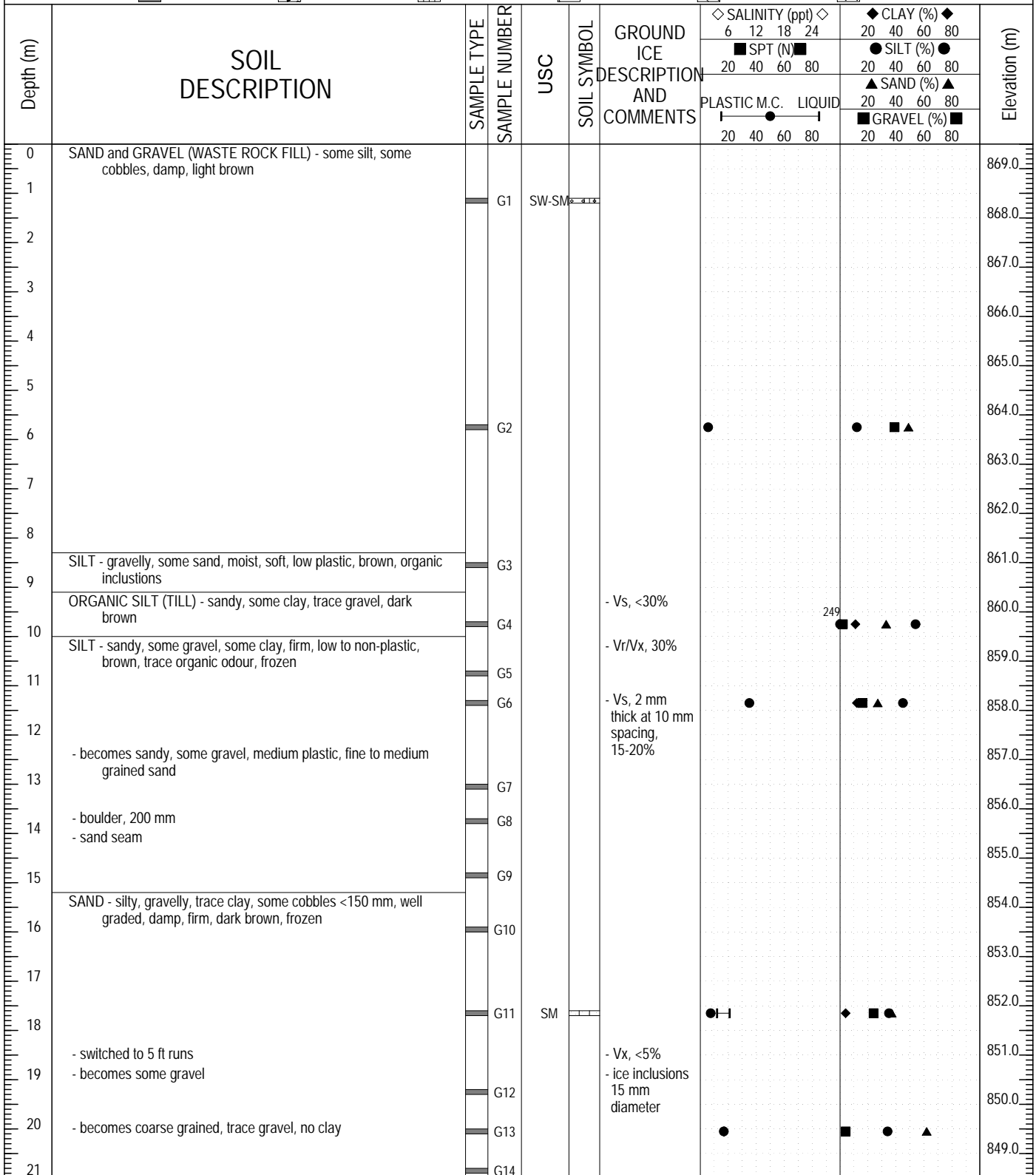
SAMPLE TYPE	DISTURBED	NO RECOVERY	SPT	A-CASING	SHELBY TUBE	CORE
BACKFILL TYPE	BENTONITE	PEA GRAVEL	SLOUGH	GROUT	DRILL CUTTINGS	SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	USC	SOIL SYMBOL	GROUND ICE DESCRIPTION AND COMMENTS	SALINITY (ppt)		CLAY (%)		SILT (%)		SAND (%)		Elevation (m)
							6	12	18	24	20	40	60	80	
54			G46											785.0	
55						- Nbn								784.0	
56	- becomes trace gravel		G47											783.0	
57														782.0	
58	- becomes brown													781.0	
59			G48											780.0	
60	- becomes stiff, dark grey		G49											780.0	
61	CLAY (TILL) - some silt, trace sand, trace gravel, firm, high plastic, brown, frozen		G50											779.0	
62			G51											778.0	
63	SILT (TILL) - sandy, some clay, trace gravel, stiff, low to medium plastic, dark grey, frozen		G52											777.0	
64														776.0	
65	- becomes some sand, trace clay, low plastic, very stiff		G53	CL-ML										775.0	
66	END OF BOREHOLE @ 65.5 m (maximum depth of drill)													774.0	
67	NOTE: Modified USC Symbols shown where data available													773.0	
68														772.0	
69														771.0	
70														770.0	
71														769.0	
72														768.0	

 A TETRA TECH COMPANY	LOGGED BY: KAE	COMPLETION DEPTH: 65.5m
	REVIEWED BY: JGD	COMPLETE: 9/26/2011
	DRAWING NO:	Page 4 of 4

Fall 2011 Geotechnical Drilling	CLIENT: Minto Explorations Ltd.	BOREHOLE NO: 11-G15
Southwest Dump	DRILL: Mini Sonic	PROJECT NO: W14101068.033
Minto Mine, YT	6944235N; 383762.8E; Zone 8	ELEVATION: 869.5m

SAMPLE TYPE	DISTURBED	NO RECOVERY	SPT	A-CASING	SHELBY TUBE	CORE
BACKFILL TYPE	BENTONITE	PEA GRAVEL	SLOUGH	GROUT	DRILL CUTTINGS	SAND



 A TETRA TECH COMPANY	LOGGED BY: KAE	COMPLETION DEPTH: 57.9m
	REVIEWED BY: JGD	COMPLETE: 9/19/2011
	DRAWING NO:	Page 1 of 3

Fall 2011 Geotechnical Drilling	CLIENT: Minto Explorations Ltd.	BOREHOLE NO: 11-G15
Southwest Dump	DRILL: Mini Sonic	PROJECT NO: W14101068.033
Minto Mine, YT	6944235N; 383762.8E; Zone 8	ELEVATION: 869.5m

SAMPLE TYPE	DISTURBED	NO RECOVERY	SPT	A-CASING	SHELBY TUBE	CORE
BACKFILL TYPE	BENTONITE	PEA GRAVEL	SLOUGH	GROUT	DRILL CUTTINGS	SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	USC	SOIL SYMBOL	GROUND ICE DESCRIPTION AND COMMENTS	SPT (N)		PLASTIC M.C.		LIQUID		CLAY (%)		SILT (%)		SAND (%)		GRAVEL (%)		Elevation (m)
							20	40	60	80	20	40	60	80	20	40	60	80	20	40	
21	- clay seam, high plastic, 15 mm																				848.0
22			G15																		847.0
23			G16																		846.0
24						- Vx, 10%															845.0
25			G17			- ice inclusion 50 mm diameter															844.0
26	- ICE and SILT, 200 mm thick		G18			- ice lens															843.0
27			G19			- Vx, 50%															842.0
28	- ICE and SILT, 100 mm thick		G20																		841.0
29	- ICE and SILT, 100 mm thick																				840.0
30	SILT and SAND - trace gravel, firm, dark brown		G21	SC		- Vs, 3 mm thick at 30 mm spacing, 10% ice content															839.0
31			G22			- ice lens, clear															838.0
32	- sand seam		G23			- Vx, 20%															837.0
33	- becomes some gravel		G24																		836.0
34	- ICE and SAND, 50 mm thick		G25																		835.0
35	- ICE and SAND					- Vx, 5%															834.0
36	- ICE and SAND		G26																		833.0
37	- becomes stiff, begin lifting sample at signs of resistance in order to preserve permafrost samples		G27			- ice lens 50 mm thick															832.0
38	- ICE and SAND, 50 mm thick		G28			- ice lens 50 mm thick															831.0
39	- becomes trace gravel, trace clay																				830.0
40	- ICE and SAND, 50 mm thick		G29			- ice lens 15 mm thick, clear															829.0
41			G30																		828.0
42	SILT (TILL) - some gravel, trace sand, stiff, low plastic, dark grey, frozen		G31			- ice lens 50 mm thick															828.0

 A TETRA TECH COMPANY	LOGGED BY: KAE	COMPLETION DEPTH: 57.9m
	REVIEWED BY: JGD	COMPLETE: 9/19/2011
	DRAWING NO:	Page 2 of 3



Fall 2011 Geotechnical Drilling	CLIENT: Minto Explorations Ltd.	BOREHOLE NO: 11-G18
W15, Upper Minto Valley	DRILL: Mini Sonic	PROJECT NO: W14101068.033
Minto Mine, YT	6944482N; 384008.9E; Zone 8	ELEVATION: 848.8m

SAMPLE TYPE	DISTURBED	NO RECOVERY	SPT	A-CASING	SHELBY TUBE	CORE
BACKFILL TYPE	BENTONITE	PEA GRAVEL	SLOUGH	GROUT	DRILL CUTTINGS	SAND


Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	USC	SOIL SYMBOL	GROUND ICE DESCRIPTION AND COMMENTS	SPT (N)		PLASTIC M.C. LIQUID		CLAY (%)		SILT (%)		SAND (%)		GRAVEL (%)		Elevation (m)
							6	12	18	24	20	40	60	80	20	40	60	80	
0	GRAVEL WASTE ROCK FILL) - sandy, trace silt, well graded, sub-rounded, dry, loose, grey																		848.0
1																			
2	- root inclusions - boulder 600 mm diameter		G1	GW															847.0
3	ORGANICS - wood and root inclusions, frozen		G2			- Nbe													846.0
4	SILT - some sand, trace clay, stiff, low plastic, dark grey, organic odor, frozen		G3			- Vs, 1 mm thick at 10 mm spacing, 10% to 4.7 m													845.0
5																			844.0
6			G4																843.0
7	SAND - silty, some gravel, trace clay, well graded, moist, soft, low plastic, tan, frozen		G5	SM		- sample likely frozen but thawed by drill action													842.0
8	- becomes some gravel - becomes sandy, some silt, low to medium plastic		G6																841.0
9																			840.0
10	CLAY (TILL) - silty, sandy, trace gravel, firm, low to non-plastic, dark grey, frozen		G7	CL															839.0
11	- becomes some sand, some silt, trace gravel, stiff, medium plastic					- sample likely frozen but thawed by drill action													838.0
12			G8																837.0
13			G9																836.0
14						- ice lens 40 mm thick, clear													835.0
15			G10			- Vx/Vs, 10% to 14.5 m - ice inclusions, 40 mm thick, white													834.0
16						- ice lens 5 mm thick, white													833.0
17	- ICE and CLAY (TILL), 100 mm thick		G11			- ice lens 50 mm thick,													832.0

 A TETRA TECH COMPANY	LOGGED BY: KAE	COMPLETION DEPTH: 65.5m
	REVIEWED BY: JGD	COMPLETE: 10/1/2011
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Fall 2011 Geotechnical Drilling	CLIENT: Minto Explorations Ltd.	BOREHOLE NO: 11-G18
W15, Upper Minto Valley	DRILL: Mini Sonic	PROJECT NO: W14101068.033
Minto Mine, YT	6944482N; 384008.9E; Zone 8	ELEVATION: 848.8m

SAMPLE TYPE	<input type="checkbox"/> DISTURBED	<input type="checkbox"/> NO RECOVERY	<input type="checkbox"/> SPT	<input type="checkbox"/> A-CASING	<input type="checkbox"/> SHELBY TUBE	<input type="checkbox"/> CORE
BACKFILL TYPE	<input type="checkbox"/> BENTONITE	<input type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input type="checkbox"/> SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	USC	SOIL SYMBOL	GROUND ICE DESCRIPTION AND COMMENTS	SPT (N)		PLASTIC M.C. LIQUID		CLAY (%)		SILT (%)		SAND (%)		GRAVEL (%)		Elevation (m)
							20	40	20	40	20	40	20	40	20	40	20	40	
17						clear													831.0
18			G12			- Vx, 30% to 17.7 m													830.0
19						- ice lens 40 mm thick, clear													829.0
20			G13			- Vx, 5% to 19.0 m													828.0
21	- ICE and CLAY (TILL), 100 mm thick - becomes some gravel		G14			- ice lenses 50 mm thick at 500 mm spacing, 10% ice content													827.0
22																			826.0
23																			825.0
24			G16																824.0
25			G15																823.0
26	- becomes trace gravel, medium to high plastic		G17																822.0
27	- ICE and CLAY (TILL), 200 mm thick																		821.0
28			G18																820.0
29																			819.0
30			G19																818.0
31	- becomes low plastic		G20																817.0
32	- ICE and CLAY (TILL), 100 mm thick																		816.0
33	- ICE and CLAY (TILL), 500 mm thick		G21																815.0
34			G22			- ice lens 30 mm thick, white													815.0

	LOGGED BY: KAE	COMPLETION DEPTH: 65.5m
	REVIEWED BY: JGD	COMPLETE: 10/1/2011
	DRAWING NO:	Page 2 of 4

Fall 2011 Geotechnical Drilling		CLIENT: Minto Explorations Ltd.		BOREHOLE NO: 11-G18									
W15, Upper Minto Valley		DRILL: Mini Sonic		PROJECT NO: W14101068.033									
Minto Mine, YT		6944482N; 384008.9E; Zone 8		ELEVATION: 848.8m									
SAMPLE TYPE		<input type="checkbox"/> DISTURBED <input type="checkbox"/> NO RECOVERY <input checked="" type="checkbox"/> SPT <input type="checkbox"/> A-CASING <input type="checkbox"/> SHELBY TUBE <input type="checkbox"/> CORE											
BACKFILL TYPE		<input type="checkbox"/> BENTONITE <input type="checkbox"/> PEA GRAVEL <input type="checkbox"/> SLOUGH <input type="checkbox"/> GROUT <input type="checkbox"/> DRILL CUTTINGS <input type="checkbox"/> SAND											
Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	USC	SOIL SYMBOL	GROUND ICE DESCRIPTION AND COMMENTS	SPT (N)		PLASTIC M.C. LIQUID		CLAY (%)		Elevation (m)
							20	40	60	80	20	40	
34			G23									814.0	
35						- ice lenses 20 mm thick at 500 mm spacing, clear to 37.7 m						813.0	
36												812.0	
37												811.0	
38	- becomes silty, sandy		G24				1					810.0	
39	- ICE and CLAY (TILL), 70 mm thick											810.0	
40	- becomes medium plastic		G25			- ice inclusion 20 mm diameter						809.0	
41	- cobble, 80 mm diameter		G26									808.0	
42												807.0	
43	- becomes very stiff		G27									806.0	
44			G28									805.0	
45			G29									804.0	
46	- clay seam, high plastic					- Nbe						803.0	
47	- sand seam, 50 mm thick, coarse		G30									802.0	
48	- becomes sandy, organic odor											801.0	
49	SAND - some gravel, some clay, trace silt, coarse, loose, grey, frozen		G31			- Nf						800.0	
50	CLAY (TILL) - silty, some sand, trace gravel, stiff, medium plastic, grey, frozen		G32	CI								799.0	
51	- ICE and CLAY (TILL), 300 mm thick		G33									798.0	
	- varved clay, grey and olive brown, medium to high plastic		G34									798.0	



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DRAWING NO:

COMPLETION DEPTH: 65.5m

COMPLETE: 10/1/2011

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Fall 2011 Geotechnical Drilling	CLIENT: Minto Explorations Ltd.	BOREHOLE NO: 11-G18
W15, Upper Minto Valley	DRILL: Mini Sonic	PROJECT NO: W14101068.033
Minto Mine, YT	6944482N; 384008.9E; Zone 8	ELEVATION: 848.8m

SAMPLE TYPE	DISTURBED	NO RECOVERY	SPT	A-CASING	SHELBY TUBE	CORE
BACKFILL TYPE	BENTONITE	PEA GRAVEL	SLOUGH	GROUT	DRILL CUTTINGS	SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	USC	SOIL SYMBOL	GROUND ICE DESCRIPTION AND COMMENTS	SPT (N)		PLASTIC M.C.		LIQUID		CLAY (%)		SILT (%)		SAND (%)		GRAVEL (%)		Elevation (m)
							6	12	18	24	20	40	60	80	20	40	60	80	20	40	
51	- becomes some gravel		G35																		797.0
52			G36																		796.0
53			G37			- sample likely frozen but thawed by drill action, likely Nbn															795.0
54																					794.0
55	SILT (TILL) - some sand, trace clay, trace gravel, damp, stiff, low to medium plastic, grey, likely frozen		G38			- sample likely frozen but thawed by drill action, likely Nbn															793.0
56																					792.0
57	CLAY (TILL) - silty, trace gravel, trace sand, damp, stiff, medium plastic, grey, frozen		G39	Cl		- sample likely frozen but thawed by drill action, likely Nbn															791.0
58																					790.0
59			G40																		789.0
60			G41																		788.0
61	SILT - sandy, firm, non plastic, dark grey, likely frozen		G42																		787.0
62			G43																		786.0
63	- becomes soft, organic odor																				785.0
64																					784.0
65			G44																		783.0
66	END OF BOREHOLE @ 65.5 m (maximum depth of drill)																				782.0
67	NOTE: Modified USC Symbols shown where data available																				781.0
68																					

 A TETRA TECH COMPANY	LOGGED BY: KAE	COMPLETION DEPTH: 65.5m
	REVIEWED BY: JGD	COMPLETE: 10/1/2011
	DRAWING NO:	Page 4 of 4

Fall 2011 Geotechnical Drilling	CLIENT: Minto Explorations Ltd.	BOREHOLE NO: 11-G19
Pelly Laydown	DRILL: Mini Sonic	PROJECT NO: W14101068.033
Minto Mine, YT	6944875N; 383826E; Zone 8	ELEVATION: 862.3m

SAMPLE TYPE	DISTURBED	NO RECOVERY	SPT	A-CASING	SHELBY TUBE	CORE
BACKFILL TYPE	BENTONITE	PEA GRAVEL	SLOUGH	GROUT	DRILL CUTTINGS	SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	USC	SOIL SYMBOL	GROUND ICE DESCRIPTION AND COMMENTS	SPT (N)		PLASTIC M.C.		LIQUID		CLAY (%)		SILT (%)		SAND (%)		GRAVEL (%)		Elevation (m)
							6	12	18	24	20	40	60	80	20	40	60	80	20	40	
0	SAND (RESIDUUM FILL) - some gravel, some silt, trace cobbles, well graded, firm, reddish brown		G1																		862.0
1																					861.0
2																					860.0
3																					859.0
4																					858.0
5	ORGANICS - root inclusions																				857.0
5	SILT and SAND - some gravel, trace clay, wet, soft, low plastic, light brown		G2	SC																	857.0
6																					856.0
7	- becomes frozen		G3			- Nbn															855.0
8																					854.0
9	- ICE with SILT and SAND, 300 mm thick		G4																		853.0
10			G5			- Vx, 5% to 10.3 m															852.0
11	- becomes firm																				851.0
12	SILT (TILL) - sandy, some clay, trace gravel, very stiff, low to non-plastic, grey, frozen		G6																		850.0
13	- becomes firm, brown		G7			- ice inclusion, 20 mm thick															849.0
14	- sand seam, coarse, 200 mm thick		G8																		848.0
15																					847.0
16	- ICE and SILT, 30 mm thick																				846.0
16	- sand seam, coarse, 200 mm thick		G9																		846.0
16	- becomes some gravel																				845.0
17	- gravel seam, coarse, 500 mm thick		G10																		845.0
18			G11																		844.0
19			G12																		843.0
20						- ice lens, 30 mm thick															843.0
20	SAND - silty, some gravel, trace clay, stiff, coarse, stiff, grey, frozen		G13																		842.0
21			G14																		842.0
22			G15																		841.0
22	- ICE and SAND lens, 20 mm thick																				840.0
23	SAND - silty, some gravel, trace clay, stiff, well graded, grey,		G16																		840.0

 A TETRA TECH COMPANY	LOGGED BY: KAE	COMPLETION DEPTH: 65.5m
	REVIEWED BY: JGD	COMPLETE: 9/24/2011
	DRAWING NO:	Page 1 of 3

Fall 2011 Geotechnical Drilling	CLIENT: Minto Explorations Ltd.	BOREHOLE NO: 11-G19
Pelly Laydown	DRILL: Mini Sonic	PROJECT NO: W14101068.033
Minto Mine, YT	6944875N; 383826E; Zone 8	ELEVATION: 862.3m

SAMPLE TYPE	DISTURBED	NO RECOVERY	SPT	A-CASING	SHELBY TUBE	CORE
BACKFILL TYPE	BENTONITE	PEA GRAVEL	SLOUGH	GROUT	DRILL CUTTINGS	SAND

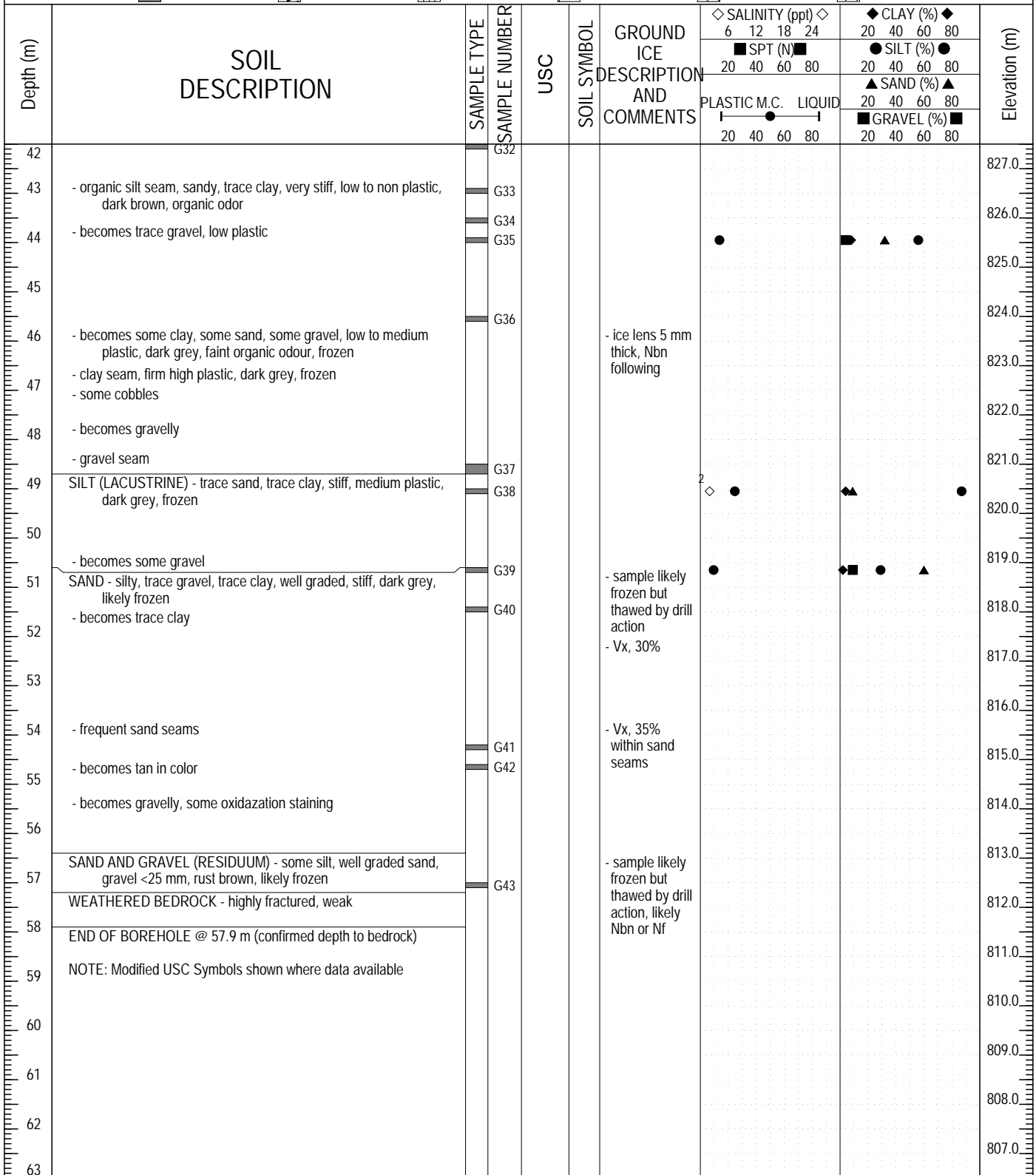
Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	USC	SOIL SYMBOL	GROUND ICE DESCRIPTION AND COMMENTS	SPT (N)		PLASTIC M.C. LIQUID		CLAY (%)		SILT (%)		SAND (%)		GRAVEL (%)		Elevation (m)
							6	12	18	24	20	40	60	80	20	40	60	80	
23	frozen																		839.0
24	- becomes very stiff, trace cobbles		G17	SC		- ice lens, 10 mm thick													838.0
25			G18																837.0
26			G19																836.0
27	- ICE and SILT lens, 20 mm thick		G20																835.0
28	CLAY (TILL) - silty, some gravel, trace sand, firm, plastic, grey, frozen																		834.0
29	- becomes trace gravel		G21			- ice inclusions, 10 mm thick by 300 mm spacing to 29.0 m, Vs, Vx <5%													833.0
30	SILT (TILL) - sandy, some gravel, trace clay, very stiff, low to non-plastic, dark grey, frozen		G22																832.0
31	CLAY (TILL) - silty, some gravel, trace sand, firm, plastic, grey, frozen		G23																831.0
32																			830.0
33	- silt (till) seam, 200 mm thick		G24																829.0
34																			828.0
35			G25																827.0
36			G26																826.0
37	SILT and SAND (TILL) - trace clay, trace gravel, very stiff, low to non-plastic, dark grey, frozen		G27	SC		- ice inclusion, 30 mm thick, clear													825.0
38	- ICE and SILT inclusion, 50 mm thick		G28																824.0
39			G30																823.0
40			G29			- ice lens, 120 mm thick, clear													822.0
41	CLAY (TILL) - silty, trace sand, trace gravel, firm, low to medium plastic, frozen		G31			- ice lens, 3 mm thick, clear													821.0
42	- becomes low to medium plastic		G32			- ice inclusion, 40 mm thick, clear													820.0
43	- becomes stiff		G33																819.0
44			G34																818.0
45	SILT (TILL) - sandy, some gravel, trace clay, very stiff, low to non-plastic, dark grey, frozen		G35			- Nbn													817.0
46	CLAY (TILL) - silty, some sand, trace gravel, stiff, low to medium plastic, dark grey, frozen		G36 G37																

 A TETRA TECH COMPANY	LOGGED BY: KAE	COMPLETION DEPTH: 65.5m
	REVIEWED BY: JGD	COMPLETE: 9/24/2011
	DRAWING NO:	Page 2 of 3

Fall 2011 Geotechnical Drilling		CLIENT: Minto Explorations Ltd.		BOREHOLE NO: 11-G19											
Pelly Laydown		DRILL: Mini Sonic		PROJECT NO: W14101068.033											
Minto Mine, YT		6944875N; 383826E; Zone 8		ELEVATION: 862.3m											
SAMPLE TYPE		<input type="checkbox"/> DISTURBED <input type="checkbox"/> NO RECOVERY <input type="checkbox"/> SPT <input type="checkbox"/> A-CASING <input type="checkbox"/> SHELBY TUBE <input type="checkbox"/> CORE													
BACKFILL TYPE		<input type="checkbox"/> BENTONITE <input type="checkbox"/> PEA GRAVEL <input type="checkbox"/> SLOUGH <input type="checkbox"/> GROUT <input type="checkbox"/> DRILL CUTTINGS <input type="checkbox"/> SAND													
Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	USC	SOIL SYMBOL	GROUND ICE DESCRIPTION AND COMMENTS	SALINITY (ppt)		CLAY (%)		SILT (%)		SAND (%)		Elevation (m)
							6	12	18	24	20	40	60	80	
							SPT (N) 20 40 60 80		PLASTIC M.C. LIQUID 20 40 60 80		GRAVEL (%) 20 40 60 80				
46														816.0	
47	- becomes sandy		G38											815.0	
48	- sand seam, coarse		G39											814.0	
49	- clay seam, trace sand, high plastic		G40											813.0	
50	- sand seam, coarse													812.0	
51	- boulder		G41											811.0	
52	SILT (TILL) - sandy, some gravel, trace clay, very stiff, medium plastic, dark grey, frozen													810.0	
53														809.0	
54			G42											808.0	
55														807.0	
56														806.0	
57														805.0	
58	- becomes trace gravel		G43											804.0	
59	- becomes some gravel													803.0	
60	- becomes gravelly													802.0	
61	- becomes trace cobbles		G44											801.0	
62	CLAY (TILL) - some sand, some silt, trace gravel, stiff, medium to high plastic, brown, frozen		G45											800.0	
63	SILT (TILL) - sandy, some gravel, trace clay, very stiff, low to medium plastic, dark grey, some oxidization staining, frozen		G46											799.0	
64	SAND - some clay, trace gravel, well graded, moist, loose, brown to reddish brown, frozen													798.0	
65	- becomes silty, trace clay		G47											797.0	
66	END OF BOREHOLE @ 65.5 m (maximum depth of drill)													796.0	
67	NOTE: Modified USC Symbols shown where data available													795.0	
68														794.0	
69														793.0	

Fall 2011 Geotechnical Drilling	CLIENT: Minto Explorations Ltd.	BOREHOLE NO: 11-G15
Southwest Dump	DRILL: Mini Sonic	PROJECT NO: W14101068.033
Minto Mine, YT	6944235N; 383762.8E; Zone 8	ELEVATION: 869.5m

SAMPLE TYPE	DISTURBED	NO RECOVERY	SPT	A-CASING	SHELBY TUBE	CORE
BACKFILL TYPE	BENTONITE	PEA GRAVEL	SLOUGH	GROUT	DRILL CUTTINGS	SAND

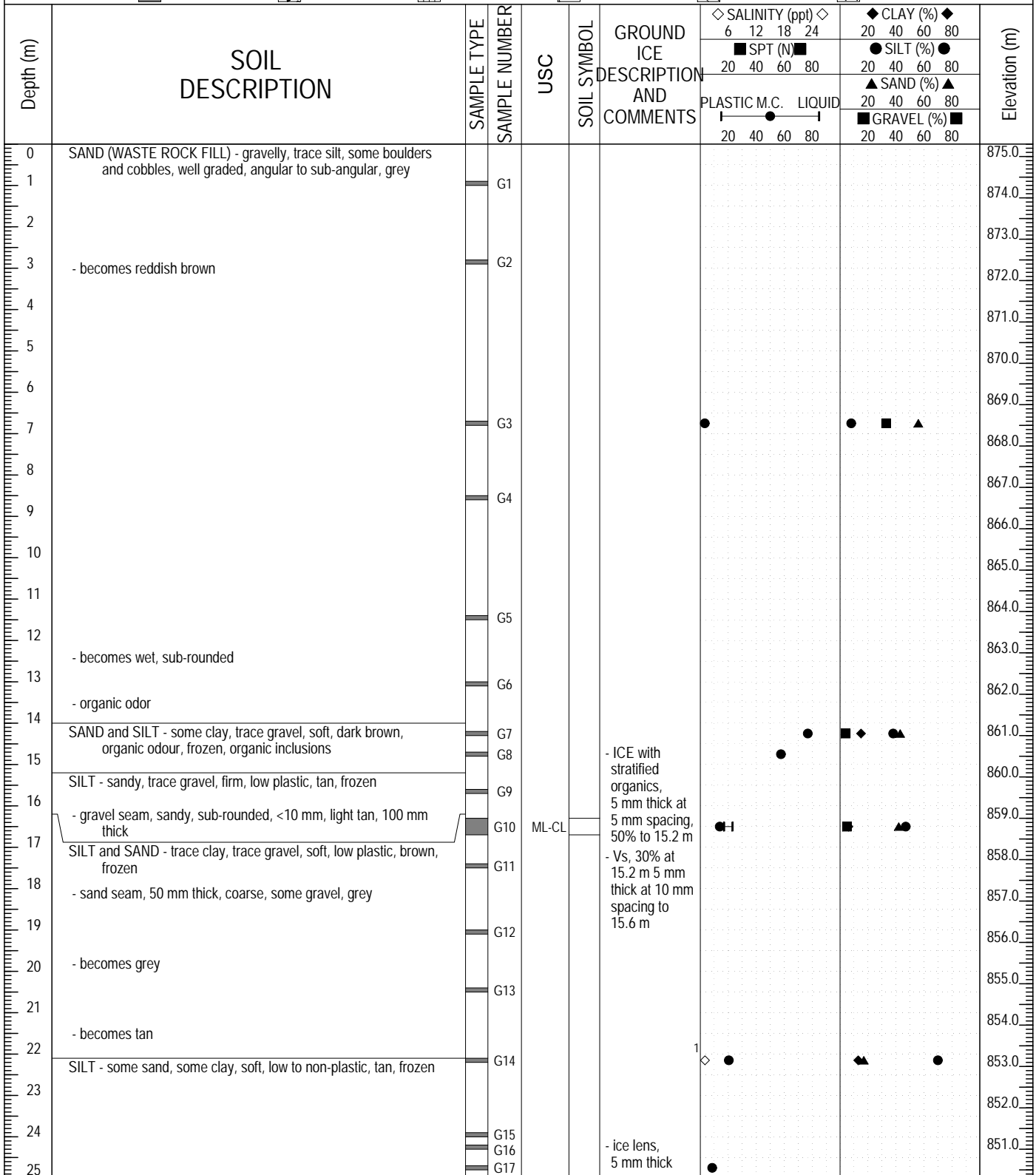


 A TETRA TECH COMPANY	LOGGED BY: KAE	COMPLETION DEPTH: 57.9m
	REVIEWED BY: JGD	COMPLETE: 9/19/2011
	DRAWING NO:	Page 3 of 3



Fall 2011 Geotechnical Drilling	CLIENT: Minto Explorations Ltd.	BOREHOLE NO: 11-G20
Southwest Dump	DRILL: Mini Sonic	PROJECT NO: W14101068.033
Minto Mine, YT	6944312N; 383721.7E; Zone 8	ELEVATION: 875.3m

SAMPLE TYPE	DISTURBED	NO RECOVERY	SPT	A-CASING	SHELBY TUBE	CORE
BACKFILL TYPE	BENTONITE	PEA GRAVEL	SLOUGH	GROUT	DRILL CUTTINGS	SAND




 A TETRA TECH COMPANY	LOGGED BY: KAE	COMPLETION DEPTH: 45.7m
	REVIEWED BY: JGD	COMPLETE: 9/28/2011
	DRAWING NO:	Page 1 of 2

Fall 2011 Geotechnical Drilling	CLIENT: Minto Explorations Ltd.	BOREHOLE NO: 11-G20
Southwest Dump	DRILL: Mini Sonic	PROJECT NO: W14101068.033
Minto Mine, YT	6944312N; 383721.7E; Zone 8	ELEVATION: 875.3m

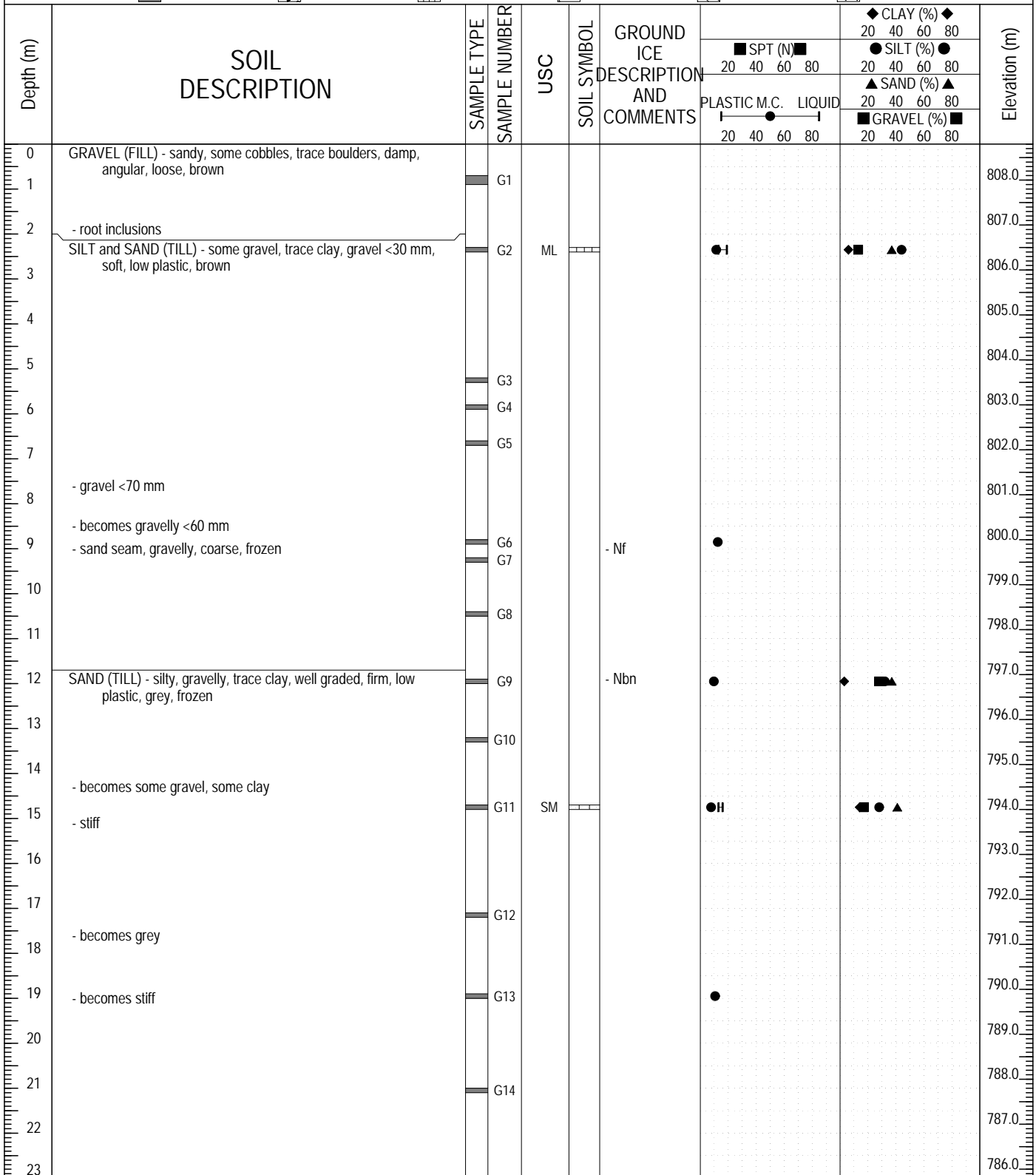
SAMPLE TYPE	<input type="checkbox"/> DISTURBED	<input type="checkbox"/> NO RECOVERY	<input type="checkbox"/> SPT	<input type="checkbox"/> A-CASING	<input type="checkbox"/> SHELBY TUBE	<input type="checkbox"/> CORE
BACKFILL TYPE	<input type="checkbox"/> BENTONITE	<input type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input type="checkbox"/> SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	USC	SOIL SYMBOL	GROUND ICE DESCRIPTION AND COMMENTS	SALINITY (ppt)		CLAY (%)		SILT (%)		SAND (%)		Elevation (m)
							6	12	18	24	20	40	60	80	
25						- ice inclusions, 10 mm thick								850.0	
26	- cobble													849.0	
27	- becomes some gravel		G18											848.0	
28						- ice lenses 30 mm thick at 400 mm spacing to 29.4 m, 5-10% ice content								847.0	
29			G19											846.0	
30			G20											845.0	
31	SAND and SILT (TILL) - some gravel, some cobbles, trace clay, stiff, low plastic, brown, frozen					- ice lens, 70 mm thick, clear								844.0	
32			G21											843.0	
33	- boulder				SM	- ice lenses, 30 mm thick at 300 mm spacing to 33.5 m, 10% ice content								842.0	
34			G22											841.0	
35	- cobble 200 mm													840.0	
36			G23											839.0	
37			G24			- Vs, 20 m thick at 50 mm spacing, ice lenses up to 50 mm thick, 30 % ice content to 37.0 m								838.0	
38	SAND (TILL) - silty, some gravel, stiff, brown, frozen													837.0	
39			G25											836.0	
40	- cobble 100 mm													835.0	
41	- becomes gravelly													834.0	
42	- gravel seam		G26											833.0	
43	- gravelly, some weathered rock													832.0	
44	SAND and GRAVEL (RESIDUUM) - some silt, some cobbles, coarse grained, tan													831.0	
45			G27											830.0	
46	- oxidization staining													829.0	
47			G28											828.0	
48			G29											827.0	
49														826.0	
50	WEATHERED BEDROCK - estimated weak, pulverized by drill													825.0	
	END OF BOREHOLE @ 45.7 m (likely bedrock, drilling stopped due to slow, hard drilling and poor sample recovery)													824.0	
	NOTE: Modified USC Symbols shown where data available													823.0	

 A TETRA TECH COMPANY	LOGGED BY: KAE	COMPLETION DEPTH: 45.7m
	REVIEWED BY: JGD	COMPLETE: 9/28/2011
	DRAWING NO:	Page 2 of 2

Fall 2011 Geotechnical Drilling	CLIENT: Minto Explorations Ltd.	BOREHOLE NO: 11-G23
Boulder Laydown	DRILL: Mini Sonic	PROJECT NO: W14101068.033
Minto Mine, YT	6944838N; 384839.6E; Zone 8	ELEVATION: 808.8m

SAMPLE TYPE	DISTURBED	NO RECOVERY	SPT	A-CASING	SHELBY TUBE	CORE
BACKFILL TYPE	BENTONITE	PEA GRAVEL	SLOUGH	GROUT	DRILL CUTTINGS	SAND



 eba A TETRA TECH COMPANY	LOGGED BY: KAE	COMPLETION DEPTH: 65.5m
	REVIEWED BY: JGD	COMPLETE: 9/30/2011
	DRAWING NO:	Page 1 of 3

Fall 2011 Geotechnical Drilling		CLIENT: Minto Explorations Ltd.		BOREHOLE NO: 11-G23					
Boulder Laydown		DRILL: Mini Sonic		PROJECT NO: W14101068.033					
Minto Mine, YT		6944838N; 384839.6E; Zone 8		ELEVATION: 808.8m					
SAMPLE TYPE		■ DISTURBED	□ NO RECOVERY	⊗ SPT	▨ A-CASING	▨ SHELBY TUBE	▨ CORE		
BACKFILL TYPE		■ BENTONITE	⊙ PEA GRAVEL	▨ SLOUGH	⊙ GROUT	▨ DRILL CUTTINGS	⊙ SAND		
Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	USC	SOIL SYMBOL	GROUND ICE DESCRIPTION AND COMMENTS	PLASTIC M.C. LIQUID		Elevation (m)
							■ SPT (N)	● SILT (%)	
							20 40 60 80	20 40 60 80	
23			G15						785.0
24									
25	CLAY (TILL) - silty, some gravel, trace sand, firm, likely low to medium plastic, dark grey		G16			- Vx, 5 %	●	▲ ◆ ●	784.0
26									783.0
27									782.0
28	- gravel seam <30 mm, oxidization staining SILT - sandy, trace gravel, trace clay, very wet, soft, low to non-plastic, tan		G17			- sample likely frozen but thawed from drill action, likely Nbe			781.0
29									780.0
30	SAND and SILT - trace gravel, trace clay, reddish brown		G18			- ice lens, 10 mm thick, clear			779.0
31	GRAVEL - some sand, some silt, occasional cobbles, gravel <30 mm, subrounded, loose, tan		G19						778.0
32	- becomes grey								777.0
33	SILT and SAND (TILL) - trace clay, trace gravel, stiff, non-plastic, dark grey, frozen		G20	ML			●	■ ▲ ●	776.0
34									775.0
35			G21						774.0
36						- Vx, 5% to 35.5 m			773.0
37						- Vx, 10% to 37.7 m			772.0
38									771.0
39	CLAY (TILL) - silty, sandy, trace gravel, firm, medium plastic, dark grey, frozen		G23						770.0
40			G24	Cl		- Vx, 5%	▨ ●	■ ▲ ◆ ●	769.0
41						- Vx, 10% to 41.0 m			768.0
42			G25			- ice lens, 10 mm thick, white			767.0
43	- varved clay, grey and beige		G26			- Nbn			766.0
44									765.0
45									764.0
46	- sand seam, coarse, grey, 50 mm thick - becomes beige								763.0



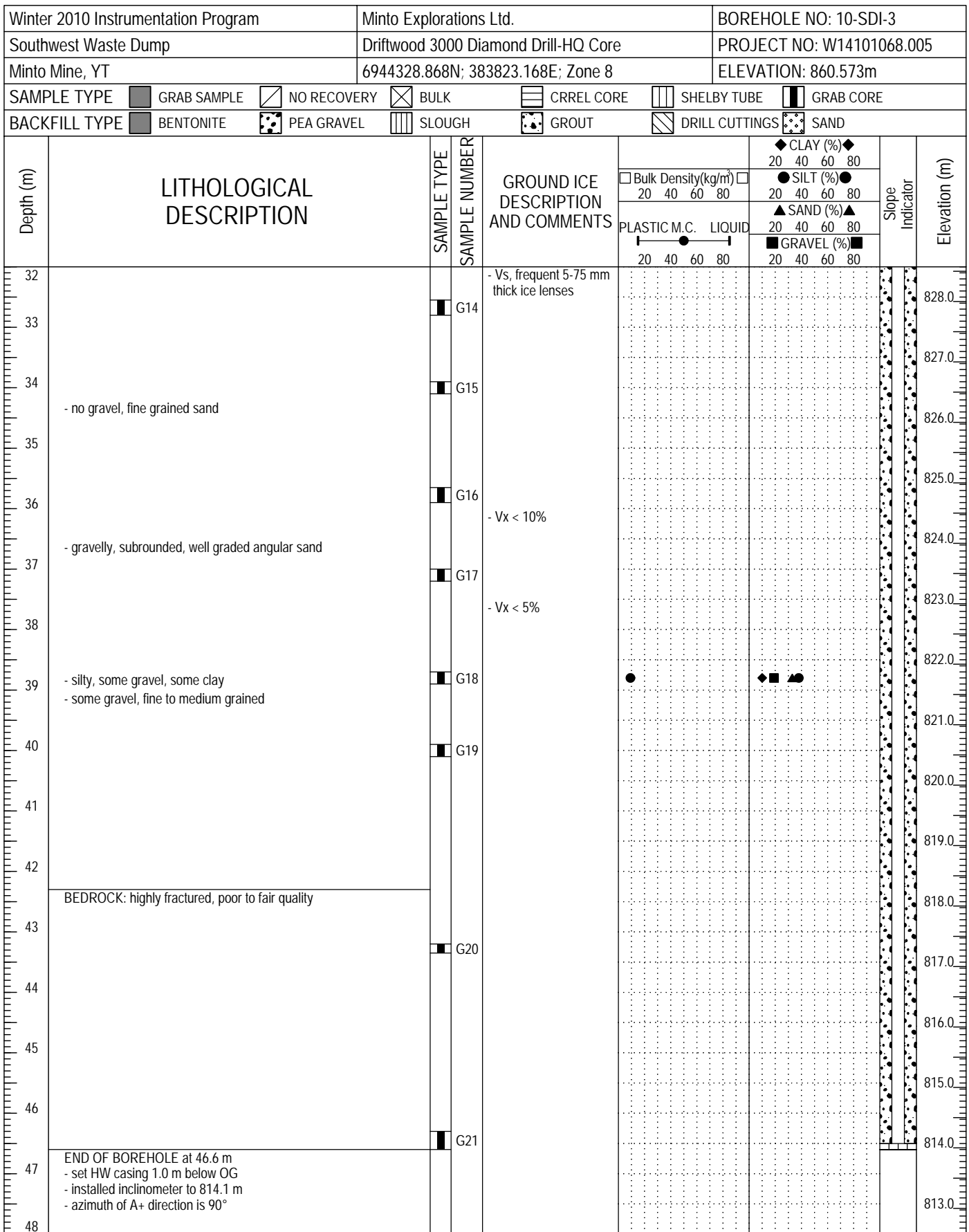
LOGGED BY: KAE	COMPLETION DEPTH: 65.5m
REVIEWED BY: JGD	COMPLETE: 9/30/2011
DRAWING NO:	Page 2 of 3

Winter 2010 Instrumentation Program		Minto Explorations Ltd.		BOREHOLE NO: 10-SDI-3								
Southwest Waste Dump		Driftwood 3000 Diamond Drill-HQ Core		PROJECT NO: W14101068.005								
Minto Mine, YT		6944328.868N; 383823.168E; Zone 8		ELEVATION: 860.573m								
SAMPLE TYPE		<input type="checkbox"/> GRAB SAMPLE	<input type="checkbox"/> NO RECOVERY	<input type="checkbox"/> BULK	<input type="checkbox"/> CRREL CORE	<input type="checkbox"/> SHELBY TUBE	<input type="checkbox"/> GRAB CORE					
BACKFILL TYPE		<input type="checkbox"/> BENTONITE	<input type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input type="checkbox"/> SAND					
Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density(kg/m <sup>3</sup> )		PLASTIC M.C.		LIQUID		Slope Indicator	Elevation (m)
					20	40	60	80	20	40		
16				thick ice lenses								844.0
17												843.0
18			G6									842.0
19			G7									841.0
20			G8									840.0
21												839.0
22			G9									838.0
23			G10									837.0
24			G11									836.0
25	- 200 mm cobble											835.0
26	- gravelly < 15 mm, subangular											834.0
27	- gravel < 40 mm, subangular		G12									833.0
28												832.0
29				- Nbn - Vx 2% - Vs < 5%, 20 mm thick ice lenses								831.0
30			G13									830.0
31												829.0
32	- trace to no gravel			- Nbn - Vx < 5%								829.0



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LOGGED BY: JSB & MD	COMPLETION DEPTH: 46.6m
REVIEWED BY: JPB	COMPLETE: 1/29/2010
DRAWING NO:	Page 2 of 3



**EBA Engineering Consultants Ltd.**

LOGGED BY: JSB & MD

REVIEWED BY: JPB

DRAWING NO:

COMPLETION DEPTH: 46.6m

COMPLETE: 1/29/2010

Page 3 of 3

Winter 2010 Instrumentation Program		Minto Explorations Ltd.		BOREHOLE NO: 10-SDT/P-2					
Southwest Waste Dump		Driftwood 3000 Diamond Drill-HQ Core		PROJECT NO: W14101068.005					
Minto Mine, YT		6944595.056N; 383971.298E; Zone 8		ELEVATION: 847.114m					
SAMPLE TYPE		<input checked="" type="checkbox"/> GRAB SAMPLE	<input type="checkbox"/> NO RECOVERY	<input checked="" type="checkbox"/> BULK	<input type="checkbox"/> CRREL CORE	<input type="checkbox"/> SHELBY TUBE	<input checked="" type="checkbox"/> GRAB CORE		
BACKFILL TYPE		<input checked="" type="checkbox"/> BENTONITE	<input type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input type="checkbox"/> SAND		
Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	<input type="checkbox"/> Bulk Density(kg/m <sup>3</sup> ) <input type="checkbox"/> PLASTIC M.C. LIQUID 20 40 60 80		<input checked="" type="checkbox"/> CLAY (%) 20 40 60 80	Vibrating Wire Vibrating Wire Thermistor	Elevation (m)
					<input type="checkbox"/> SILT (%) 20 40 60 80	<input type="checkbox"/> SAND (%) 20 40 60 80	<input type="checkbox"/> GRAVEL (%) 20 40 60 80		
0	WASTE ROCK FILL								847.0
1									846.0
2									845.0
3	ORGANICS: moss rootlets, dark brown		G1	- Nbn					844.0
4	SAND: gravelly, silty, well graded, subrounded gravel, medium brown		G2	- Vx < 5%					843.0
5	- no gravels below 4.5 m, fine to medium grained sand, olive grey to blackish								842.0
6	- gravelly fine to medium grained subrounded, sand angular, some cobbles		G3						841.0
7			G4	- Nbn					840.0
8	SAND (TILL): some gravel, trace silt, fine grained sand, gravel < 20 mm, subangular, dark greyish brown		G5	- Vx < 5%, lenses 10-15 mm thick					839.0
9				- Nbn					838.0
10			G6	- Vx < 2%					837.0
11			G7	- Vs < 5%, lenses 5-10 mm thick					836.0
12									835.0
13			G8	- Vs, lenses 10-25 mm thick					834.0
14									833.0
15	END OF BOREHOLE at 14.6 m		G9						832.0
16	- backfilled with grout from 14.6 m to 2.7 m								831.0
17	- backfilled with bentonite chips from 0.4 m to surface								
	-SDP-2A tip elevation at 843.4 m								
	-SDP-2B tip elevation at 842.7 m								
	-SDT-2 beads between 845.4 m and 834.4 m								



EBA Engineering Consultants Ltd.

LOGGED BY: JSB & MD

REVIEWED BY: JPB

DRAWING NO:

COMPLETION DEPTH: 14.6m

COMPLETE: 1/31/2010

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Winter 2010 Instrumentation Program		Minto Explorations Ltd.		BOREHOLE NO: 10-SDT/P-3													
Southwest Waste Dump		Driftwood 3000 Diamond Drill-HQ Core		PROJECT NO: W14101068.005													
Minto Mine, YT		6944333.873N; 383824.672E; Zone 8		ELEVATION: 860.166m													
SAMPLE TYPE		<input checked="" type="checkbox"/> GRAB SAMPLE	<input type="checkbox"/> NO RECOVERY	<input checked="" type="checkbox"/> BULK	<input type="checkbox"/> CRREL CORE	<input type="checkbox"/> SHELBY TUBE	<input checked="" type="checkbox"/> GRAB CORE										
BACKFILL TYPE		<input checked="" type="checkbox"/> BENTONITE	<input checked="" type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input checked="" type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input checked="" type="checkbox"/> SAND										
Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density (kg/m <sup>3</sup> )		CLAY (%)		SILT (%)	SAND (%)		GRAVEL (%)	Vibrating Wire	Vibrating Wire	Thermistor	Elevation (m)	
					20	40	60	80		20	40						60
0	WASTE ROCK FILL																860.0
1																	859.0
2																	858.0
3																	857.0
4																	856.0
5	SAND AND SILT: well graded sand, blackish brown		G1	- Nbn													855.0
6																	854.0
7	SAND (TILL): gravelly, silty, trace of clay, well graded subangular sand, subrounded gravel, medium to dark grey		G2	- Vs, 2-3 mm thick ice lenses - Nbn													853.0
8																	852.0
9	- boulder		G3														851.0
10	- some cobbles		G4	- Nbn - Vs, 3-5 mm thick ice lenses													850.0
11	- some silt to silty			- Nbn													849.0
12			G5														848.0
13	- trace cobbles			- Vx, 5-10%													847.0
14																	846.0
15			G6														845.0
16	END OF BOREHOLE at 15.2 - backfilled with cement from 15.2 m to 4.9 m - backfilled with bentonite chips from 0.5 m to surface - SDP-3A tip elevation at 854.3 - SDP-3B tip elevation at 853.6 - SDT-3 beads between 858.4 m and 845.4 m		G7	- Vs, 5-10 mm thick ice lenses, spaced 300-400 mm													844.0
17																	



**EBA Engineering Consultants Ltd.**

LOGGED BY: JSB

REVIEWED BY: JPB

DRAWING NO:

COMPLETION DEPTH: 15.2m

COMPLETE: 1/28/2010

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Winter 2010 Instrumentation Program		Minto Explorations Ltd.		BOREHOLE NO: 10-SDT/P-4					
Southwest Waste Dump		Driftwood 3000 Diamond Drill-HQ Core		PROJECT NO: W14101068.005					
Minto Mine, YT		6944163.622N; 383783.542E; Zone 8		ELEVATION: 860.994m					
SAMPLE TYPE		<input checked="" type="checkbox"/> GRAB SAMPLE	<input type="checkbox"/> NO RECOVERY	<input checked="" type="checkbox"/> BULK	<input type="checkbox"/> CRREL CORE	<input type="checkbox"/> SHELBY TUBE	<input type="checkbox"/> GRAB CORE		
BACKFILL TYPE		<input type="checkbox"/> BENTONITE	<input type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input type="checkbox"/> SAND		
Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	<input type="checkbox"/> Bulk Density(kg/m <sup>3</sup> ) <input type="checkbox"/> PLASTIC M.C. LIQUID 20 40 60 80      20 40 60 80		◆ CLAY (%) ◆ 20 40 60 80 ● SILT (%) ● 20 40 60 80 ▲ SAND (%) ▲ 20 40 60 80 ■ GRAVEL (%) ■ 20 40 60 80	Vibrating Wire Vibrating Wire Thermistor	Elevation (m)
0	WASTE ROCK FILL								860.0
1									
2	ORGANICS: peat, abundant rootlets, very dark brown			- Nbe					859.0
3	SAND: gravelly, trace silt, gravel < 30 mm subrounded, brown			- Nbn - Vr < 10%, 2-3 mm thick lenses					858.0
4		<input checked="" type="checkbox"/>	G1						857.0
5									856.0
6	- increasing gravel content, frequent cobbles < 150 mm, subangular	<input checked="" type="checkbox"/>	G2						855.0
7									854.0
8	SAND (TILL): some gravel, trace silt, gravel < 20 mm subangular, dark greyish brown	<input checked="" type="checkbox"/>	G3						853.0
9	- 100 mm cobble	<input checked="" type="checkbox"/>	G4						852.0
	- 150 mm cobble								851.0
10	- gravelly								850.0
11									849.0
12		<input checked="" type="checkbox"/>	G5						848.0
13		<input checked="" type="checkbox"/>	G6						847.0
14	END OF BOREHOLE at 13.1 m - backfilled with cement from 11.6 m to 1.5 m - SDP-4A tip elevation at 858.5 m - SDP-4B tip elevation at 862.4 m - SDT-4 beads between 860.6 m and 849.4 (one bead located above OG)								846.0



**EBA Engineering Consultants Ltd.**

LOGGED BY: MD

REVIEWED BY: JPB

DRAWING NO:

COMPLETION DEPTH: 13.1m

COMPLETE: 1/30/2010

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Water Conveyance Network		Minto Explorations Ltd.		BOREHOLE NO: 10-MCDS-01						
Minto Creek Detention Structure		Driftwood 3000 Diamond Drill-HQ Core		PROJECT NO: W14101068.013						
Minto Mine, YT		6945193.251N; 385882.288E; Zone 8		ELEVATION: 730.668m						
SAMPLE TYPE		<input checked="" type="checkbox"/> GRAB SAMPLE	<input type="checkbox"/> NO RECOVERY	<input checked="" type="checkbox"/> BULK	<input type="checkbox"/> CRREL CORE	<input type="checkbox"/> SHELBY TUBE	<input checked="" type="checkbox"/> GRAB CORE			
BACKFILL TYPE		<input checked="" type="checkbox"/> BENTONITE	<input checked="" type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input checked="" type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input checked="" type="checkbox"/> SAND			
Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density(kg/m <sup>3</sup> )		PLASTIC M.C. LIQUID		Monitoring well	Elevation (m)
					20	40	60	80		
0	ROCK FILL									730.0
1				- Nbe						729.0
2	PEAT - trace sand, fine fibrous, brown	<input checked="" type="checkbox"/>	G1							728.0
	SAND - some gravel, some silt, medium grained, brown - poor recovery from 2. 4 to 9.1 m		G2							727.0
	- only cobbles and coarse gravel recovered, fines washed away		G3	- Nbe - 5 mm thick ice lens, clear						726.0
3										725.0
4										724.0
5	- cobbles and gravel subangular to subrounded									723.0
6										722.0
7										721.0
8										720.0
9	BEDROCK - highly weathered, closely spaced joints, oxide stained joints									719.0
10										718.0
11	- becomes more competent, less staining									717.0
12	END OF BOREHOLE 11.6 m									716.0



**EBA Engineering Consultants Ltd.**

LOGGED BY: JGD

REVIEWED BY: JPB

DRAWING NO:

COMPLETION DEPTH: 11.6m

COMPLETE:

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Fall 2011 Geotechnical Drilling		CLIENT: Minto Explorations Ltd.		BOREHOLE NO: 11-G13											
Pelly Laydown		DRILL: Mini Sonic		PROJECT NO: W14101068.033											
Minto Mine, YT		6944734N; 383997.9E; Zone 8		ELEVATION: 859.9m											
SAMPLE TYPE		<input type="checkbox"/> DISTURBED <input type="checkbox"/> NO RECOVERY <input type="checkbox"/> SPT	<input type="checkbox"/> A-CASING <input type="checkbox"/> SHELBY TUBE <input type="checkbox"/> CORE												
BACKFILL TYPE		<input type="checkbox"/> BENTONITE <input type="checkbox"/> PEA GRAVEL <input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT <input type="checkbox"/> DRILL CUTTINGS <input type="checkbox"/> SAND												
Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	USC	SOIL SYMBOL	GROUND ICE DESCRIPTION AND COMMENTS	SALINITY (ppt)		CLAY (%)		SILT (%)		SAND (%)		Elevation (m)
							6	12	18	24	20	40	60	80	
							SPT (N)		PLASTIC M.C.		LIQUID				
							20	40	60	80	20	40	60	80	
							GRAVEL (%)								
							20	40	60	80	20	40	60	80	
0	GRAVEL (WASTE ROCK FILL) - sandy, some silt, some cobbles, angular, well graded, <75 mm, loose, brown														859.0
1	- boulder		G1												
2	GRAVEL and SAND - trace silt, trace cobbles, sub-angular, well graded, <20 mm, damp, brown														858.0
3			G2												857.0
4	- boulders, sample washed to 6.1 m														856.0
5															855.0
6															854.0
7	- becomes silty, some cobbles, some sand, trace clay, sub-rounded, <30 mm, moist														853.0
8			G3												852.0
9	- becomes grey														851.0
10	SAND (FILL) - silty, some gravel, trace clay, fine to medium grained, moist, loose, brown														850.0
11			G4												849.0
12	- cobble, 200 mm thick														848.0
13	- becomes some silt														847.0
14															846.0
15															845.0
16	ORGANICS - root inclusions														844.0
17			G5												843.0
			G6												
	SAND - some clay, some gravel, well graded, wet, loose, brown		G7												
	SAND and SILT (TILL) - trace gravel, trace clay, well graded, firm, low plastic, brown, frozen		G8												


Fall 2011 Geotechnical Drilling		CLIENT: Minto Explorations Ltd.		BOREHOLE NO: 11-G13											
Pelly Laydown		DRILL: Mini Sonic		PROJECT NO: W14101068.033											
Minto Mine, YT		6944734N; 383997.9E; Zone 8		ELEVATION: 859.9m											
SAMPLE TYPE		■ DISTURBED	□ NO RECOVERY	⊗ SPT	▨ A-CASING	▨ SHELBY TUBE	▨ CORE								
BACKFILL TYPE		■ BENTONITE	⊙ PEA GRAVEL	▨ SLOUGH	⊙ GROUT	▨ DRILL CUTTINGS	⊙ SAND								
Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	USC	SOIL SYMBOL	GROUND ICE DESCRIPTION AND COMMENTS	SALINITY (ppt)		CLAY (%)		SILT (%)		SAND (%)		Elevation (m)
							6	12	18	24	20	40	60	80	
							SPT (N)		PLASTIC M.C.		LIQUID				
							20	40	60	80	20	40	60	80	
							20		40		60		80		
17	- some gravel					- Vs, 10 mm thick by 10 mm spacing to 17.8 m, white, 50% ice content									842.0
18			G9												841.0
19			G10			- ice lens 10 mm thick	●			■	▲				840.0
20	CLAY (TILL) - silty, sandy, trace clay, trace gravel, low plastic, greyish brown, frozen														839.0
21			G11	CL	▨		●	-1		■	▲	●			838.0
22															837.0
23			G12			- ice lens 10 mm thick, white									836.0
24			G13												835.0
25	- becomes some gravel		G15			- Vx/Vr/Vs 40% from 24.4 to 26.0 m	◇			◆	■	▲			834.0
26			G16				●								833.0
27			G17			- ice lens 100 mm thick, white									832.0
28	- ICE and SILT (TILL), to 29.0 m		G18			- Vx, 20%, to 27.4 m									831.0
29			G19												830.0
30	- becomes stiff, grey		G20												829.0
31			G21	CL	▨	- ice lens 50 mm thick	●			◆	■	▲	●		828.0
32			G22			- Vs, 10 mm thick at 50 mm spacing to 30.5 m, 20% ice content									827.0
33	- ICE and CLAY (TILL) lenses, 45 mm thick at 800 mm spacing to 35.7 m					- ice lens 50 mm thick, clear									826.0
34			G23			- ice lenses 30 mm thick at 200 mm spacing to 32.6 m, clear,									



Fall 2011 Geotechnical Drilling	CLIENT: Minto Explorations Ltd.	BOREHOLE NO: 11-G13
Pelly Laydown	DRILL: Mini Sonic	PROJECT NO: W14101068.033
Minto Mine, YT	6944734N; 383997.9E; Zone 8	ELEVATION: 859.9m

SAMPLE TYPE	<input type="checkbox"/> DISTURBED	<input type="checkbox"/> NO RECOVERY	<input type="checkbox"/> SPT	<input type="checkbox"/> A-CASING	<input type="checkbox"/> SHELBY TUBE	<input type="checkbox"/> CORE
BACKFILL TYPE	<input type="checkbox"/> BENTONITE	<input type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input type="checkbox"/> SAND


Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	USC	SOIL SYMBOL	GROUND ICE DESCRIPTION AND COMMENTS	SPT (N)		PLASTIC M.C.		LIQUID		CLAY (%)		SILT (%)		SAND (%)		GRAVEL (%)		Elevation (m)
							20	40	60	80	20	40	60	80	20	40	60	80	20	40	
34			G24			ice content 15%															
35	- becomes gravelly		G25																		
36	ICE and CLAY (TILL) lense - becomes very stiff		G27			- Vr/Vc, 5%, to 35.5 m															825.0
37			G28																		824.0
38			G26			- ice lenses 25 mm thick at 400 mm spacing to 39.6 m, ice content 5%															823.0
39			G29																		822.0
40	- ICE and CLAY (TILL), 100 mm thick		G30																		821.0
41			G31																		820.0
42	- ICE and CLAY (TILL), 100 mm thick		G32																		819.0
43			G33																		818.0
44	- becomes trace gravel		G34																		817.0
45	- ICE and CLAY (TILL), 100 mm thick		G35			- ice lens 100 mm thick, clear															816.0
46						- ice lens 100 mm thick, white															815.0
47																					814.0
48	- sand seam, silty, trace gravel, well graded, wet, dark grey to 48.5 m		G36			- sample likely thawed due to drilling action, Nf															813.0
49			G37																		812.0
50			G38			- ice lens 30 mm thick, clear															811.0
51						- ice lenses 50 mm thick at 300 mm spacing															810.0

	LOGGED BY: KAE	COMPLETION DEPTH: 65.5m
	REVIEWED BY: JGD	COMPLETE: 9/23/2011
	DRAWING NO:	Page 3 of 4

Fall 2011 Geotechnical Drilling	CLIENT: Minto Explorations Ltd.	BOREHOLE NO: 11-G13
Pelly Laydown	DRILL: Mini Sonic	PROJECT NO: W14101068.033
Minto Mine, YT	6944734N; 383997.9E; Zone 8	ELEVATION: 859.9m

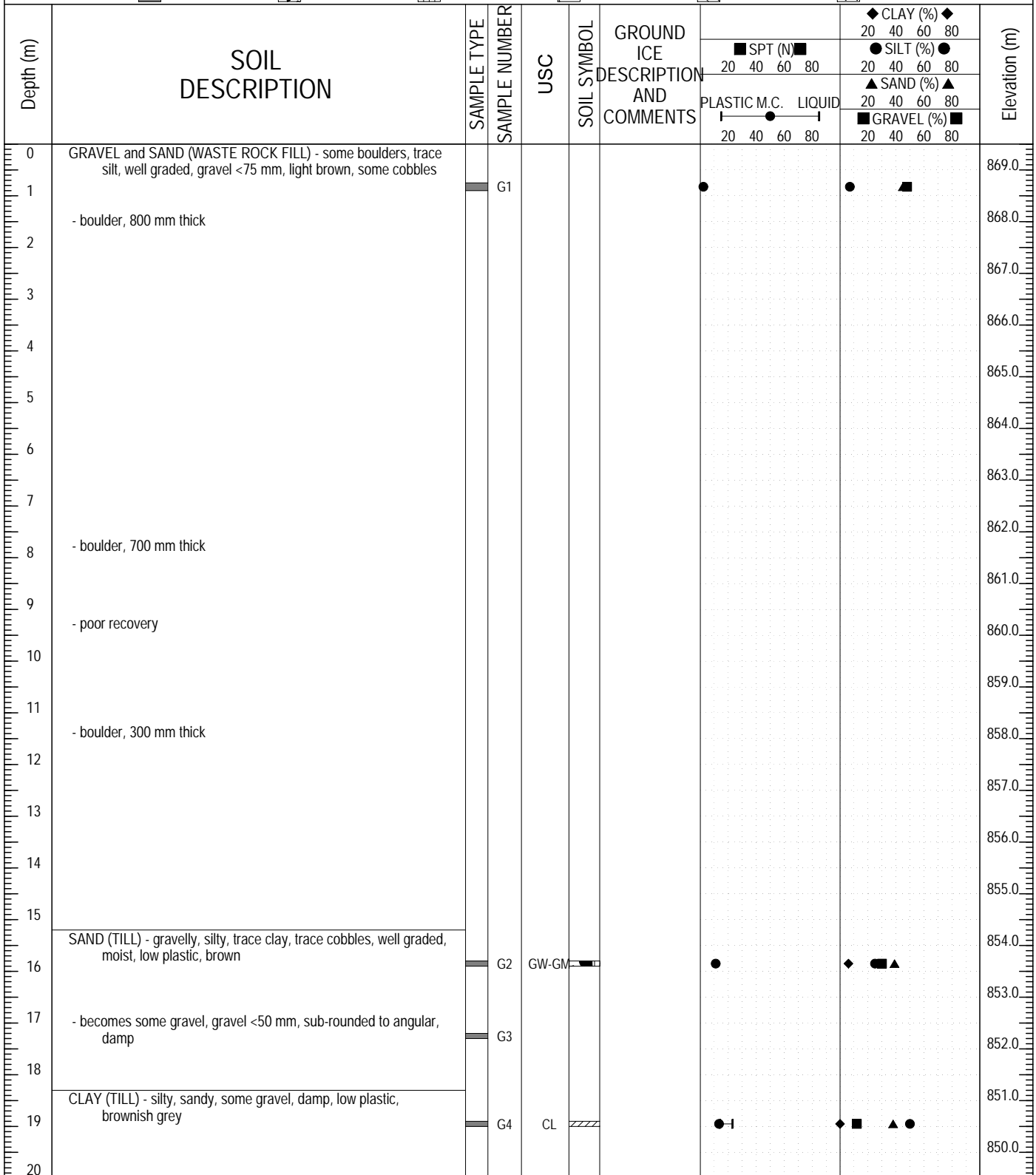
SAMPLE TYPE	<input type="checkbox"/> DISTURBED	<input type="checkbox"/> NO RECOVERY	<input type="checkbox"/> SPT	<input type="checkbox"/> A-CASING	<input type="checkbox"/> SHELBY TUBE	<input type="checkbox"/> CORE
BACKFILL TYPE	<input type="checkbox"/> BENTONITE	<input type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input type="checkbox"/> SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	USC	SOIL SYMBOL	GROUND ICE DESCRIPTION AND COMMENTS	SPT (N)		PLASTIC M.C.		LIQUID		CLAY (%)		SILT (%)		SAND (%)		GRAVEL (%)		Elevation (m)
							6	12	18	24	20	40	60	80	20	40	60	80	20	40	
51	- very stiff		G39																		
52	- becomes some sand, no gravel, dark grey - sand seam 20 mm thick		G40																		808.0
53			G42			- ice lens 10 mm thick, clear															807.0
54			G41			- Vs, 5 mm thick at 10 mm spacing tp 53.4 m; 35% ice content															806.0
55	- becomes sandy, some gravel, trace cobbles, stiff - becomes very stiff		G43			- ice lens 10 mm thick, clear															805.0
56			G44		CL	- sample likely thawed due to drilling action															804.0
57			G44			- ice lenses up to 200 mm thick at 300 mm spacing to 61.1 m, 35% ice content															803.0
58			G45																		802.0
59	SILT (TILL) - sandy, some clay, some gravel, very stiff, low to non-plastic, dark grey, frozen		G45																		801.0
60			G46																		800.0
61			G47																		799.0
62			G46																		798.0
63			G47																		797.0
64			G48																		796.0
65			G48																		795.0
66	END OF BOREHOLE @ 65.5 m (maximum depth of drill) NOTE: Modified USC Symbols shown where data available.																				794.0
67																					793.0
68																					792.0

 A TETRA TECH COMPANY	LOGGED BY: KAE	COMPLETION DEPTH: 65.5m
	REVIEWED BY: JGD	COMPLETE: 9/23/2011
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Fall 2011 Geotechnical Drilling	CLIENT: Minto Explorations Ltd.	BOREHOLE NO: 11-G14
Southwest Dump	DRILL: Mini Sonic	PROJECT NO: W14101068.033
Minto Mine, YT	6944414N; 383801E; Zone 8	ELEVATION: 869.5m

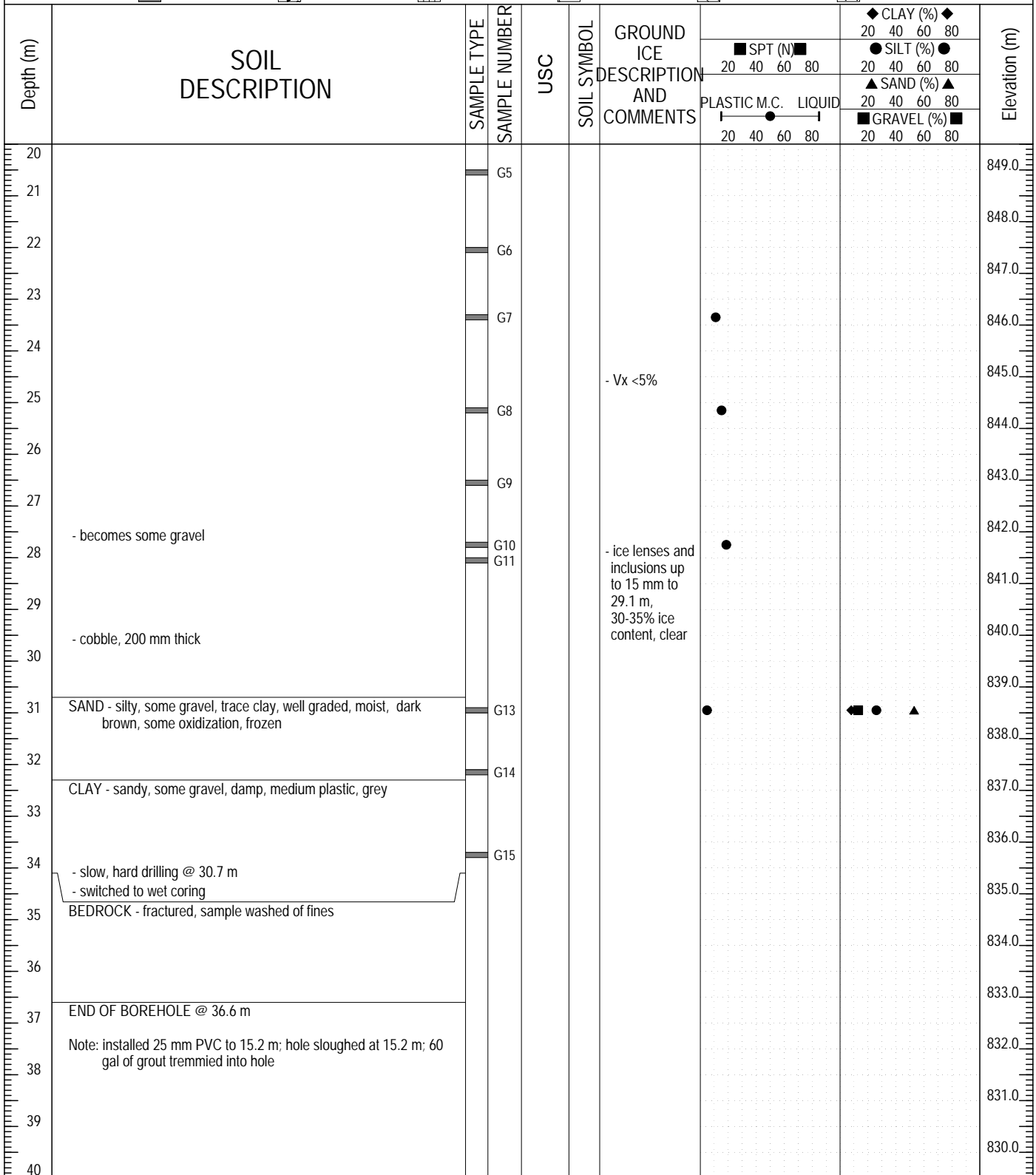
SAMPLE TYPE	DISTURBED	NO RECOVERY	SPT	A-CASING	SHELBY TUBE	CORE
BACKFILL TYPE	BENTONITE	PEA GRAVEL	SLOUGH	GROUT	DRILL CUTTINGS	SAND




 eba A TETRA TECH COMPANY	LOGGED BY: KAE	COMPLETION DEPTH: 36.6m
	REVIEWED BY: JGD	COMPLETE: 9/18/2011
	DRAWING NO:	Page 1 of 2

Fall 2011 Geotechnical Drilling	CLIENT: Minto Explorations Ltd.	BOREHOLE NO: 11-G14
Southwest Dump	DRILL: Mini Sonic	PROJECT NO: W14101068.033
Minto Mine, YT	6944414N; 383801E; Zone 8	ELEVATION: 869.5m

SAMPLE TYPE	<input type="checkbox"/> DISTURBED	<input type="checkbox"/> NO RECOVERY	<input type="checkbox"/> SPT	<input type="checkbox"/> A-CASING	<input type="checkbox"/> SHELBY TUBE	<input type="checkbox"/> CORE
BACKFILL TYPE	<input type="checkbox"/> BENTONITE	<input type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input type="checkbox"/> SAND

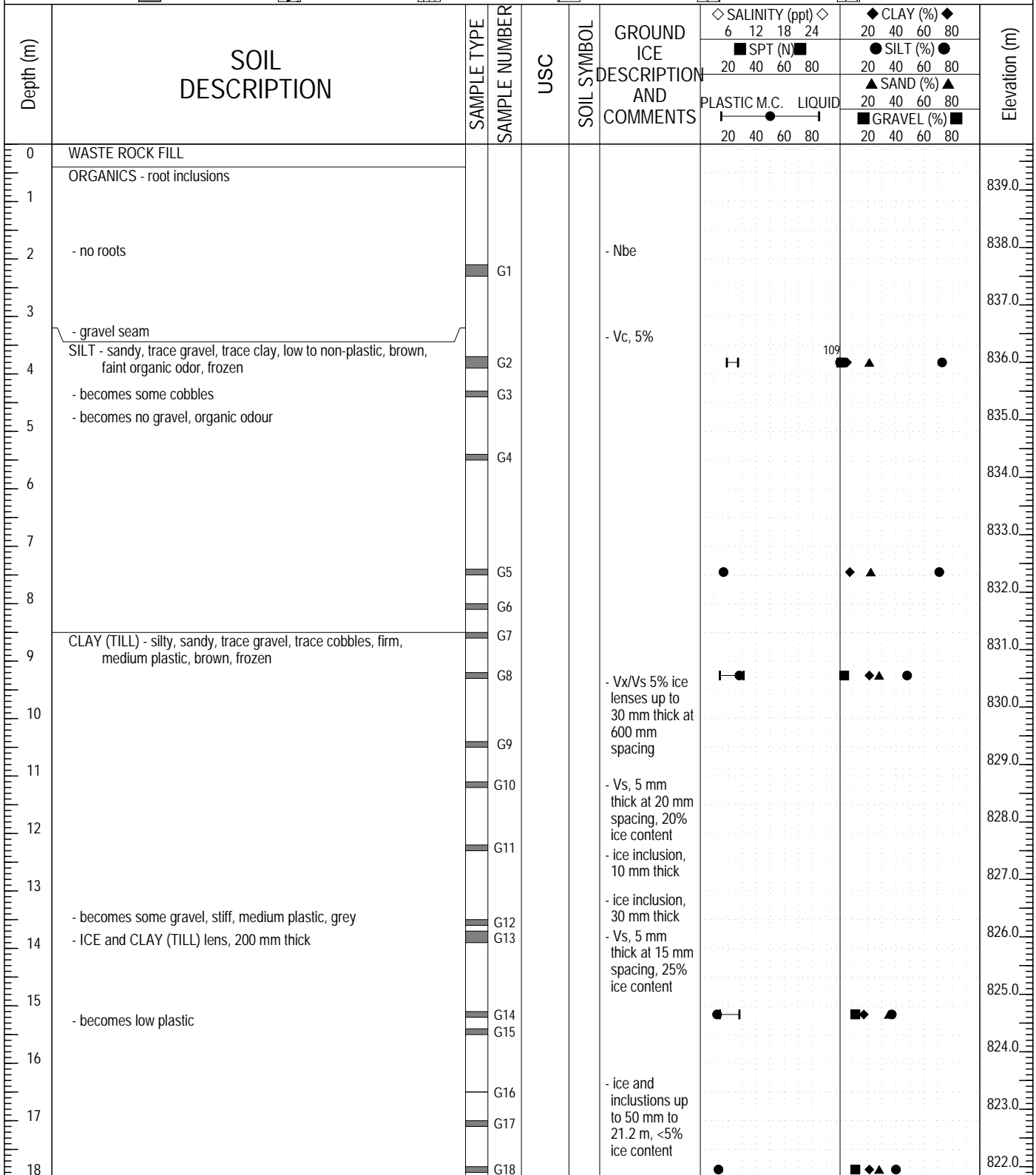


	LOGGED BY: KAE	COMPLETION DEPTH: 36.6m
	REVIEWED BY: JGD	COMPLETE: 9/18/2011
	DRAWING NO:	Page 2 of 2



Fall 2011 Geotechnical Drilling	CLIENT: Minto Explorations Ltd.	BOREHOLE NO: 11-G16
W15, Upper Minto Valley	DRILL: Mini Sonic	PROJECT NO: W14101068.033
Minto Mine, YT	6944633N; 384122.2E; Zone 8	ELEVATION: 839.8m

SAMPLE TYPE	DISTURBED	NO RECOVERY	SPT	A-CASING	SHELBY TUBE	CORE
BACKFILL TYPE	BENTONITE	PEA GRAVEL	SLOUGH	GROUT	DRILL CUTTINGS	SAND




 eba A TETRA TECH COMPANY	LOGGED BY: KAE	COMPLETION DEPTH: 65.5m
	REVIEWED BY: JGD	COMPLETE: 9/26/2011
	DRAWING NO:	Page 1 of 4

Fall 2011 Geotechnical Drilling	CLIENT: Minto Explorations Ltd.	BOREHOLE NO: 11-G16
W15, Upper Minto Valley	DRILL: Mini Sonic	PROJECT NO: W14101068.033
Minto Mine, YT	6944633N; 384122.2E; Zone 8	ELEVATION: 839.8m

SAMPLE TYPE	<input type="checkbox"/> DISTURBED	<input type="checkbox"/> NO RECOVERY	<input type="checkbox"/> SPT	<input type="checkbox"/> A-CASING	<input type="checkbox"/> SHELBY TUBE	<input type="checkbox"/> CORE
BACKFILL TYPE	<input type="checkbox"/> BENTONITE	<input type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input type="checkbox"/> SAND


Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	USC	SOIL SYMBOL	GROUND ICE DESCRIPTION AND COMMENTS	SPT (N)		PLASTIC M.C. LIQUID		CLAY (%)		SILT (%)		SAND (%)		GRAVEL (%)		Elevation (m)
							6	12	18	24	20	40	60	80	20	40	60	80	
18																			821.0
19			G19																820.0
20	SAND and SILT (TILL) - some clay, trace gravel, well graded sand, stiff, non-plastic silt, brown, frozen		G20																819.0
21			G21																818.0
22	- varved		G22			- ice lens, cloudy													817.0
23			G23																816.0
24	- organic seam, 30 mm thick - becomes trace gravel, very stiff, low to medium plastic - ICE and SAND and SILT (TILL) lens, 100 mm thick		G24																815.0
25	CLAY (TILL) - silty, sandy, trace gravel, very stiff, low to medium plastic, brown, frozen		G25			- Vx/Vs, 10%													814.0
26			G26																813.0
27			G27																812.0
28			G28																811.0
29	- sand seam, coarse		G29																810.0
30			G30			- ice lens, 35 mm thick, clear													809.0
31			G31																808.0
32			G32			- ice inclusion, 40 mm thick, white - ice lenses up to 40 mm thick at 500 mm spacing, to 35.4 m, <10% ice content													807.0
33			G33																806.0
34																			805.0
35	SILT - sandy, some clay, trace gravel, very stiff, low to medium plastic, brown, frozen					- Vs, 4 mm thick at 25 mm spacing, 100 mm thick, 15% ice													804.0

 A TETRA TECH COMPANY	LOGGED BY: KAE	COMPLETION DEPTH: 65.5m
	REVIEWED BY: JGD	COMPLETE: 9/26/2011
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Fall 2011 Geotechnical Drilling	CLIENT: Minto Explorations Ltd.	BOREHOLE NO: 11-G16
W15, Upper Minto Valley	DRILL: Mini Sonic	PROJECT NO: W14101068.033
Minto Mine, YT	6944633N; 384122.2E; Zone 8	ELEVATION: 839.8m

SAMPLE TYPE	<input type="checkbox"/> DISTURBED	<input type="checkbox"/> NO RECOVERY	<input type="checkbox"/> SPT	<input type="checkbox"/> A-CASING	<input type="checkbox"/> SHELBY TUBE	<input type="checkbox"/> CORE
BACKFILL TYPE	<input type="checkbox"/> BENTONITE	<input type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input type="checkbox"/> SAND


Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	USC	SOIL SYMBOL	GROUND ICE DESCRIPTION AND COMMENTS	SALINITY (ppt)		CLAY (%)		SILT (%)		SAND (%)		Elevation (m)
							6	12	18	24	20	40	60	80	
36			G34			content, Nbn following								803.0	
37	- clay seam, silty, some sand, soft, high plastic, brown, 100 mm thick		G35											802.0	
38	- clay seam, silty, some sand, soft, high plastic, brown, 100 mm thick		G36											801.0	
39	- becomes dark grey													800.0	
40	- boulder		G37											799.0	
41	- clay seam, silty, some sand, soft, high plastic, brown		G38											798.0	
42			G39											797.0	
43	- cobble		G40											796.0	
44	- becomes some cobbles, some oxidization staining		G41											795.0	
45			G42											794.0	
46	- becomes trace cobbles, low to non-plastic, dark grey		G43											793.0	
47			G44											792.0	
48	- becomes sandy, gravelly													791.0	
49														790.0	
50														789.0	
51														788.0	
52	- becomes some sand, some clay					- Nbe								787.0	
53	- sandy seams, 30 mm thick at 400 mm spacing to 59.4 m		G45											786.0	

	LOGGED BY: KAE	COMPLETION DEPTH: 65.5m
	REVIEWED BY: JGD	COMPLETE: 9/26/2011
	DRAWING NO:	Page 3 of 4

Fall 2011 Geotechnical Drilling	CLIENT: Minto Explorations Ltd.	BOREHOLE NO: 11-G16
W15, Upper Minto Valley	DRILL: Mini Sonic	PROJECT NO: W14101068.033
Minto Mine, YT	6944633N; 384122.2E; Zone 8	ELEVATION: 839.8m

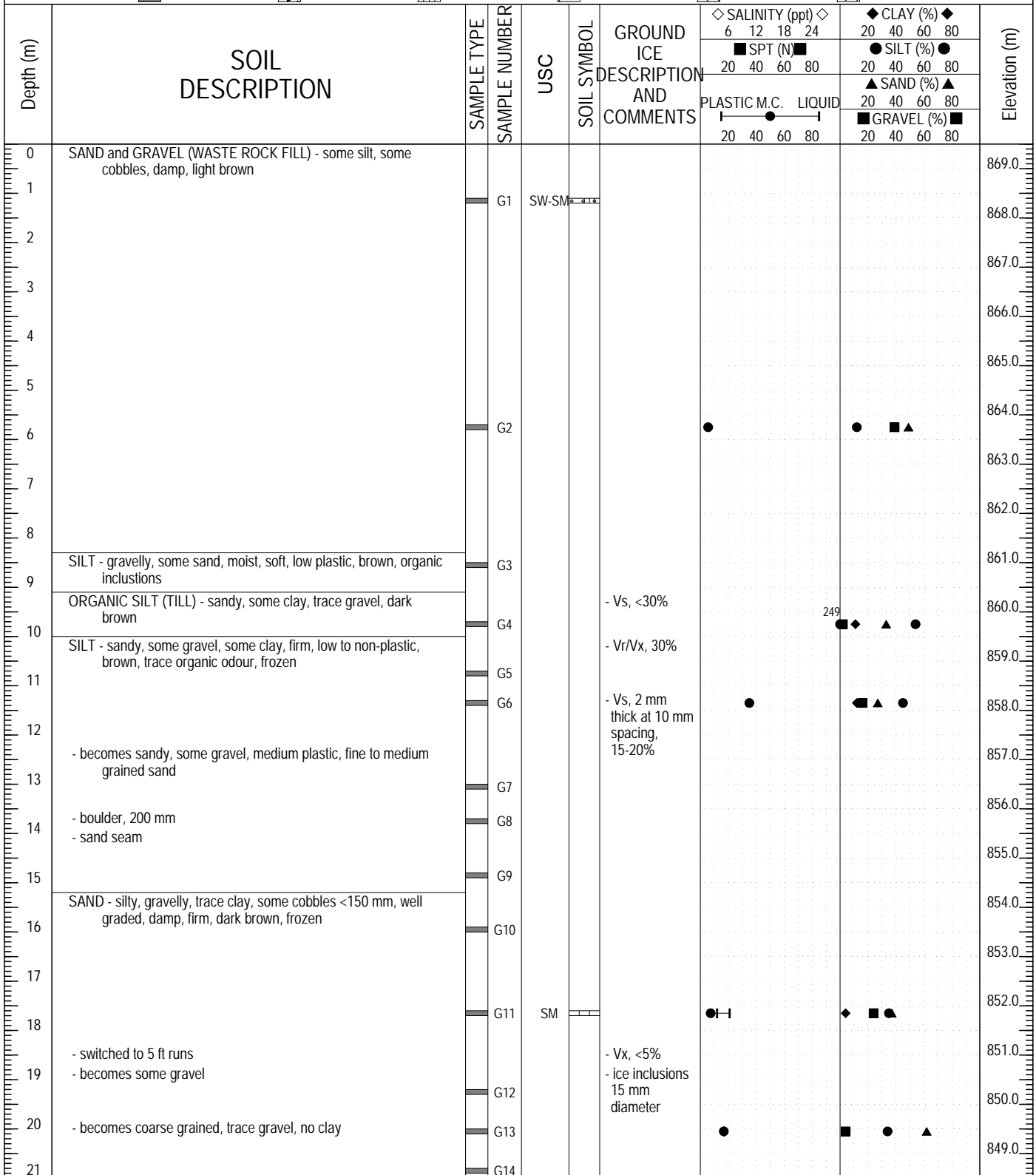
SAMPLE TYPE	<input type="checkbox"/> DISTURBED	<input type="checkbox"/> NO RECOVERY	<input type="checkbox"/> SPT	<input type="checkbox"/> A-CASING	<input type="checkbox"/> SHELBY TUBE	<input type="checkbox"/> CORE
BACKFILL TYPE	<input type="checkbox"/> BENTONITE	<input type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input type="checkbox"/> SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	USC	SOIL SYMBOL	GROUND ICE DESCRIPTION AND COMMENTS	SALINITY (ppt)		CLAY (%)		SILT (%)		SAND (%)		Elevation (m)
							6	12	18	24	20	40	60	80	
54			G46											785.0	
55						- Nbn								784.0	
56	- becomes trace gravel		G47											783.0	
57														782.0	
58	- becomes brown													781.0	
59			G48											780.0	
60	- becomes stiff, dark grey		G49											780.0	
61	CLAY (TILL) - some silt, trace sand, trace gravel, firm, high plastic, brown, frozen		G50											779.0	
62			G51											778.0	
63	SILT (TILL) - sandy, some clay, trace gravel, stiff, low to medium plastic, dark grey, frozen		G52											777.0	
64														776.0	
65	- becomes some sand, trace clay, low plastic, very stiff		G53	CL-ML										775.0	
66	END OF BOREHOLE @ 65.5 m (maximum depth of drill)													774.0	
67	NOTE: Modified USC Symbols shown where data available													773.0	
68														772.0	
69														771.0	
70														770.0	
71														769.0	
72														768.0	

	LOGGED BY: KAE	COMPLETION DEPTH: 65.5m
	REVIEWED BY: JGD	COMPLETE: 9/26/2011
	DRAWING NO:	Page 4 of 4

Fall 2011 Geotechnical Drilling	CLIENT: Minto Explorations Ltd.	BOREHOLE NO: 11-G15
Southwest Dump	DRILL: Mini Sonic	PROJECT NO: W14101068.033
Minto Mine, YT	6944235N; 383762.8E; Zone 8	ELEVATION: 869.5m

SAMPLE TYPE	DISTURBED	NO RECOVERY	SPT	A-CASING	SHELBY TUBE	CORE
BACKFILL TYPE	BENTONITE	PEA GRAVEL	SLOUGH	GROUT	DRILL CUTTINGS	SAND



 A TETRA TECH COMPANY	LOGGED BY: KAE	COMPLETION DEPTH: 57.9m
	REVIEWED BY: JGD	COMPLETE: 9/19/2011
	DRAWING NO:	Page 1 of 3

Fall 2011 Geotechnical Drilling	CLIENT: Minto Explorations Ltd.	BOREHOLE NO: 11-G15
Southwest Dump	DRILL: Mini Sonic	PROJECT NO: W14101068.033
Minto Mine, YT	6944235N; 383762.8E; Zone 8	ELEVATION: 869.5m

SAMPLE TYPE	DISTURBED	NO RECOVERY	SPT	A-CASING	SHELBY TUBE	CORE
BACKFILL TYPE	BENTONITE	PEA GRAVEL	SLOUGH	GROUT	DRILL CUTTINGS	SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	USC	SOIL SYMBOL	GROUND ICE DESCRIPTION AND COMMENTS	SPT (N)		PLASTIC M.C.		LIQUID		CLAY (%)		SILT (%)		SAND (%)		GRAVEL (%)		Elevation (m)
							20	40	60	80	20	40	60	80	20	40	60	80	20	40	
21	- clay seam, high plastic, 15 mm																				848.0
22			G15																		847.0
23			G16																		846.0
24						- Vx, 10%															845.0
25			G17			- ice inclusion 50 mm diameter															844.0
26	- ICE and SILT, 200 mm thick		G18			- ice lens															843.0
27			G19			- Vx, 50%															842.0
28	- ICE and SILT, 100 mm thick		G20																		841.0
29	- ICE and SILT, 100 mm thick																				840.0
30	SILT and SAND - trace gravel, firm, dark brown		G21	SC		- Vs, 3 mm thick at 30 mm spacing, 10% ice content															839.0
31	- sand seam		G22			- ice lens, clear															838.0
32			G23			- Vx, 20%															837.0
33	- becomes some gravel		G24																		836.0
34	- ICE and SAND		G25			- Vx, 5%															835.0
35	- ICE and SAND																				834.0
36	- ICE and SAND		G26			- ice lens 50 mm thick															833.0
37	- becomes stiff, begin lifting sample at signs of resistance in order to preserve permafrost samples		G27			- ice lens 50 mm thick															832.0
38	- ICE and SAND, 50 mm thick		G28			- ice lens 15 mm thick, clear															831.0
39	- becomes trace gravel, trace clay		G29																		830.0
40	- ICE and SAND, 50 mm thick		G30																		829.0
41	SILT (TILL) - some gravel, trace sand, stiff, low plastic, dark grey, frozen		G31			- ice lens 50 mm thick															828.0
42						- ice lens 50 mm thick															828.0

 A TETRA TECH COMPANY	LOGGED BY: KAE	COMPLETION DEPTH: 57.9m
	REVIEWED BY: JGD	COMPLETE: 9/19/2011
	DRAWING NO:	Page 2 of 3

Fall 2011 Geotechnical Drilling	CLIENT: Minto Explorations Ltd.	BOREHOLE NO: 11-G18
W15, Upper Minto Valley	DRILL: Mini Sonic	PROJECT NO: W14101068.033
Minto Mine, YT	6944482N; 384008.9E; Zone 8	ELEVATION: 848.8m

SAMPLE TYPE	DISTURBED	NO RECOVERY	SPT	A-CASING	SHELBY TUBE	CORE
BACKFILL TYPE	BENTONITE	PEA GRAVEL	SLOUGH	GROUT	DRILL CUTTINGS	SAND


Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	USC	SOIL SYMBOL	GROUND ICE DESCRIPTION AND COMMENTS	SPT (N)		PLASTIC M.C.		LIQUID		Elevation (m)
							6	12	18	24	20	40	
0	GRAVEL WASTE ROCK FILL) - sandy, trace silt, well graded, sub-rounded, dry, loose, grey											848.0	
1													
2	- root inclusions - boulder 600 mm diameter		G1	GW								847.0	
3	ORGANICS - wood and root inclusions, frozen		G2			- Nbe						846.0	
4	SILT - some sand, trace clay, stiff, low plastic, dark grey, organic odor, frozen		G3			- Vs, 1 mm thick at 10 mm spacing, 10% to 4.7 m						845.0	
5												844.0	
6			G4									843.0	
7	SAND - silty, some gravel, trace clay, well graded, moist, soft, low plastic, tan, frozen		G5	SM		- sample likely frozen but thawed by drill action						842.0	
8	- becomes some gravel - becomes sandy, some silt, low to medium plastic		G6									841.0	
9												840.0	
10	CLAY (TILL) - silty, sandy, trace gravel, firm, low to non-plastic, dark grey, frozen		G7	CL								839.0	
11	- becomes some sand, some silt, trace gravel, stiff, medium plastic					- sample likely frozen but thawed by drill action						838.0	
12			G8									837.0	
13			G9									836.0	
14						- ice lens 40 mm thick, clear						835.0	
15			G10			- Vx/Vs, 10% to 14.5 m - ice inclusions, 40 mm thick, white						834.0	
16						- ice lens 5 mm thick, white						833.0	
17	- ICE and CLAY (TILL), 100 mm thick		G11			- ice lens 50 mm thick,						832.0	

 A TETRA TECH COMPANY	LOGGED BY: KAE	COMPLETION DEPTH: 65.5m
	REVIEWED BY: JGD	COMPLETE: 10/1/2011
	DRAWING NO:	Page 1 of 4

Fall 2011 Geotechnical Drilling	CLIENT: Minto Explorations Ltd.	BOREHOLE NO: 11-G18
W15, Upper Minto Valley	DRILL: Mini Sonic	PROJECT NO: W14101068.033
Minto Mine, YT	6944482N; 384008.9E; Zone 8	ELEVATION: 848.8m

SAMPLE TYPE	<input type="checkbox"/> DISTURBED	<input type="checkbox"/> NO RECOVERY	<input type="checkbox"/> SPT	<input type="checkbox"/> A-CASING	<input type="checkbox"/> SHELBY TUBE	<input type="checkbox"/> CORE
BACKFILL TYPE	<input type="checkbox"/> BENTONITE	<input type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input type="checkbox"/> SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	USC	SOIL SYMBOL	GROUND ICE DESCRIPTION AND COMMENTS	SPT (N)		PLASTIC M.C. LIQUID		CLAY (%)		SILT (%)		SAND (%)		GRAVEL (%)		Elevation (m)
							20	40	20	40	20	40	20	40	20	40	20	40	
17						clear													831.0
18			G12			- Vx, 30% to 17.7 m													830.0
19						- ice lens 40 mm thick, clear													829.0
20			G13			- Vx, 5% to 19.0 m													828.0
21	- ICE and CLAY (TILL), 100 mm thick - becomes some gravel		G14			- ice lenses 50 mm thick at 500 mm spacing, 10% ice content													827.0
22																			826.0
23																			825.0
24			G16																824.0
25			G15																823.0
26	- becomes trace gravel, medium to high plastic		G17																822.0
27	- ICE and CLAY (TILL), 200 mm thick																		821.0
28			G18																820.0
29																			819.0
30			G19																818.0
31	- becomes low plastic		G20																817.0
32	- ICE and CLAY (TILL), 100 mm thick																		816.0
33	- ICE and CLAY (TILL), 500 mm thick		G21																815.0
34			G22			- ice lens 30 mm thick, white													815.0

	LOGGED BY: KAE	COMPLETION DEPTH: 65.5m
	REVIEWED BY: JGD	COMPLETE: 10/1/2011
	DRAWING NO:	Page 2 of 4



Fall 2011 Geotechnical Drilling		CLIENT: Minto Explorations Ltd.		BOREHOLE NO: 11-G18											
W15, Upper Minto Valley		DRILL: Mini Sonic		PROJECT NO: W14101068.033											
Minto Mine, YT		6944482N; 384008.9E; Zone 8		ELEVATION: 848.8m											
SAMPLE TYPE		<input type="checkbox"/> DISTURBED <input type="checkbox"/> NO RECOVERY <input type="checkbox"/> SPT <input type="checkbox"/> A-CASING <input type="checkbox"/> SHELBY TUBE <input type="checkbox"/> CORE													
BACKFILL TYPE		<input type="checkbox"/> BENTONITE <input type="checkbox"/> PEA GRAVEL <input type="checkbox"/> SLOUGH <input type="checkbox"/> GROUT <input type="checkbox"/> DRILL CUTTINGS <input type="checkbox"/> SAND													
Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	USC	SOIL SYMBOL	GROUND ICE DESCRIPTION AND COMMENTS	SALINITY (ppt)		CLAY (%)		SILT (%)		SAND (%)		Elevation (m)
							6	12	18	24	20	40	60	80	
								SPT (N)		PLASTIC M.C.		LIQUID			
								20	40	60	80	20	40	60	80
34			G23											814.0	
35						- ice lenses 20 mm thick at 500 mm spacing, clear to 37.7 m								813.0	
36														812.0	
37														811.0	
38	- becomes silty, sandy		G24				1							810.0	
39	- ICE and CLAY (TILL), 70 mm thick													810.0	
40	- becomes medium plastic		G25			- ice inclusion 20 mm diameter								809.0	
41	- cobble, 80 mm diameter		G26											808.0	
42														807.0	
43	- becomes very stiff		G27											806.0	
44			G28											805.0	
45			G29											804.0	
46	- clay seam, high plastic					- Nbe								803.0	
47	- sand seam, 50 mm thick, coarse		G30											802.0	
48	- becomes sandy, organic odor													801.0	
49	SAND - some gravel, some clay, trace silt, coarse, loose, grey, frozen		G31			- Nf								800.0	
50	CLAY (TILL) - silty, some sand, trace gravel, stiff, medium plastic, grey, frozen		G32	CI										799.0	
51	- ICE and CLAY (TILL), 300 mm thick		G33											798.0	
	- varved clay, grey and olive brown, medium to high plastic		G34											798.0	



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REVIEWED BY: JGD

DRAWING NO:

COMPLETION DEPTH: 65.5m

COMPLETE: 10/1/2011

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Fall 2011 Geotechnical Drilling	CLIENT: Minto Explorations Ltd.	BOREHOLE NO: 11-G18
W15, Upper Minto Valley	DRILL: Mini Sonic	PROJECT NO: W14101068.033
Minto Mine, YT	6944482N; 384008.9E; Zone 8	ELEVATION: 848.8m

SAMPLE TYPE	DISTURBED	NO RECOVERY	SPT	A-CASING	SHELBY TUBE	CORE
BACKFILL TYPE	BENTONITE	PEA GRAVEL	SLOUGH	GROUT	DRILL CUTTINGS	SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	USC	SOIL SYMBOL	GROUND ICE DESCRIPTION AND COMMENTS	SPT (N)		PLASTIC M.C. LIQUID		CLAY (%)		SILT (%)		SAND (%)		GRAVEL (%)		Elevation (m)
							6	12	18	24	20	40	60	80	20	40	60	80	
51	- becomes some gravel		G35																797.0
52			G36																796.0
53			G37			- sample likely frozen but thawed by drill action, likely Nbn													795.0
54																			794.0
55	SILT (TILL) - some sand, trace clay, trace gravel, damp, stiff, low to medium plastic, grey, likely frozen		G38			- sample likely frozen but thawed by drill action, likely Nbn													793.0
56																			792.0
57	CLAY (TILL) - silty, trace gravel, trace sand, damp, stiff, medium plastic, grey, frozen		G39	Cl		- sample likely frozen but thawed by drill action, likely Nbn													791.0
58																			790.0
59			G40																789.0
60			G41																788.0
61	SILT - sandy, firm, non plastic, dark grey, likely frozen		G42																787.0
62			G43																786.0
63	- becomes soft, organic odor																		785.0
64																			784.0
65			G44																783.0
66	END OF BOREHOLE @ 65.5 m (maximum depth of drill)																		782.0
67	NOTE: Modified USC Symbols shown where data available																		781.0
68																			

 A TETRA TECH COMPANY	LOGGED BY: KAE	COMPLETION DEPTH: 65.5m
	REVIEWED BY: JGD	COMPLETE: 10/1/2011
	DRAWING NO:	Page 4 of 4

Fall 2011 Geotechnical Drilling	CLIENT: Minto Explorations Ltd.	BOREHOLE NO: 11-G19
Pelly Laydown	DRILL: Mini Sonic	PROJECT NO: W14101068.033
Minto Mine, YT	6944875N; 383826E; Zone 8	ELEVATION: 862.3m

SAMPLE TYPE	DISTURBED	NO RECOVERY	SPT	A-CASING	SHELBY TUBE	CORE
BACKFILL TYPE	BENTONITE	PEA GRAVEL	SLOUGH	GROUT	DRILL CUTTINGS	SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	USC	SOIL SYMBOL	GROUND ICE DESCRIPTION AND COMMENTS	SPT (N)		PLASTIC M.C.		LIQUID		CLAY (%)		SILT (%)		SAND (%)		GRAVEL (%)		Elevation (m)
							6	12	18	24	20	40	60	80	20	40	60	80	20	40	
0	SAND (RESIDUUM FILL) - some gravel, some silt, trace cobbles, well graded, firm, reddish brown		G1																		862.0
1																					861.0
2																					860.0
3																					859.0
4																					858.0
5	ORGANICS - root inclusions																				857.0
5	SILT and SAND - some gravel, trace clay, wet, soft, low plastic, light brown		G2	SC																	857.0
6																					856.0
7	- becomes frozen		G3			- Nbn															855.0
8																					854.0
9	- ICE with SILT and SAND, 300 mm thick		G4																		853.0
10			G5			- Vx, 5% to 10.3 m															852.0
11	- becomes firm																				851.0
12	SILT (TILL) - sandy, some clay, trace gravel, very stiff, low to non-plastic, grey, frozen		G6																		850.0
13	- becomes firm, brown		G7			- ice inclusion, 20 mm thick															849.0
14	- sand seam, coarse, 200 mm thick		G8																		848.0
15																					847.0
16	- ICE and SILT, 30 mm thick																				846.0
16	- sand seam, coarse, 200 mm thick		G9																		846.0
16	- becomes some gravel																				846.0
17	- gravel seam, coarse, 500 mm thick		G10																		845.0
18			G11																		844.0
19			G12																		843.0
20						- ice lens, 30 mm thick															843.0
20	SAND - silty, some gravel, trace clay, stiff, coarse, stiff, grey, frozen		G13																		842.0
21			G14																		842.0
22			G15																		841.0
22	- ICE and SAND lens, 20 mm thick																				840.0
23	SAND - silty, some gravel, trace clay, stiff, well graded, grey,		G16																		840.0

 A TETRA TECH COMPANY	LOGGED BY: KAE	COMPLETION DEPTH: 65.5m
	REVIEWED BY: JGD	COMPLETE: 9/24/2011
	DRAWING NO:	Page 1 of 3

Fall 2011 Geotechnical Drilling	CLIENT: Minto Explorations Ltd.	BOREHOLE NO: 11-G19
Pelly Laydown	DRILL: Mini Sonic	PROJECT NO: W14101068.033
Minto Mine, YT	6944875N; 383826E; Zone 8	ELEVATION: 862.3m

SAMPLE TYPE	DISTURBED	NO RECOVERY	SPT	A-CASING	SHELBY TUBE	CORE
BACKFILL TYPE	BENTONITE	PEA GRAVEL	SLOUGH	GROUT	DRILL CUTTINGS	SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	USC	SOIL SYMBOL	GROUND ICE DESCRIPTION AND COMMENTS	SPT (N)		PLASTIC M.C. LIQUID		CLAY (%)		SILT (%)		SAND (%)		GRAVEL (%)		Elevation (m)
							6	12	18	24	20	40	60	80	20	40	60	80	
23	frozen																		839.0
24	- becomes very stiff, trace cobbles		G17	SC		- ice lens, 10 mm thick													838.0
25			G18																837.0
26			G19																836.0
27	- ICE and SILT lens, 20 mm thick		G20																835.0
28	CLAY (TILL) - silty, some gravel, trace sand, firm, plastic, grey, frozen																		834.0
29	- becomes trace gravel		G21			- ice inclusions, 10 mm thick by 300 mm spacing to 29.0 m, Vs, Vx <5%													833.0
30	SILT (TILL) - sandy, some gravel, trace clay, very stiff, low to non-plastic, dark grey, frozen		G22																832.0
31	CLAY (TILL) - silty, some gravel, trace sand, firm, plastic, grey, frozen		G23																831.0
32																			830.0
33	- silt (till) seam, 200 mm thick		G24																829.0
34																			828.0
35			G25																827.0
36			G26																826.0
37	SILT and SAND (TILL) - trace clay, trace gravel, very stiff, low to non-plastic, dark grey, frozen		G27	SC		- ice inclusion, 30 mm thick, clear													825.0
38	- ICE and SILT inclusion, 50 mm thick		G28																824.0
39			G30																823.0
40			G29			- ice lens, 120 mm thick, clear													822.0
41	CLAY (TILL) - silty, trace sand, trace gravel, firm, low to medium plastic, frozen		G31			- ice lens, 3 mm thick, clear													821.0
42	- becomes low to medium plastic		G32			- ice inclusion, 40 mm thick, clear													820.0
43	- becomes stiff		G33																819.0
44			G34																818.0
45	SILT (TILL) - sandy, some gravel, trace clay, very stiff, low to non-plastic, dark grey, frozen		G35			- Nbn													817.0
46	CLAY (TILL) - silty, some sand, trace gravel, stiff, low to medium plastic, dark grey, frozen		G36 G37																817.0

 A TETRA TECH COMPANY	LOGGED BY: KAE	COMPLETION DEPTH: 65.5m
	REVIEWED BY: JGD	COMPLETE: 9/24/2011
	DRAWING NO:	Page 2 of 3

Fall 2011 Geotechnical Drilling		CLIENT: Minto Explorations Ltd.		BOREHOLE NO: 11-G19					
Pelly Laydown		DRILL: Mini Sonic		PROJECT NO: W14101068.033					
Minto Mine, YT		6944875N; 383826E; Zone 8		ELEVATION: 862.3m					
SAMPLE TYPE		■ DISTURBED	□ NO RECOVERY	⊗ SPT	▨ A-CASING	▨ SHELBY TUBE	■ CORE		
BACKFILL TYPE		■ BENTONITE	● PEA GRAVEL	▨ SLOUGH	○ GROUT	▨ DRILL CUTTINGS	● SAND		
Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	USC	SOIL SYMBOL	GROUND ICE DESCRIPTION AND COMMENTS	◇ SALINITY (ppt) ◇	◆ CLAY (%) ◆	Elevation (m)
							6 12 18 24	20 40 60 80	
							■ SPT (N) ■	● SILT (%) ●	
							20 40 60 80	20 40 60 80	
							PLASTIC M.C. LIQUID		
							20 40 60 80	20 40 60 80	
							▲ SAND (%) ▲		
							■ GRAVEL (%) ■		
							20 40 60 80		
46									816.0
47	- becomes sandy		G38						815.0
	- sand seam, coarse		G39						
48	- clay seam, trace sand, high plastic		G40						814.0
	- sand seam, coarse								
49									813.0
50									812.0
51	- boulder		G41						811.0
52	SILT (TILL) - sandy, some gravel, trace clay, very stiff, medium plastic, dark grey, frozen								810.0
53									809.0
54			G42						808.0
55									807.0
56									806.0
57									805.0
58	- becomes trace gravel		G43						804.0
59	- becomes some gravel								803.0
	- becomes gravelly								
60	- becomes trace cobbles		G44						802.0
61									801.0
62	CLAY (TILL) - some sand, some silt, trace gravel, stiff, medium to high plastic, brown, frozen		G45						800.0
63	SILT (TILL) - sandy, some gravel, trace clay, very stiff, low to medium plastic, dark grey, some oxidization staining, frozen		G46						799.0
64									798.0
65	SAND - some clay, trace gravel, well graded, moist, loose, brown to reddish brown, frozen								797.0
	- becomes silty, trace clay		G47						
66	END OF BOREHOLE @ 65.5 m (maximum depth of drill)								796.0
	NOTE: Modified USC Symbols shown where data available								795.0
67									794.0
68									793.0
69									792.0

Fall 2011 Geotechnical Drilling	CLIENT: Minto Explorations Ltd.	BOREHOLE NO: 11-G15
Southwest Dump	DRILL: Mini Sonic	PROJECT NO: W14101068.033
Minto Mine, YT	6944235N; 383762.8E; Zone 8	ELEVATION: 869.5m

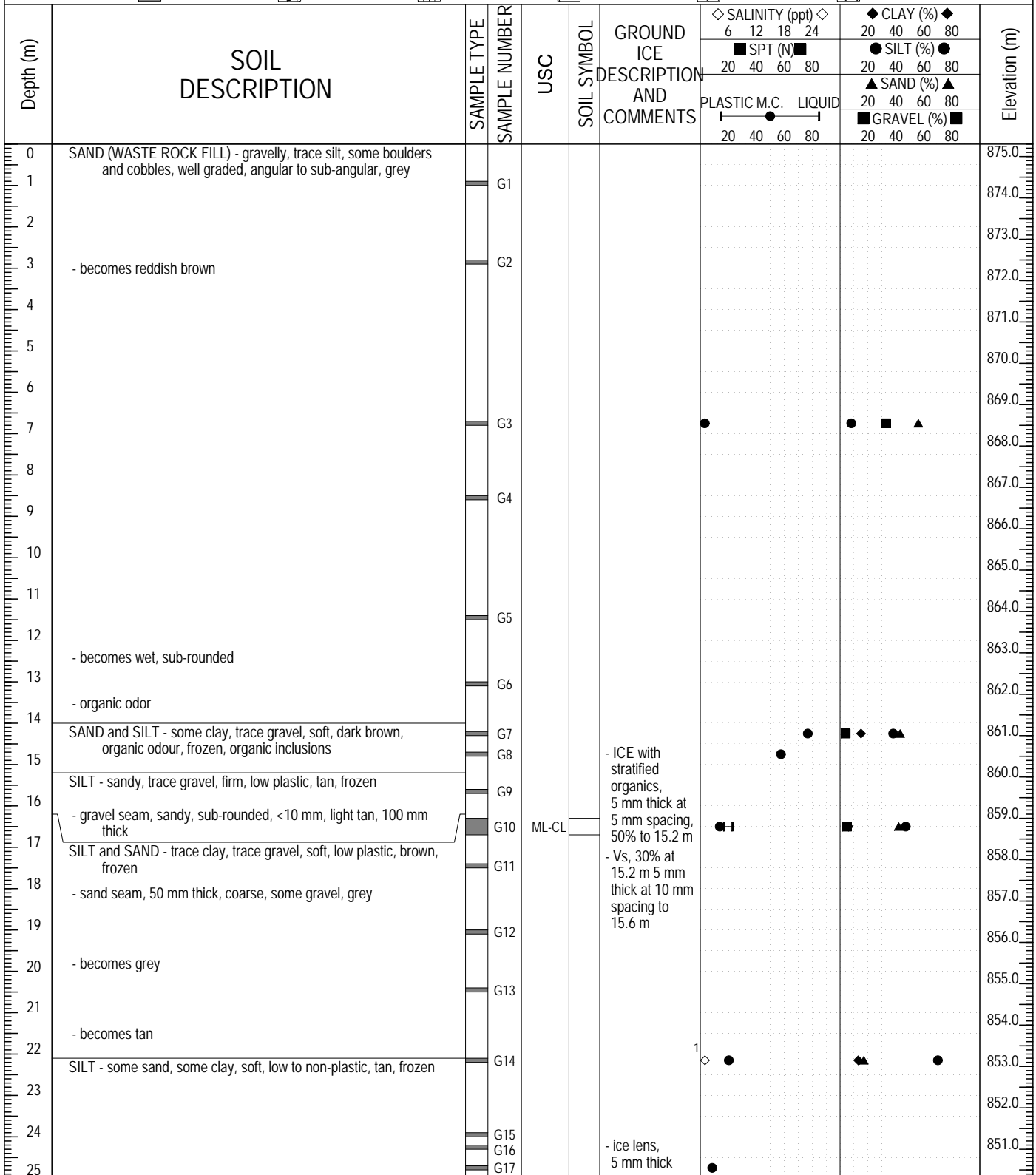
SAMPLE TYPE	DISTURBED	NO RECOVERY	SPT	A-CASING	SHELBY TUBE	CORE
BACKFILL TYPE	BENTONITE	PEA GRAVEL	SLOUGH	GROUT	DRILL CUTTINGS	SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	USC	SOIL SYMBOL	GROUND ICE DESCRIPTION AND COMMENTS	SPT (N)		PLASTIC M.C.		LIQUID		CLAY (%)		SILT (%)		SAND (%)		GRAVEL (%)		Elevation (m)
							6	12	18	24	20	40	60	80	20	40	60	80	20	40	
42			G32																		827.0
43	- organic silt seam, sandy, trace clay, very stiff, low to non plastic, dark brown, organic odor		G33																		826.0
44	- becomes trace gravel, low plastic		G34																		825.0
45			G35																		824.0
46	- becomes some clay, some sand, some gravel, low to medium plastic, dark grey, faint organic odour, frozen		G36			- ice lens 5 mm thick, Nbn following															823.0
47	- clay seam, firm high plastic, dark grey, frozen																				822.0
48	- some cobbles																				821.0
49	- becomes gravelly		G37																		820.0
50	- gravel seam		G38																		819.0
51	SILT (LACUSTRINE) - trace sand, trace clay, stiff, medium plastic, dark grey, frozen																				818.0
52	- becomes some gravel		G39			- sample likely frozen but thawed by drill action															817.0
53	SAND - silty, trace gravel, trace clay, well graded, stiff, dark grey, likely frozen		G40			- Vx, 30%															816.0
54	- becomes trace clay																				815.0
55	- frequent sand seams		G41			- Vx, 35% within sand seams															814.0
56	- becomes tan in color		G42																		813.0
57	- becomes gravelly, some oxidazation staining																				812.0
58	SAND AND GRAVEL (RESIDUUM) - some silt, well graded sand, gravel <25 mm, rust brown, likely frozen		G43			- sample likely frozen but thawed by drill action, likely Nbn or Nf															811.0
59	WEATHERED BEDROCK - highly fractured, weak																				810.0
60	END OF BOREHOLE @ 57.9 m (confirmed depth to bedrock)																				809.0
61	NOTE: Modified USC Symbols shown where data available																				808.0
62																					807.0
63																					

 A TETRA TECH COMPANY	LOGGED BY: KAE	COMPLETION DEPTH: 57.9m
	REVIEWED BY: JGD	COMPLETE: 9/19/2011
	DRAWING NO:	Page 3 of 3

Fall 2011 Geotechnical Drilling	CLIENT: Minto Explorations Ltd.	BOREHOLE NO: 11-G20
Southwest Dump	DRILL: Mini Sonic	PROJECT NO: W14101068.033
Minto Mine, YT	6944312N; 383721.7E; Zone 8	ELEVATION: 875.3m

SAMPLE TYPE	DISTURBED	NO RECOVERY	SPT	A-CASING	SHELBY TUBE	CORE
BACKFILL TYPE	BENTONITE	PEA GRAVEL	SLOUGH	GROUT	DRILL CUTTINGS	SAND



 A TETRA TECH COMPANY	LOGGED BY: KAE	COMPLETION DEPTH: 45.7m
	REVIEWED BY: JGD	COMPLETE: 9/28/2011
	DRAWING NO:	Page 1 of 2

Fall 2011 Geotechnical Drilling	CLIENT: Minto Explorations Ltd.	BOREHOLE NO: 11-G20
Southwest Dump	DRILL: Mini Sonic	PROJECT NO: W14101068.033
Minto Mine, YT	6944312N; 383721.7E; Zone 8	ELEVATION: 875.3m

SAMPLE TYPE	DISTURBED	NO RECOVERY	SPT	A-CASING	SHELBY TUBE	CORE
BACKFILL TYPE	BENTONITE	PEA GRAVEL	SLOUGH	GROUT	DRILL CUTTINGS	SAND

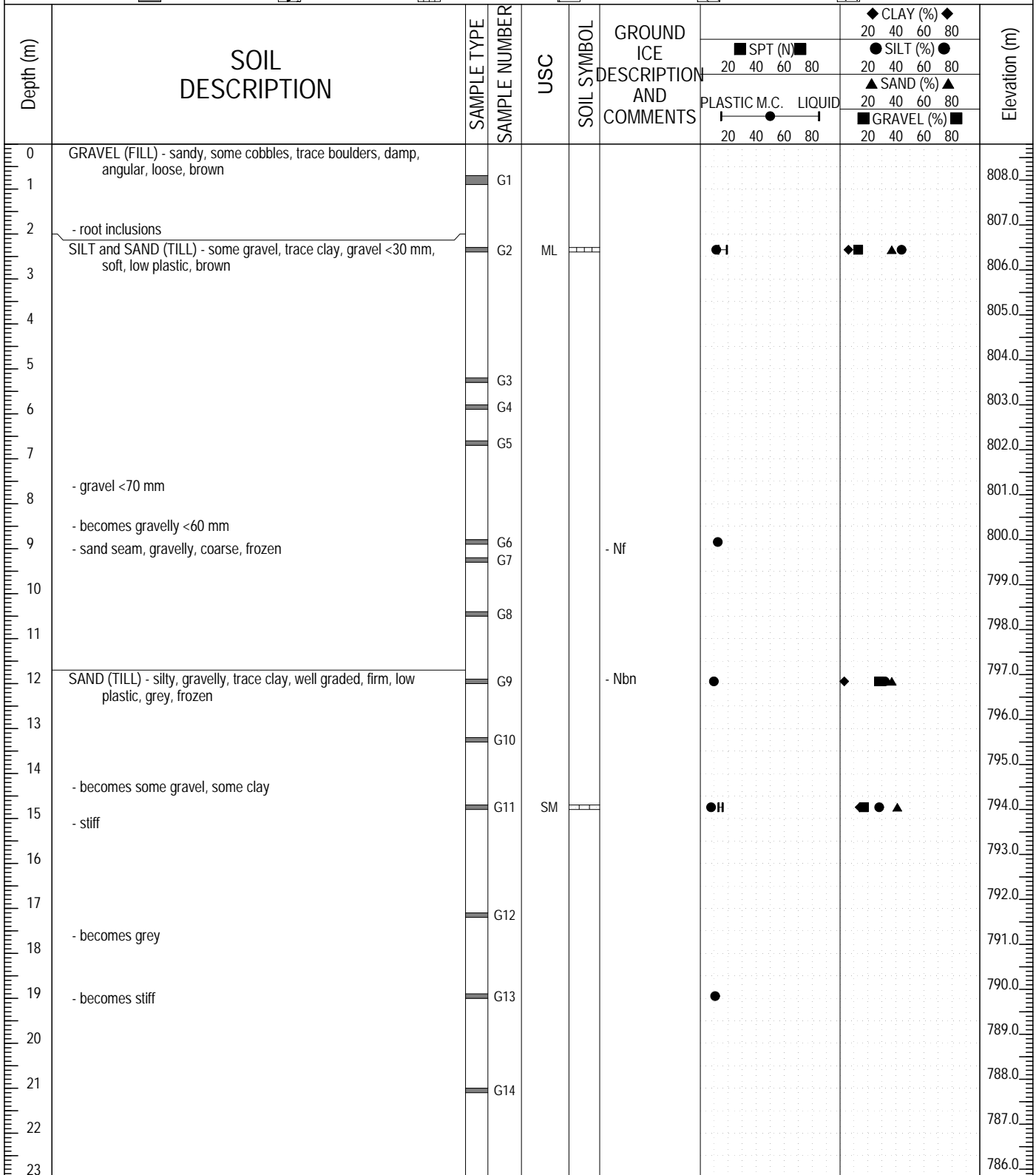
Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	USC	SOIL SYMBOL	GROUND ICE DESCRIPTION AND COMMENTS	SALINITY (ppt)		CLAY (%)		SILT (%)		SAND (%)		Elevation (m)
							6	12	18	24	20	40	60	80	
25						- ice inclusions, 10 mm thick								850.0	
26	- cobble													849.0	
27	- becomes some gravel		G18											848.0	
28						- ice lenses 30 mm thick at 400 mm spacing to 29.4 m, 5-10% ice content								847.0	
29			G19											846.0	
30			G20											845.0	
31	SAND and SILT (TILL) - some gravel, some cobbles, trace clay, stiff, low plastic, brown, frozen		G21			- ice lens, 70 mm thick, clear								844.0	
32	- boulder					- ice lenses, 30 mm thick at 300 mm spacing to 33.5 m, 10% ice content								843.0	
33			G22	SM										842.0	
34			G23											841.0	
35	- cobble 200 mm					- Vs, 20 m thick at 50 mm spacing, ice lenses up to 50 mm thick, 30 % ice content to 37.0 m								840.0	
36			G24											839.0	
37			G25											838.0	
38	SAND (TILL) - silty, some gravel, stiff, brown, frozen		G26											837.0	
39														836.0	
40	- cobble 100 mm													835.0	
41	- becomes gravelly													834.0	
42	- gravel seam		G27											833.0	
43	- gravelly, some weathered rock		G28											832.0	
44	SAND and GRAVEL (RESIDUUM) - some silt, some cobbles, coarse grained, tan		G29											831.0	
45	- oxidization staining													830.0	
46	WEATHERED BEDROCK - estimated weak, pulverized by drill		G30											829.0	
47	END OF BOREHOLE @ 45.7 m (likely bedrock, drilling stopped due to slow, hard drilling and poor sample recovery)													828.0	
48	NOTE: Modified USC Symbols shown where data available													827.0	
49														826.0	
50														825.0	

 A TETRA TECH COMPANY	LOGGED BY: KAE	COMPLETION DEPTH: 45.7m
	REVIEWED BY: JGD	COMPLETE: 9/28/2011
	DRAWING NO:	Page 2 of 2



Fall 2011 Geotechnical Drilling	CLIENT: Minto Explorations Ltd.	BOREHOLE NO: 11-G23
Boulder Laydown	DRILL: Mini Sonic	PROJECT NO: W14101068.033
Minto Mine, YT	6944838N; 384839.6E; Zone 8	ELEVATION: 808.8m

SAMPLE TYPE	DISTURBED	NO RECOVERY	SPT	A-CASING	SHELBY TUBE	CORE
BACKFILL TYPE	BENTONITE	PEA GRAVEL	SLOUGH	GROUT	DRILL CUTTINGS	SAND



 eba A TETRA TECH COMPANY	LOGGED BY: KAE	COMPLETION DEPTH: 65.5m
	REVIEWED BY: JGD	COMPLETE: 9/30/2011
	DRAWING NO:	Page 1 of 3

Fall 2011 Geotechnical Drilling		CLIENT: Minto Explorations Ltd.		BOREHOLE NO: 11-G23						
Boulder Laydown		DRILL: Mini Sonic		PROJECT NO: W14101068.033						
Minto Mine, YT		6944838N; 384839.6E; Zone 8		ELEVATION: 808.8m						
SAMPLE TYPE		DISTURBED	NO RECOVERY	SPT	A-CASING	SHELBY TUBE	CORE			
BACKFILL TYPE		BENTONITE	PEA GRAVEL	SLOUGH	GROUT	DRILL CUTTINGS	SAND			
Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	USC	SOIL SYMBOL	GROUND ICE DESCRIPTION AND COMMENTS	PLASTIC M.C. LIQUID		Elevation (m)	
							SPT (N)	CLAY (%)		SILT (%)
23			G15						785.0	
24										
25	CLAY (TILL) - silty, some gravel, trace sand, firm, likely low to medium plastic, dark grey		G16			- Vx, 5 %				784.0
26										783.0
27										782.0
28	- gravel seam <30 mm, oxidization staining SILT - sandy, trace gravel, trace clay, very wet, soft, low to non-plastic, tan		G17			- sample likely frozen but thawed from drill action, likely Nbe				781.0
29										780.0
30	SAND and SILT - trace gravel, trace clay, reddish brown		G18			- ice lens, 10 mm thick, clear				779.0
31	GRAVEL - some sand, some silt, occasional cobbles, gravel <30 mm, subrounded, loose, tan		G19							778.0
32	- becomes grey									777.0
33	SILT and SAND (TILL) - trace clay, trace gravel, stiff, non-plastic, dark grey, frozen		G20	ML						776.0
34										775.0
35			G21							774.0
36						- Vx, 5% to 35.5 m				773.0
37						- Vx, 10% to 37.7 m				772.0
38										771.0
39	CLAY (TILL) - silty, sandy, trace gravel, firm, medium plastic, dark grey, frozen		G23			- Vx, 5%				770.0
40			G24	Cl		- Vx, 10% to 41.0 m				769.0
41						- ice lens, 10 mm thick, white				768.0
42			G25			- Nbn				767.0
43	- varved clay, grey and beige		G26							766.0
44										765.0
45										764.0
46	- sand seam, coarse, grey, 50 mm thick - becomes beige									763.0




LOGGED BY: KAE	COMPLETION DEPTH: 65.5m
REVIEWED BY: JGD	COMPLETE: 9/30/2011
DRAWING NO:	Page 2 of 3

Fall 2011 Geotechnical Drilling	CLIENT: Minto Explorations Ltd.	BOREHOLE NO: 11-G23
Boulder Laydown	DRILL: Mini Sonic	PROJECT NO: W14101068.033
Minto Mine, YT	6944838N; 384839.6E; Zone 8	ELEVATION: 808.8m

SAMPLE TYPE	<input type="checkbox"/> DISTURBED	<input type="checkbox"/> NO RECOVERY	<input type="checkbox"/> SPT	<input type="checkbox"/> A-CASING	<input type="checkbox"/> SHELBY TUBE	<input type="checkbox"/> CORE
BACKFILL TYPE	<input type="checkbox"/> BENTONITE	<input type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input type="checkbox"/> SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	USC	SOIL SYMBOL	GROUND ICE DESCRIPTION AND COMMENTS	SPT (N)		PLASTIC M.C.		LIQUID		Elevation (m)
							20	40	60	80	20	40	
46												762.0	
47	- becomes stiffer		G27									761.0	
48												760.0	
49			G28									759.0	
50												758.0	
51												757.0	
52	- trace gravel, grey											756.0	
53			G29									755.0	
54												754.0	
55	- cobble 150 mm thick - becomes some gravel, some silt											753.0	
56			G30									752.0	
57						- sample likely frozen but thawed from drill action, likely Nbn						751.0	
58			G31				●			■ ◆ ▲ ●		750.0	
59			G32									749.0	
60	- boulder											748.0	
61												747.0	
62			G33			- sample likely frozen but thawed from drill action, likely Nbn	●			■ ◆ ▲ ●		746.0	
63												745.0	
64	- cobble 75 mm thick - becomes silty - sample could not be retrieved, no recovery		G34									744.0	
65												743.0	
66	END OF BOREHOLE @ 65.5 m (maximum depth of drill)											742.0	
67	NOTE: Modified USC Symbols shown where data available.											741.0	
68												740.0	

	LOGGED BY: KAE	COMPLETION DEPTH: 65.5m
	REVIEWED BY: JGD	COMPLETE: 9/30/2011
	DRAWING NO:	Page 3 of 3

Fall 2011 Geotechnical Drilling	CLIENT: Minto Explorations Ltd.	BOREHOLE NO: 11-G22
W37, Lower Minto Valley	DRILL: Mini Sonic	PROJECT NO: W14101068.033
Minto Mine, YT	6945176N; 385893E; Zone 8	ELEVATION: 730.1m

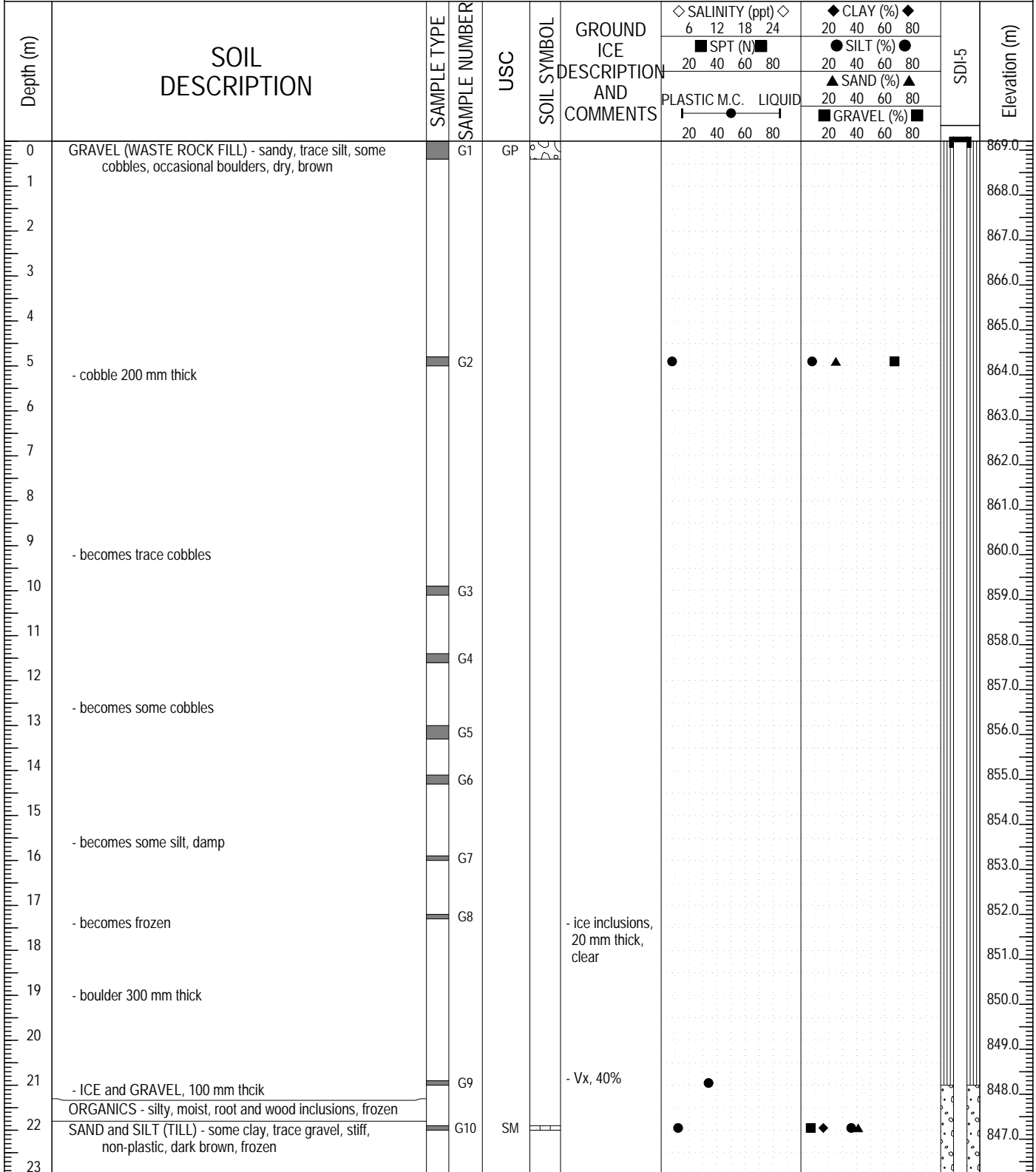
SAMPLE TYPE	DISTURBED	NO RECOVERY	SPT	A-CASING	SHELBY TUBE	CORE
BACKFILL TYPE	BENTONITE	PEA GRAVEL	SLOUGH	GROUT	DRILL CUTTINGS	SAND


Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	USC	SOIL SYMBOL	GROUND ICE DESCRIPTION AND COMMENTS	SPT (N)		PLASTIC M.C.		LIQUID		Elevation (m)
							20	40	60	80	20	40	
0	SAND and GRAVEL (RESIDUUM FILL) - trace organics, well graded sand, gravel <30 mm, sub-angular, wet, loose, brown, slight organic odor		G1									730.0	
1	SAND and SILT (TILL) - some clay, some gravel, low plastic, brown, frozen					- Vx, 15%						729.0	
2												728.0	
3	SAND (TILL) - silty, trace clay, trace gravel, frozen, organic odour and inclusions		G2	SM		- Nbe						727.0	
4	- cobbles <200 mm diameter, some high plastic clay within voids of cobbles		G3									726.0	
5	SAND (TILL) - gravelly, some silt, trace clay, well graded, moist, brown, frozen		G4									725.0	
6	SAND and GRAVEL (RESIDUUM) - trace clay, well graded sand, gravel <30 mm, loose, brown to reddish brown, frozen					- Nf						724.0	
7	BEDROCK - highly weathered, estimated weak, pulverized by drill, reddish brown		G5									723.0	
8	- cobble in BIR		G6									722.0	
9			G7									721.0	
10			G8									720.0	
11	END OF BOREHOLE @ 10.7 m (confirmed depth to bedrock) NOTE: Modified USC Symbols shown where data available											719.0	

 A TETRA TECH COMPANY	LOGGED BY: KAE	COMPLETION DEPTH: 10.7m
	REVIEWED BY: JGD	COMPLETE: 9/30/2011
	DRAWING NO:	Page 1 of 1

Fall 2011 Geotechnical Drilling	CLIENT: Minto Explorations Ltd.	BOREHOLE NO: SDI-5
Southwest Dump	DRILL: Mini Sonic	PROJECT NO: W14101068.033
Minto Mine, YT	6944582N; 383895E; Zone 8	ELEVATION: 869.2m

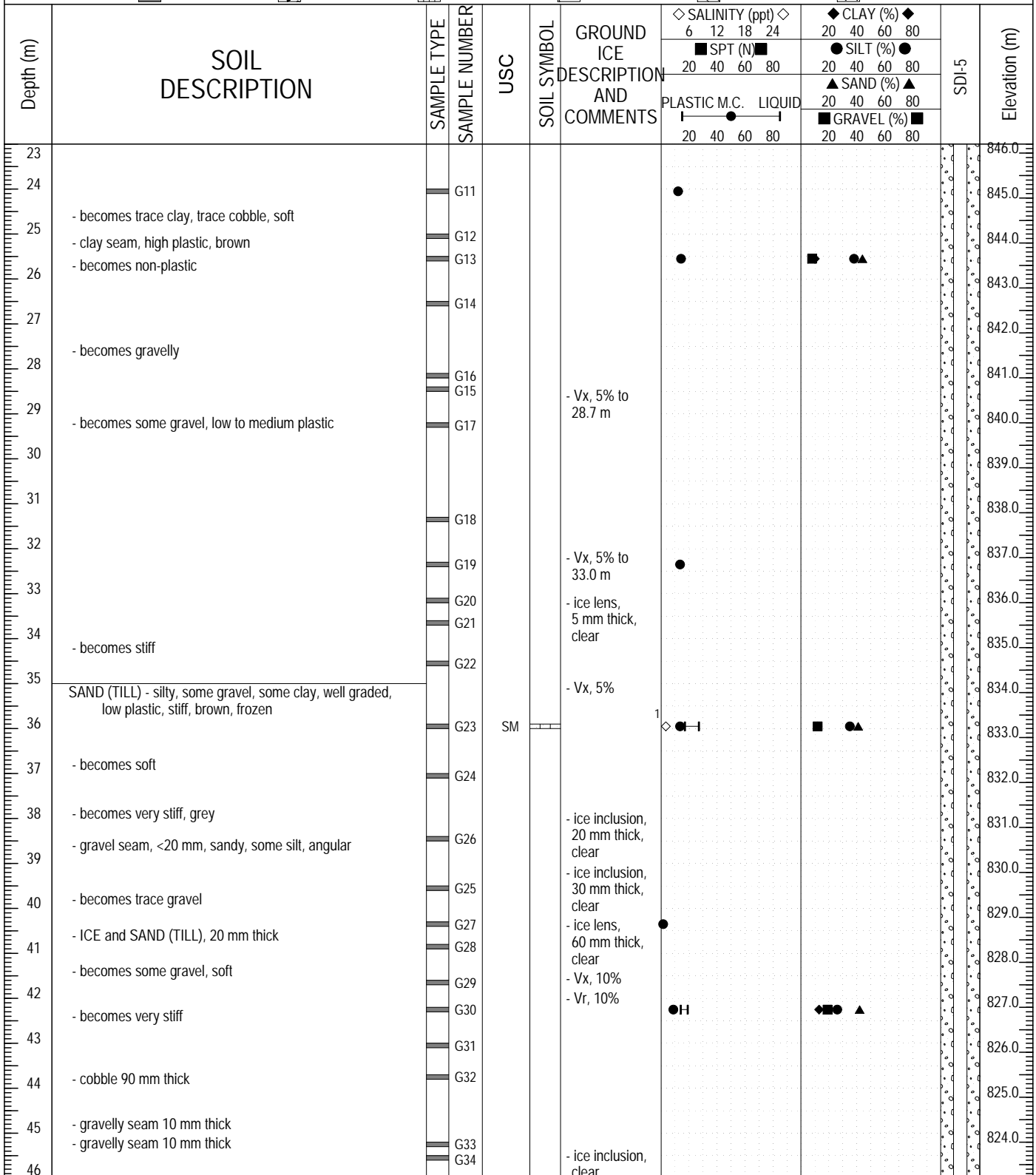
SAMPLE TYPE	<input type="checkbox"/> DISTURBED	<input type="checkbox"/> NO RECOVERY	<input checked="" type="checkbox"/> SPT	<input type="checkbox"/> A-CASING	<input type="checkbox"/> SHELBY TUBE	<input type="checkbox"/> CORE
BACKFILL TYPE	<input type="checkbox"/> BENTONITE	<input type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input type="checkbox"/> SAND



	LOGGED BY: KAE	COMPLETION DEPTH: 61m
	REVIEWED BY: JGD	COMPLETE: 9/21/2011
	DRAWING NO:	Page 1 of 3

Fall 2011 Geotechnical Drilling	CLIENT: Minto Explorations Ltd.	BOREHOLE NO: SDI-5
Southwest Dump	DRILL: Mini Sonic	PROJECT NO: W14101068.033
Minto Mine, YT	6944582N; 383895E; Zone 8	ELEVATION: 869.2m

SAMPLE TYPE	<input type="checkbox"/> DISTURBED	<input type="checkbox"/> NO RECOVERY	<input type="checkbox"/> SPT	<input type="checkbox"/> A-CASING	<input type="checkbox"/> SHELBY TUBE	<input type="checkbox"/> CORE
BACKFILL TYPE	<input type="checkbox"/> BENTONITE	<input type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input type="checkbox"/> SAND




	LOGGED BY: KAE	COMPLETION DEPTH: 61m
	REVIEWED BY: JGD	COMPLETE: 9/21/2011
	DRAWING NO:	Page 2 of 3

Fall 2011 Geotechnical Drilling	CLIENT: Minto Explorations Ltd.	BOREHOLE NO: SDI-5
Southwest Dump	DRILL: Mini Sonic	PROJECT NO: W14101068.033
Minto Mine, YT	6944582N; 383895E; Zone 8	ELEVATION: 869.2m

SAMPLE TYPE	<input checked="" type="checkbox"/> DISTURBED	<input type="checkbox"/> NO RECOVERY	<input checked="" type="checkbox"/> SPT	<input type="checkbox"/> A-CASING	<input type="checkbox"/> SHELBY TUBE	<input type="checkbox"/> CORE
BACKFILL TYPE	<input checked="" type="checkbox"/> BENTONITE	<input type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input type="checkbox"/> SAND

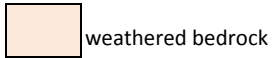
Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	USC	SOIL SYMBOL	GROUND ICE DESCRIPTION AND COMMENTS	SPT (N)		PLASTIC M.C.		LIQUID		SDI-5	Elevation (m)
							6	12	18	24	20	40		
46													823.0	
47			G35										822.0	
48			G36										821.0	
49			G37										820.0	
50	- becomes trace gravel, coarse sand		G38				●						819.0	
51	- sample thawing from drilling action, switched to 5 ft runs												818.0	
52			G39										817.0	
53			G40										816.0	
54	- becomes well graded		G41										815.0	
55	- becomes reddish brown, some oxidization												814.0	
56	- sample liquified, likely due to drilling action and excess drilling fluid, possibly melted ice, hard drilling at this depth		G42 G43										813.0	
57	- becomes tan												812.0	
58	SAND (RESIDUUM) - gravelly, trace silt, coarse grained, angular, oxide stained, heavily weathered, broken down with drilling action		G44										811.0	
59	WEATHERED BEDROCK - estimated weak												810.0	
60													809.0	
61	END OF BOREHOLE @ 61.0 m (Confirmed Bedrock)												808.0	
62	NOTE: installed SDI-5, backfilled with grout to original ground, slough to surface of waste rock; azimuth of A <sup>1</sup> direction is 41°												807.0	
63	Modified USC Symbols shown where data available												806.0	
64													805.0	
65													804.0	
66													803.0	
67													802.0	
68													801.0	
69														

	LOGGED BY: KAE	COMPLETION DEPTH: 61m
	REVIEWED BY: JGD	COMPLETE: 9/21/2011
	DRAWING NO:	Page 3 of 3

# MW09-1



overburden



weathered bedrock



fresh bedrock

## Geotechnical log (basic+)

\* 10ft rods were used, with 5ft core barrel,  
HQ3 bit, with split tubes; casing depth 10ft

Run #	Run Interval				TCR					IRS		comment
	From	To	From	To	ft	inches	decimal ft	m	%	strong	weak	
	ft	ft	m	m								
1	10	15	3.05	4.57	1.5		1.50	0.46	30			
2	15	20	4.57	6.10	2		2.00	0.61	40			
3	20	25	6.10	7.62	3	2	3.17	0.97	63		S2	
4	25	30	7.62	9.14	1.5		1.50	0.46	30		S3	diamicton material (possibly reworked till)
5	30	35	9.14	10.67	1		1.00	0.30	20			
6	35	40	10.67	12.19	1	3	1.25	0.38	25			
7	40	45	12.19	13.72		8	0.67	0.20	13			
8	45	50	13.72	15.24	0		0.00	0.00	0			
9	50	55	15.24	16.76	1	9	1.75	0.53	35			
10	55	60	16.76	18.29	2	10	2.83	0.86	57		S1	
11	60	65	18.29	19.81		5	0.42	0.13	8			
12	65	70	19.81	21.34		5	0.42	0.13	8			
13	70	75	21.34	22.86	1		1.00	0.30	20			
14	75	77.5	22.86	23.62	4.5		4.50	1.37	180			sluff from drilling (c.sand), not actual recovery
15	77.5	85	23.62	25.91	2.5		2.50	0.76	33			overburden bottom

Run #	Run Interval				TCR					OF	J	CJ	+J from RZ	RQD		IRS		micro def. 0 to 3	J - properties	comment
	From	To	From	To	ft	inches	decimal ft	m	%					cm	%	strong	weak			
	ft	ft	m	m																
16	85	88	25.91	26.82	3.5		3.50	1.07	117	10	10		0.70	66%	R3			rusty colour fill + clay, J surface rough undulating	weathered bedrock, jointed, altered near joints and stained, but fresh away from joints, high FF	
18	88	97	26.82	29.57	3	6	3.50	1.07	39					65%	R3				poor recovery	
19	97	100	29.57	30.48	3		3.00	0.91	100	10	10		0.56	61%	R3					
20	100	105	30.48	32.00	5		5.00	1.52	100	7	6			90%	R4	RO		at 104.6ft v.weathered near Js, R0 near Js, clay in Js, orange colour		
21	105	110	32.00	33.53	5		5.00	1.52	100	8	7	1		90%	R4			same as above		
22	110	115	33.53	35.05	5		5.00	1.52	100	18	14	3	1.20	79%	R4	RO		same as above	10 cm R0 zone at 112.5ft	
23	115	120	35.05	36.58	5		5.00	1.52	100	11	7			60%	R4			same as above	Qz vein present	
24	120	125	36.58	38.10	5		5.00	1.52	100	8	7		1.40	92%	R4			high weathering at 3 J's; other Js only stained rusty or black	felsic dike present at 120.3ft	
25	125	130	38.10	39.62	5		5.00	1.52	100	7	5		1.45	95%	R4			rusty stained Js		
26	130	135	39.62	41.15	5		5.00	1.52	100	12	12		1.25	82%	R4			rusty stained Js		
27	135	140	41.15	42.67	5		5.00	1.52	100	7	5		1.47	96%	R4			rusty stained Js, or weathered Js		
28	140	145	42.67	44.20	4	9	4.75	1.45	95	8	5			100%	R4			black or rusty staining on Js		
29	145	150	44.20	45.72	5		5.00	1.52	100	6	4	2	1.35	89%	R4			black staining on Js	pink alteration colour at 148ft	
30	150	155	45.72	47.24	5		5.00	1.52	100	7	6	2	1.40	92%	R4			clean J walls, no weathering		
31	155	160	47.24	48.77	5		5.00	1.52	100	8	7		1.25	82%	R4			rusty/black stained Js, some weathered J walls		
32	160	165	48.77	50.29	5		5.00	1.52	100	4				100%	R4			rusty/black staining	EOH	



# MW09-1

## Overburden Properties

\* core runs with the same properties were combined

Domain interval				description	permafrost	samples	clay plasticity	clay hardness	
From	To	From	To					description (as found)	ISRM code
ft	ft	m	m						
10	25	3.05	7.62	artificial fill of cobbles, boulders, gravel, soil/reworked till	core hot from drilling, cannot determine ice presence in this borehole			soft	S2
25	30	7.62	9.14	fill: brown moist clayey sand (f-c), with f.gravel (angular) + c.gravel pieces, crumbly		S1 at 29.5ft			
30	55	9.14	16.76	fill: cobbles, boulders, gravel (voids found during drilling), fine gr. materials washed out if present			medium to low	very soft (reworked by drilling process)	S1
55	60	16.76	18.29	grey moist/wet diamict with silty clay matrix, containing angular to sub-round gravel, broken sharp rock pieces, and coarse sand		S2 at 59.5 ft	medium to low	very soft (reworked by drilling process)	S1
65	70	19.81	21.34	grey/white wet clean sub round to ang fine gravel					
70	75	21.34	22.86	sandy clay and grey wet clayey f-med sand with f-c gravel, sub ang to round			low	very soft (reworked by drilling process)	S1
75	85	22.86	25.91	m. gravel, rounded to sub ang, trace silt/clay (washed out)					

### clay hardness - quantitative measurements

Tor Vane (* 0.1 kg/cm <sup>2</sup> )	Penetrometer (kg/cm <sup>2</sup> )	Tor Vane (MPa)	Penetrometer (MPa)
1.1		0.01	
1.1		0.01	
0.8		0.01	

### ISRM Standard - Field Estimate of Rock Strength

Index	Description	Field Test	~ UCS (MPa)
<b>S1</b>	Very Soft Clay	Easily penetrated by fist (flows between fingers)	< 0.025
<b>S2</b>	Soft Clay	Easily penetrated by thumb (>1")	0.025 - 0.05
<b>S3</b>	Firm Clay	Penetrated by thumb with moderate effort (>1")	0.05 - 0.10
<b>S4</b>	Stiff Clay	Indented by thumb but penetrated with great effort	0.10 - 0.25
<b>S5</b>	Very Stiff Clay	Readily indented with thumbnail	0.25 - 0.50
<b>S6</b>	Hard Clay	Indented with difficulty by thumbnail	> 0.50
<b>R0</b>	Extremely Weak	indented by thumbnail, crumbles under soft blow of blunt end of hammer; breaks apart when crushed by fingers	0.25 - 1.0
<b>R1</b>	Very Weak	crumbles under firm blow of geologic hammer pick; peeled by knife	1.0 - 5.0
<b>R2</b>	Weak	shallow indentation under firm blow of pick end of geologic hammer	5.0 - 25
<b>R3</b>	Medium Strong	fractured with single firm blow of geologic hammer	25 - 50
<b>R4</b>	Strong	requires more than one blow of hammer to fracture	50 - 100
<b>R5</b>	Very Strong	requires many blows of hammer to fracture	100 - 250
<b>R6</b>	Extremely Strong	can only be chipped with strong blows of hammer	> 250



overburden



weathered bedrock



fresh bedrock

Geotechnical log (basic+)

\* 10ft rods were used, with 5ft core barrel,  
HQ3 bit, with split tubes; casing depth 10ft

Run #	Run Interval				TCR					OF	J	CJ	+J from RZ	RQD		IRS		micro def.	J - properties	comment
	From	To	From	To	ft	inches	decimal ft	m	%					cm	%	strong	weak			
	ft	ft	m	m																
1	10	15	3.05	4.57	1.5		1.50	0.46	30					0%						
2	15	17	4.57	5.18	2	6	2.50	0.76	125					0%						
3	17	25	5.18	7.62	5	3	5.25	1.60	66					0%	S4					
4	25	30	7.62	9.14	5		5.00	1.52	100					0%						
5	30	35	9.14	10.67	5		5.00	1.52	100					0%	S5					
6	35	40	10.67	12.19	4	10	4.83	1.47	97					0%	S4					
7	40	45	12.19	13.72	5		5.00	1.52	100					0%	S4					
8	45	50	13.72	15.24	5	2	5.17	1.57	103					0%	S4					
9	50	55	15.24	16.76	5		5.00	1.52	100					0%	S4					
10	55	60	16.76	18.29	5		5.00	1.52	100					0%	S4					
11	60	65	18.29	19.81	5		5.00	1.52	100					0%	S4					
12	65	70	19.81	21.34	5		5.00	1.52	100					0%	S5					
13	70	75	21.34	22.86	4		4.00	1.22	80					0%	S5					
14	75	80	22.86	24.38	5		5.00	1.52	100					0%	S5					
15	80	85	24.38	25.91	5		5.00	1.52	100					0%	S5					
16	85	90	25.91	27.43	3.5		3.50	1.07	70					0%	S5					
18	90	95	27.43	28.96	5		5.00	1.52	100					0%	S5					
19	95	100	28.96	30.48	2	3	2.25	0.69	45					0%	S5					
20	100	105	30.48	32.00	5		5.00	1.52	100					0%	S5					
21	105	110	32.00	33.53	3.5		3.50	1.07	70					0%	S5					
22	110	115	33.53	35.05	0		0.00	0.00	0						S5					
23	115	120	35.05	36.58	5		5.00	1.52	100					0%	S5					
24	120	125	36.58	38.10	5		5.00	1.52	100					0%	S3					
25	125	130	38.10	39.62	5	2	5.17	1.57	103					0%	S3					
26	130	135	39.62	41.15	5		5.00	1.52	100					0%	S4					
27	135	140	41.15	42.67	5		5.00	1.52	100					0%	S5	S4				
28	140	145	42.67	44.20	4		4.00	1.22	80					0%	S3					
29	145	150	44.20	45.72	5		5.00	1.52	100					0%						
30	150	155	45.72	47.24	5		5.00	1.52	100		38	38		0%	R0					
31	155	160	47.24	48.77	0.5		0.50	0.15	10		6	6		0%	R0				grey brown highly weahered curmbly / jointed rock	
32	160	165	48.77	50.29	4.9		4.90	1.49	98		30	30		0%	R2	R0			stained J's, smooth, no gouge R0 crumbly to 163ft, then weak jointed	
33	165	170	50.29	51.82	5		5.00	1.52	100	6	25	20		0%	R2	R0			red stained J's, weathered at J's highly weathered rock	
34	170	173	51.82	52.73	2		2.00	0.61	67		16	16		0%	R2	R0			red stained J's, weathered at J's highly weathered rock	
35	173	178	52.73	54.25	1	11	1.92	0.58	38	5	25	20		0%	R2	R0			red stained J's, weathered at J's highly weathered rock + one Qz vein	
36	178	180	54.25	54.86		9	0.75	0.23	38	4	8	4		0%	R3	R0			black staining highly weathered rock	
37	180	185	54.86	56.39		10	0.83	0.25	17		32	32		0%	R0				highly weathered rock	
38	185	190	56.39	57.91		9	0.75	0.23	15	4	4			0%	R1				broken Qz pieces of Qz vein included	
39	190	195	57.91	59.44	1	8	1.67	0.51	33		40	40		0%	R0				red stained J's	



# MW09-3



overburden



weathered bedrock



fresh bedrock

## Geotechnical log (basic+)

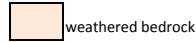
\* 10ft rods were used, with 5ft core barrel,  
HQ3 bit, with split tubes; casing depth 10ft

Run #	Run Interval				TCR						OF	J	CJ	+J from RZ	RQD		IRS		micro def. 0 to 3	J - properties	comment
	From	To	From	To	ft	inches	decimal ft	m	%	cm					%	strong	weak				
	ft	ft	m	m																	
1	10	15	3.05	4.57	3.5		3.50	1.07	70	8	28	0	24	15	14%	R2	R0	2	brown stained J's	crumbly R0 zones, highly weathered	
2	15	20	4.57	6.10	3	1	3.08	0.94	62	7	12	0	6	30	32%	R3	R0	2	planar rough, stained, alpha 45 deg	weathered rock, jointed, RZ (15cm) R0, minor Qz vein	
3	20	25	6.10	7.62	5		5.00	1.52	100	13	9	0		123	81%	R3		2	7, 4   9   0 staining only; alpha 50 to 60 degrees	weathered rock, jointed	
4	25	30	7.62	9.14	5	1	5.08	1.55	102	10	9	0		145	94%	R4	R3	1	4, 7, 8   1, 3, 0   0 brown non softening fill, alpha 60 to 80 degrees	slightly weathered rock / competent rock	
5	30	35	9.14	10.67	5		5.00	1.52	100	6	3	0		147	96%	R4	R3	0	4 to 7   0   0, stained brown-orange	1 Qz vein	
6	35	40	10.67	12.19	5		5.00	1.52	100	8	5	0		150	98%	R4	R3	0	4 to 8   0   0, stained brown-orange, alpha 50 to 70 degrees		
7	40	45	12.19	13.72	4	9	4.75	1.45	95	12	10	0		108	75%	R4	R3	0	7   0 to 3   0 stained orange, alpha 30 to 70 degrees	slightly altered from 41 to 43'	
8	45	50	13.72	15.24	5	3	5.25	1.60	105	9	7	1		148	92%	R4	R3	0	7   0   0 stained orange, alpha 45		
9	50	55	15.24	16.76	5		5.00	1.52	100	6	3	0		150	98%	R5	R4	0	4 to 7   0   0, stained, alpha 45 to 70 degrees		
10	55	60	16.76	18.29	4	10.5	4.88	1.49	98	7	4	0		149	100%	R5	R4	0	4 to 7   0   0, slightly stained	very competent fresh rock, crs grained, 1 large vein	
11	60	65	18.29	19.81	4	10.5	4.88	1.49	98	6	5	0		149	100%	R5	R4	0	4 to 7   0   0, no staining		
12	65	67	19.81	20.42	2	2	2.17	0.66	108	5	4	1		66	100%	R5	R3	0		competent grey/pink rock (logged from photo)	
13	67	70	20.42	21.34	3	6	3.50	1.07	117	2	1	0		100	94%	R5	R4	0			
14	70	75	21.34	22.86	4	10	4.83	1.47	97	6	3	0		148	100%	R5	R4	0	J walls planar, undulating, rough, brown & altered; alpha 30 to 80 degrees		
15	75	80	22.86	24.38	4	10	4.83	1.47	97	6	5	0		138	94%	R5	R4	0	stained J's	grey brown rock, slightly altered	
16	80	85	24.38	25.91	4	7.5	4.63	1.41	93	6	3	0		141	100%	R5	R4	0	all J's weathered with non softening fill, altered J wall; alpha 45 to 90 degrees	fluid flow evidence	
18	85	90	25.91	27.43	5	2	5.17	1.57	103	4	4	0		149	95%	R5	R4	1			
19	90	95	27.43	28.96	5		5.00	1.52	100	11	6	4		149	98%	R5	R4	1	1 J with soft fill 0.5mm brown clay, alpha 15 degrees		
20	95	100	28.96	30.48	5	2	5.17	1.57	103	12	13	0	4	133	84%	R4	R2	0	1 J at 99' has 1 cm brown clay gauge fill (alpha 50 degrees)	RZ (10cm) jointed at 96'; R2 rock highly altered, brown from 95-96'	
21	100	105	30.48	32.00	5		5.00	1.52	100	6	5	1		150	98%	R5	R4	0			
22	105	110	32.00	33.53	5	2	5.17	1.57	103	7	5	1		146	93%	R5	R4	1	1 J has 0.5mm soft fill		
23	110	115	33.53	35.05	5	1	5.08	1.55	102	10	11	3		122	79%	R5	R4	0		mineralization around micro defects at 111.5'	
24	115	120	35.05	36.58	5	1	5.08	1.55	102	12	7	1		103	66%	R5	R4	1	hard fill in Js		
25	120	125	36.58	38.10	5	2	5.17	1.57	103	12	6	2		140	89%	R5	R4	1			
26	125	130	38.10	39.62	4	11	4.92	1.50	98	10	5	1		135	90%	R5	R4	1	1 J has 2mm soft fill		
27	130	135	39.62	41.15	5		5.00	1.52	100	14	14	0		62	41%	R5	R3	1			
28	135	140	41.15	42.67	5	2	5.17	1.57	103	8	6	1		141	90%	R5	R4	1			
29	140	145	42.67	44.20	5		5.00	1.52	100	9	7	0		150	98%	R5	R4	1			
30	145	150	44.20	45.72	5		5.00	1.52	100	7	5	0		137	90%	R5	R4	1			
31	150	155	45.72	47.24	5		5.00	1.52	100	7	4	1		144	94%	R5	R4	0			
32	155	160	47.24	48.77	4	10	4.83	1.47	97	10	5	1		133	90%	R5	R4	1	1 J has 2mm soft fill		
33	160	165	48.77	50.29	4	9	4.75	1.45	95	9	7	0		139	96%	R5	R4	0	Js betw 162-163' have 2mm of soft fill		

MW09-4



overburden



weathered bedrock



fresh bedrock

Geotechnical log (basic+)

\* 10ft rods were used, with 5ft core barrel, HQ3 bit, with split tubes; casing depth 10ft

Run #	Run Interval				TCR					OF	J	CJ	+J from RZ	RQD		IRS		micro def.	J - properties	comment	
	From	To	From	To	ft	inches	decimal ft	m	%					cm	%	strong	weak				0 to 3
	ft	ft	m	m																	
1	5	6	1.52	1.83	1		1.00	0.30	100					0%	S3						
2	6	11	1.83	3.35	2.2		2.20	0.67	44					0%	S4						
3	11	15	3.35	4.57	3		3.00	0.91	75					0%	S4						
4	15	20	4.57	6.10	3.6		3.60	1.10	72					0%	S3						
5	20	25	6.10	7.62	5		5.00	1.52	100					0%	S4	S2					
6	25	30	7.62	9.14	5		5.00	1.52	100					0%	S4						
7	30	35	9.14	10.67	5		5.00	1.52	100					0%	S4						
8	35	40	10.67	12.19	5		5.00	1.52	100					0%	S4	S3					
9	40	45	12.19	13.72	4		4.00	1.22	80					0%	S4						
10	45	50	13.72	15.24	5		5.00	1.52	100					0%	S4						
11	50	55	15.24	16.76	4.2		4.20	1.28	84					0%	S4						
12	55	60	16.76	18.29	5		5.00	1.52	100					0%	S4						
13	60	65	18.29	19.81	5		5.00	1.52	100					0%	S4						
14	65	70	19.81	21.34	5		5.00	1.52	100					0%	S4	S3					
15	70	75	21.34	22.86	5		5.00	1.52	100					0%	S4						
16	75	80	22.86	24.38	5		5.00	1.52	100					0%	S4						
18	80	85	24.38	25.91	5		5.00	1.52	100					0%	S4						
19	85	90	25.91	27.43	5		5.00	1.52	100					0%	S4						
20	90	95	27.43	28.96	0		0.00	0.00	0						S4						
21	95	100	28.96	30.48	5		5.00	1.52	100					0%	S4						
22	100	105	30.48	32.00	3		3.00	0.91	60					0%	S4						
23	105	110	32.00	33.53	5.2		5.20	1.58	104					0%	S4						
24	110	115	33.53	35.05	5		5.00	1.52	100					0%	S4						
25	115	120	35.05	36.58	5		5.00	1.52	100					0%	S4						
26	120	125	36.58	38.10	5		5.00	1.52	100					0%	S4						
27	125	130	38.10	39.62	5		5.00	1.52	100					0%	S4						
28	130	135	39.62	41.15	5		5.00	1.52	100					0%	S4						
29	135	140	41.15	42.67	5		5.00	1.52	100					0%	S4						
30	140	145	42.67	44.20	4.2		4.20	1.28	84					0%	S4						
31	145	150	44.20	45.72	4.8		4.80	1.46	96		60	60	0	0%	R0	S4			highly weathered rock (brown and pink rock fragments, light brown-orange crs.sand and f.gravel), low clay content (10%)		
32	150	155	45.72	47.24	5		5.00	1.52	100	51	51	0	48	0	0%	R2	R0	1	R0 rock most of this run	highly wethered rock (brown-orange c.sand, clayey, altered rock frags, Qz vein, very weak rock)	
33	155	160	47.24	48.77	5		5.00	1.52	100	7	9	0	8	152	100%	R3	R0	1	R0 zone 20cm (also jointed)	highly wethered rock, orange-brown alteration, black/white coarse grains remaining of rock; competent rock at 159ft	
34	160	165	48.77	50.29	3	4	3.33	1.02	67	7	6	0		24	24%	R3	R1	1	soft/hard fill in J's	very weathered jointed rock	
35	165	170	50.29	51.82	5		5.00	1.52	100	6	5	0		80	52%	R3	R2	1	soft fill in J's or red staining,	weathered jointed rock	
36	170	175	51.82	53.34	5		5.00	1.52	100	9	4	0		140	92%	R3	R2	0	crs. fill in J's, red staining	weathered jointed rock	
37	175	180	53.34	54.86	5	3	5.25	1.60	105	8	7	0		136	85%	R4	R2	0			
38	180	185	54.86	56.39	4	10	4.83	1.47	97	9	8	0	4	137	93%	R4	R0	2	black stained J's or crs.fill	RZ (10cm) at litho change, R0 rock	
39	185	190	56.39	57.91	5	2	5.17	1.57	103	8	2	0		140	89%	R4	R2	0	black rusty staining on all J's		
40	190	195	57.91	59.44	5	1	5.08	1.55	102	10	8	0		143	92%	R4		0	black rusty staining on all J's		
41	195	199.5	59.44	60.81	4	5	4.42	1.35	98	12	8	0		82	61%	R4		0	stained J's, various colours and minerals		
42	199.5	205	60.81	62.48	5	3	5.25	1.60	95	9	6	1		136	85%	R5	R3	0	hard fill on J surfaces		
43	205	210	62.48	64.01	5		5.00	1.52	100	9	7	0		137	90%	R5	R4	0	hard fill on J surfaces		
44	210	215	64.01	65.53	5		5.00	1.52	100	10	10	0		78	51%	R4	R3	0	hard fill on J surfaces		
45	215	220	65.53	67.06	5	2	5.17	1.57	103	14	10	0		93	59%	R4	R1	0	hard fill on J surfaces		
46	220	225	67.06	68.58	5	2	5.17	1.57	103	7	5	0		158	100%	R4	R3	0	hard fill on J surfaces		
47	225	230	68.58	70.10	5		5.00	1.52	100	11	8	0		135	89%	R4		1			
48	230	235	70.10	71.63	5		5.00	1.52	100	13	9	0		85	56%	R4	R2				
49	235	240	71.63	73.15	4		4.92	1.50	98	6	1	0		150	100%	R5					
50	240	245	73.15	74.68	5		5.00	1.52	100	10	9	0		132	87%	R4	R3				
51	245	250	74.68	76.20	4	9	4.75	1.45	95	10	8	0		70	48%	R4				bright green mineralization on J surfaces	





**DEFINITIONS**

FF/m: Fracture Frequency per metre  
 TCR: Total Core Recovery  
 RQD: Rock Quality Designation  
 IRS: Intact Rock Strength (field est.)

**Lithology**

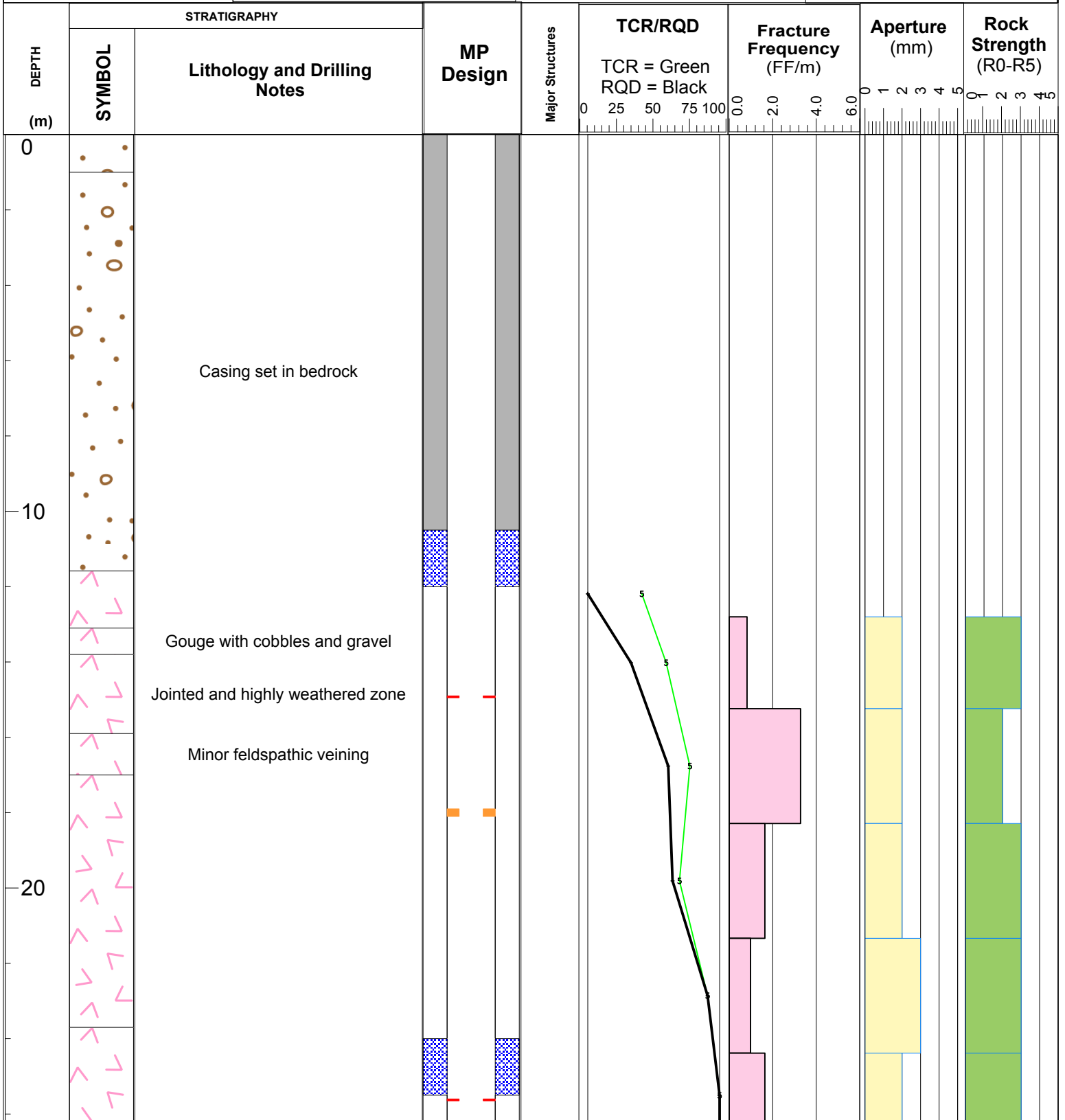
- Overburden
- Weathered Granodiorite
- Mafic Intrusive
- Granodiorite

**MP components**

- Casing
- PVC
- PPort
- MPort
- Packer

**Major Structures Legend**

- gouge
- broken gouge
- broken
- contact
- jointed



**DEFINITIONS**

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**Lithology**

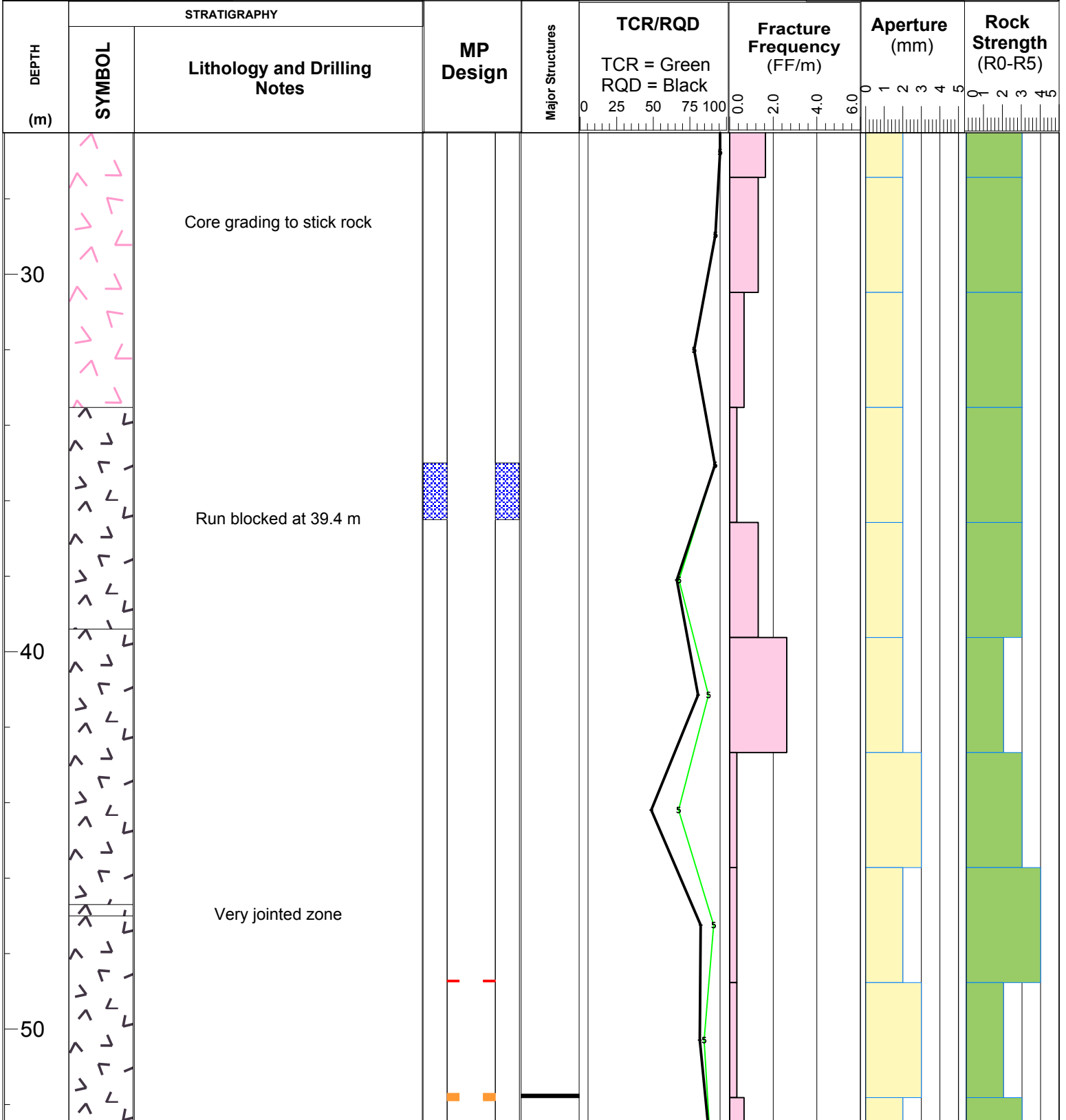
- Overburden
- Weathered Granodiorite
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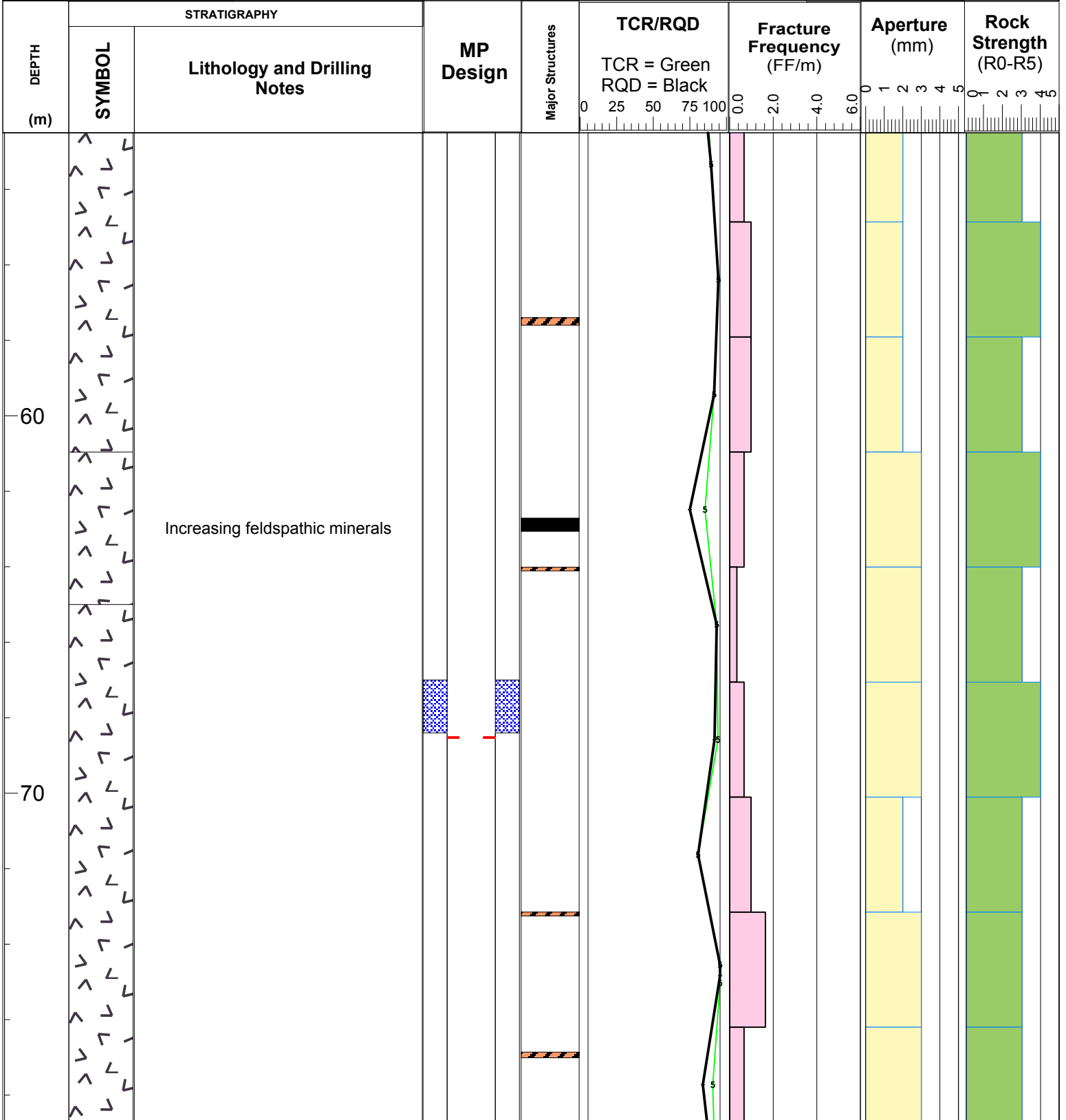
- Overburden
- Weathered Granodiorite
- Mafic Intrusive
- Granodiorite

**MP components**

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- Packer
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- MPort

**Major Structures Legend**

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**DEFINITIONS**

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**Lithology**

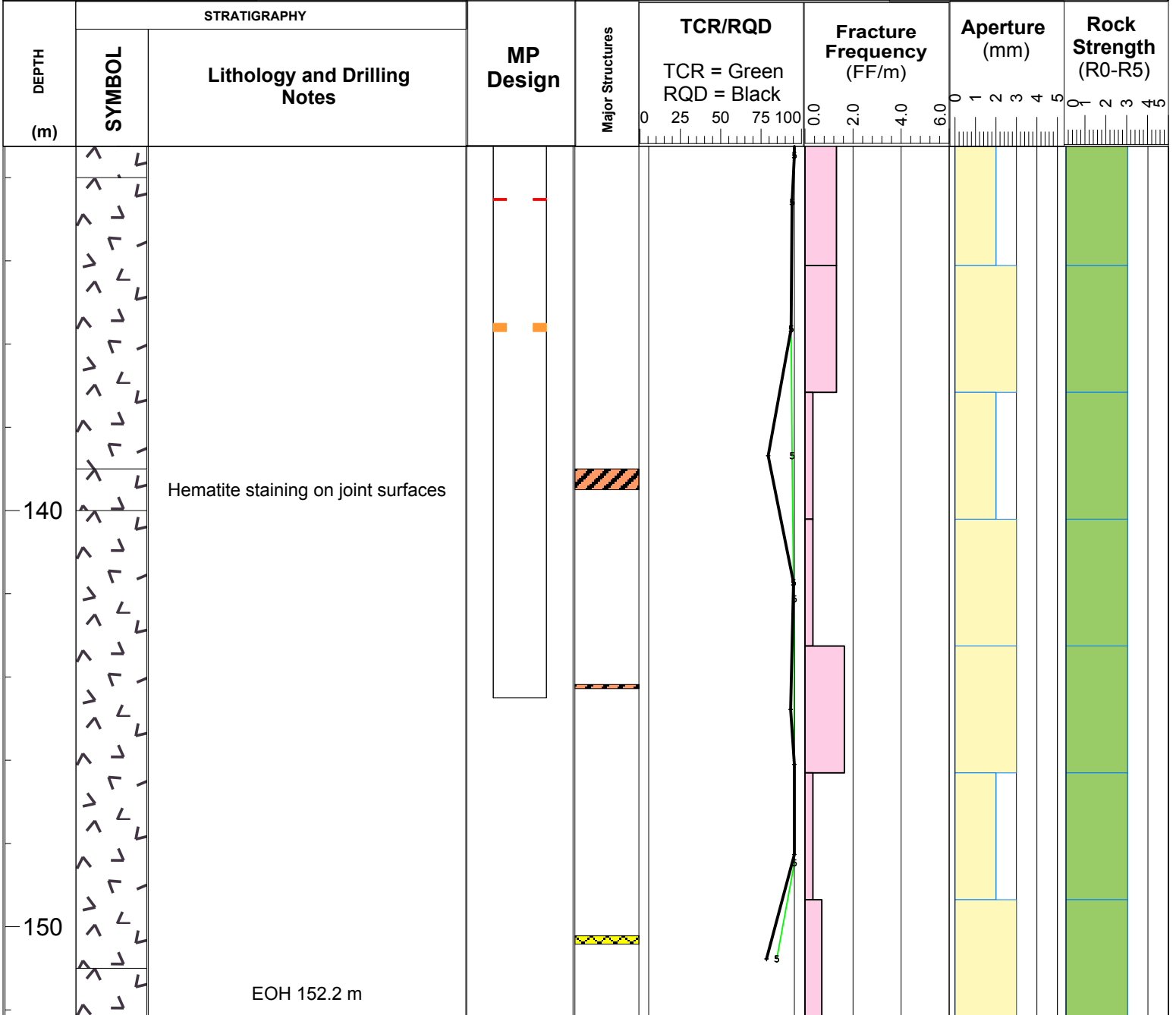
- Overburden
- Weathered Granodiorite
- Mafic Intrusive
- Granodiorite

**MP components**

- Casing
- PVC
- Packer
- PPort
- MPort

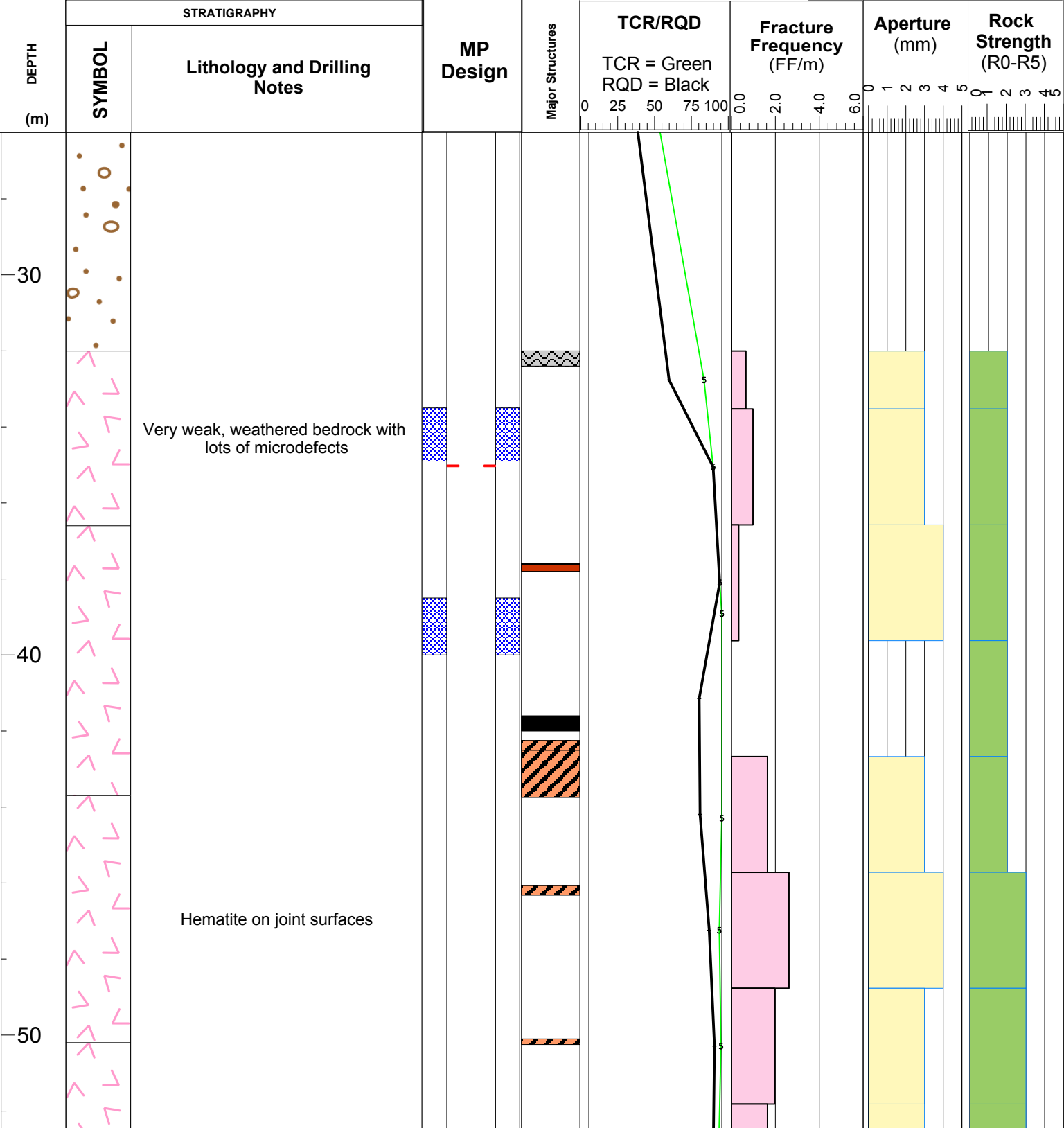
**Major Structures Legend**

- gouge
- broken gouge
- broken
- contact
- jointed





<b>DEFINITIONS</b> FF/m: Fracture Frequency per metre TCR: Total Core Recovery RQD: Rock Quality Designation IRS: Intact Rock Strength (field est.)	<b>Lithology</b> Overburden (white box) Mafic Intrusive (diagonal lines) Weathered Granodiorite (pink triangle) Granodiorite (white box with black outline)		<b>MP components</b> Casing (grey box) Packer (blue dotted box) PVC (white box) MPort (red vertical bar)		<b>Major Structures Legend</b> gouge (black box) broken (diagonal lines) jointed (yellow box with black outline) broken gouge (grey box with diagonal lines) contact (orange box)	
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**DEFINITIONS**

FF/m: Fracture Frequency per metre  
 TCR: Total Core Recovery  
 RQD: Rock Quality Designation  
 IRS: Intact Rock Strength (field est.)

**Lithology**

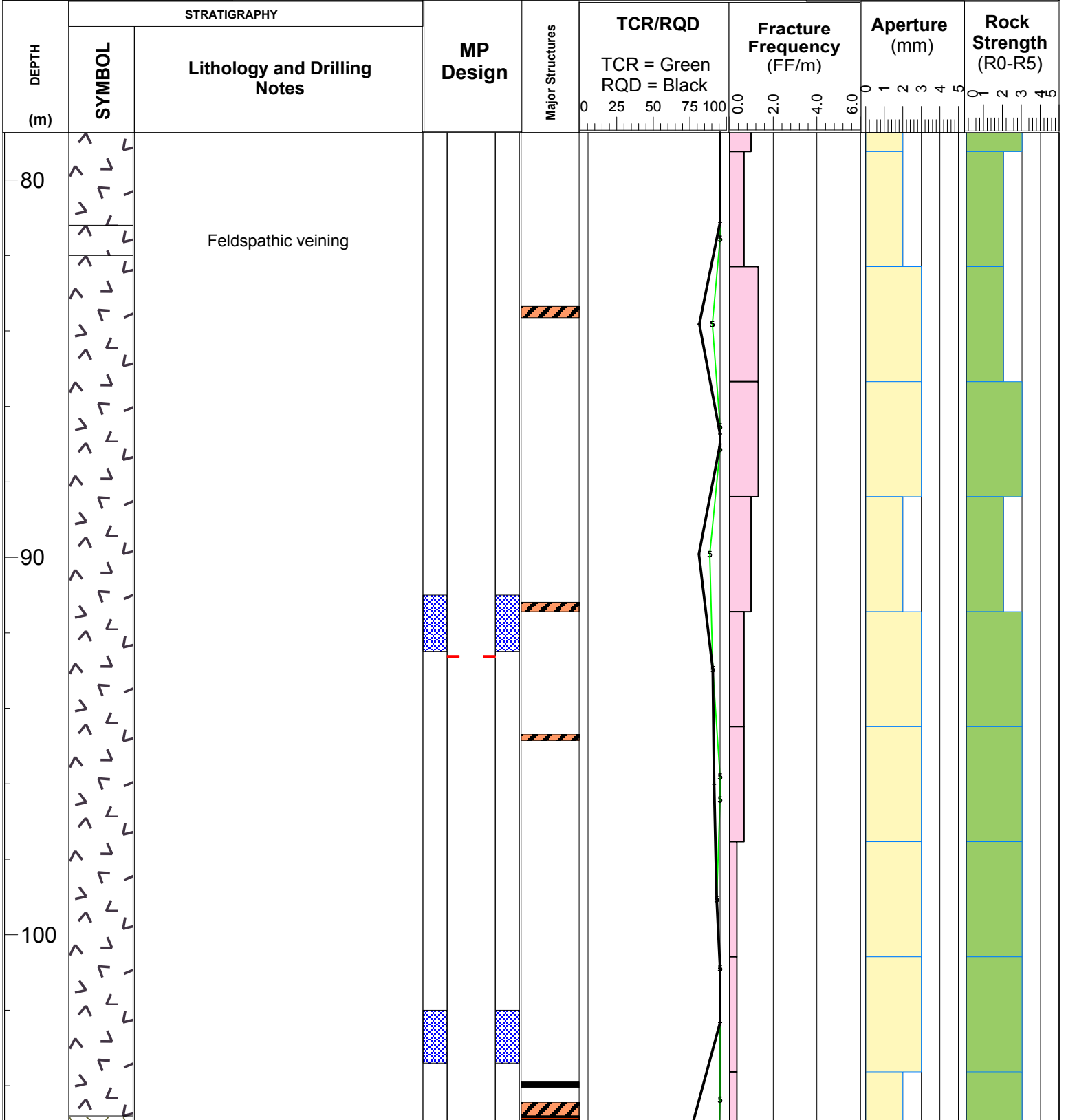
- Overburden
- Weathered Granodiorite
- Mafic Intrusive
- Granodiorite

**MP components**

- Casing
- PVC
- Packer
- MPort
- PPort

**Major Structures Legend**

- gouge
- broken gouge
- broken
- contact
- jointed















**DEFINITIONS**

FF/m: Fracture Frequency per metre  
 TCR: Total Core Recovery  
 RQD: Rock Quality Designation  
 IRS: Intact Rock Strength (field est.)

**Lithology**

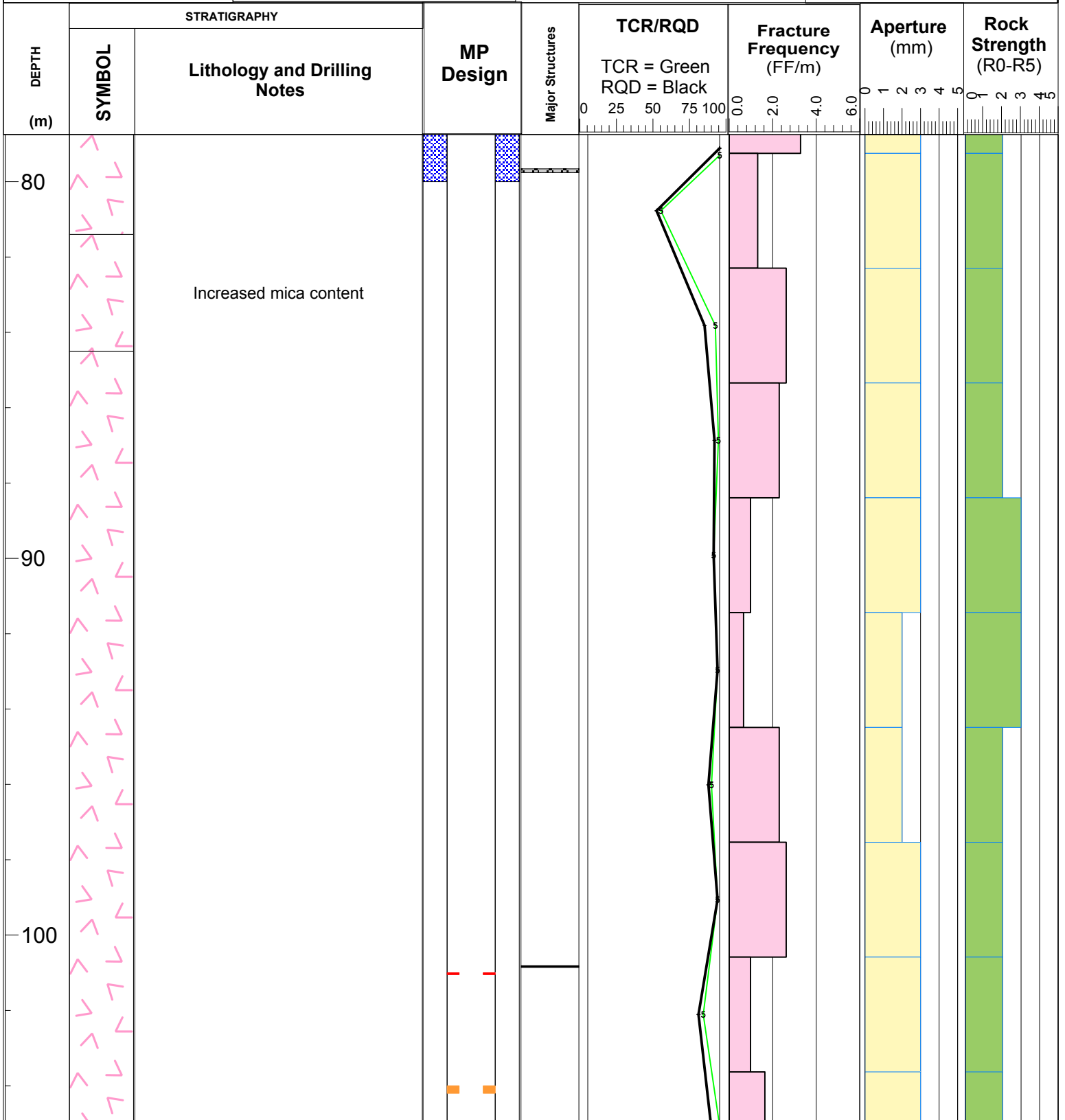
- Overburden
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- Granodiorite

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- PVC
- Packer
- PPort
- MPort

**Major Structures Legend**

- gouge
- broken gouge
- broken
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- jointed



**DEFINITIONS**

FF/m: Fracture Frequency per metre  
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 RQD: Rock Quality Designation  
 IRS: Intact Rock Strength (field est.)

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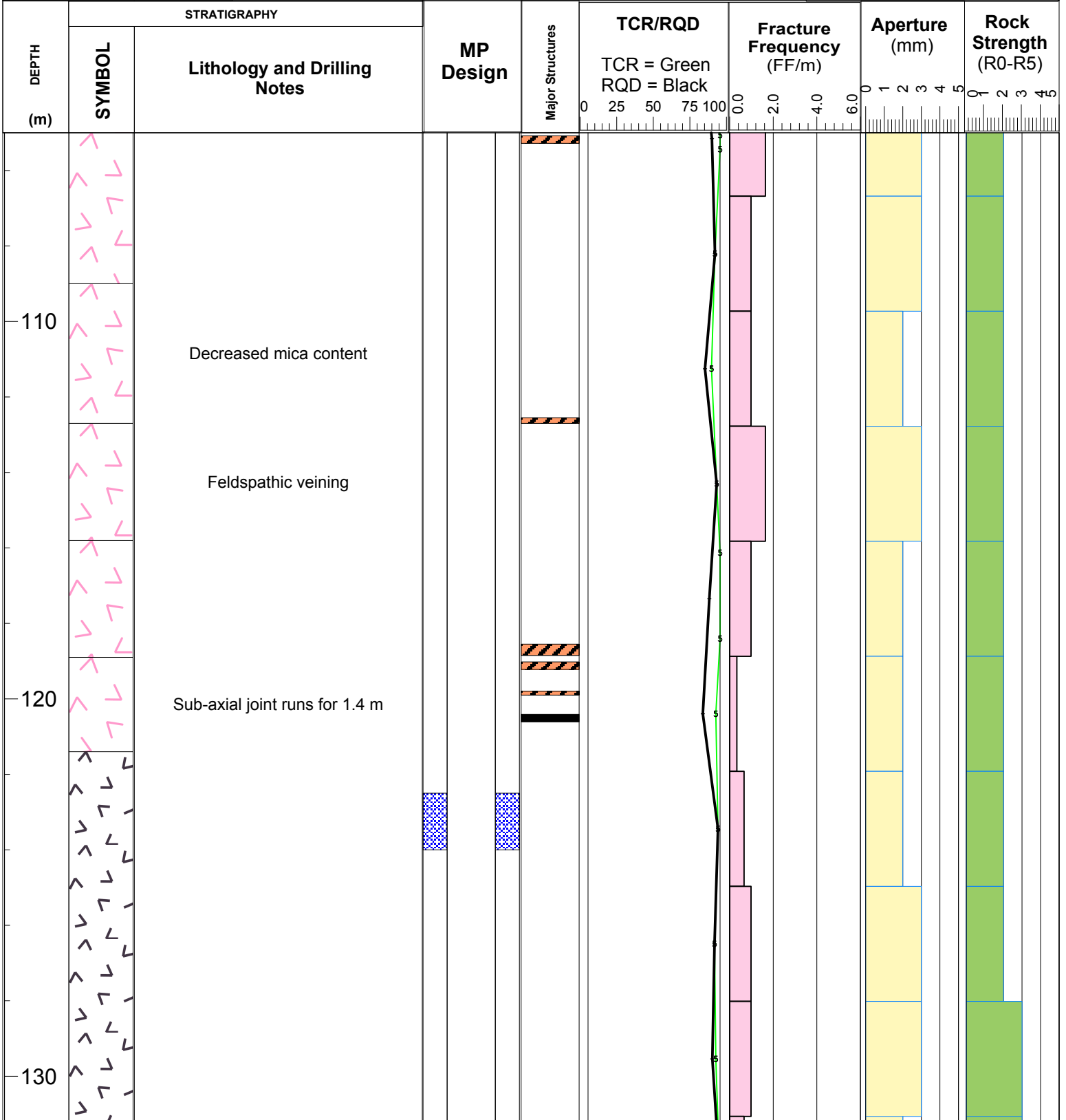
- Overburden
- Weathered Granodiorite
- Mafic Intrusive
- Granodiorite

**MP components**

- Casing
- PVC
- Packer
- PPort
- MPort

**Major Structures Legend**

- gouge
- broken gouge
- broken
- contact
- jointed

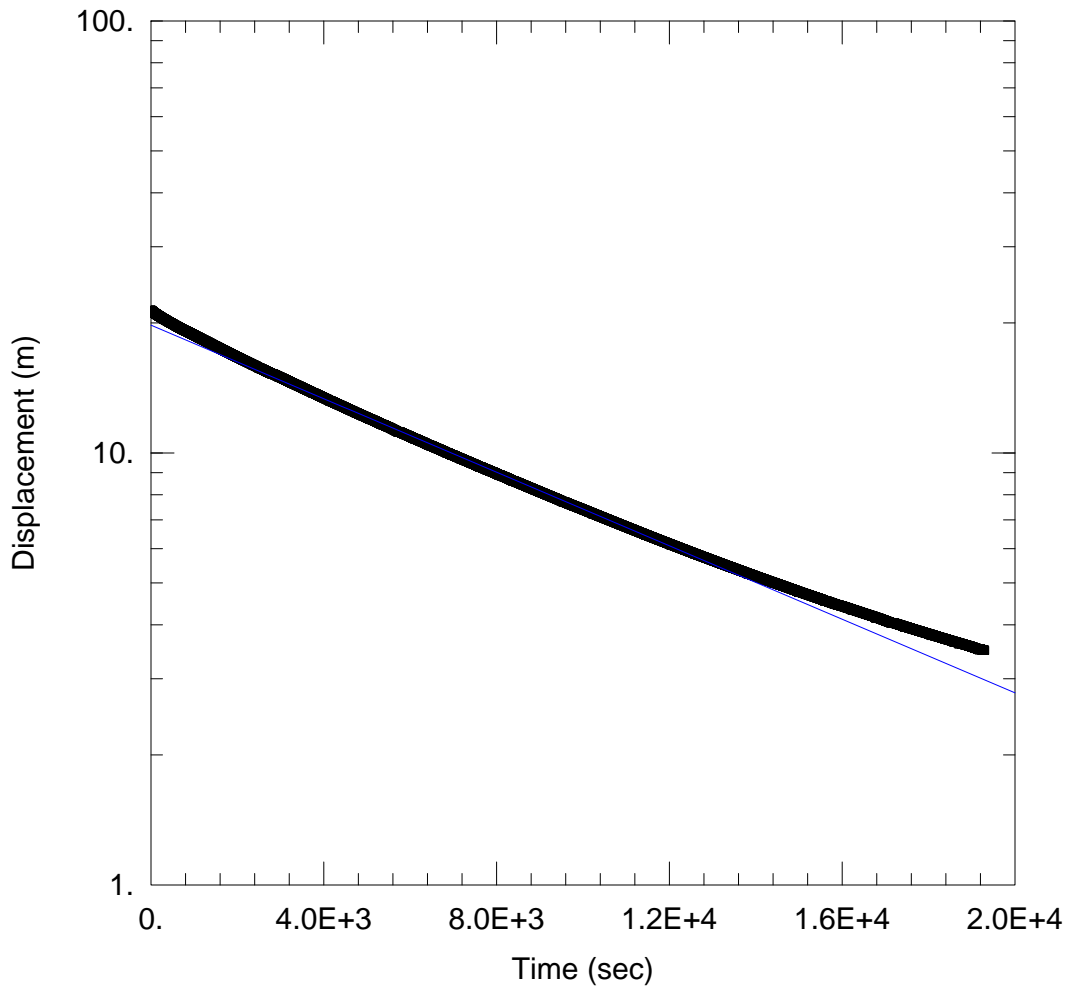






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## Appendix B: Rising Head Test Analyses



### WELL TEST ANALYSIS

Data Set: \...\Aqtw1 MW12-05-01 Test1 PosDisp Cut.aqt

Date: 03/15/13

Time: 09:41:40

### PROJECT INFORMATION

Company: SRK

Client: Capstone - Minto

Project: 1CM002.008

Location: Minto Mine, YT

Test Well: MW12-07-01

Test Date: November 3, 2012

### AQUIFER DATA

Saturated Thickness: 141.1 m

Anisotropy Ratio (Kz/Kr): 1.

### WELL DATA (MW12-05-01)

Initial Displacement: 21.41 m

Static Water Column Height: 141.1 m

Total Well Penetration Depth: 141.1 m

Screen Length: 18.5 m

Casing Radius: 0.019 m

Well Radius: 0.3175 m

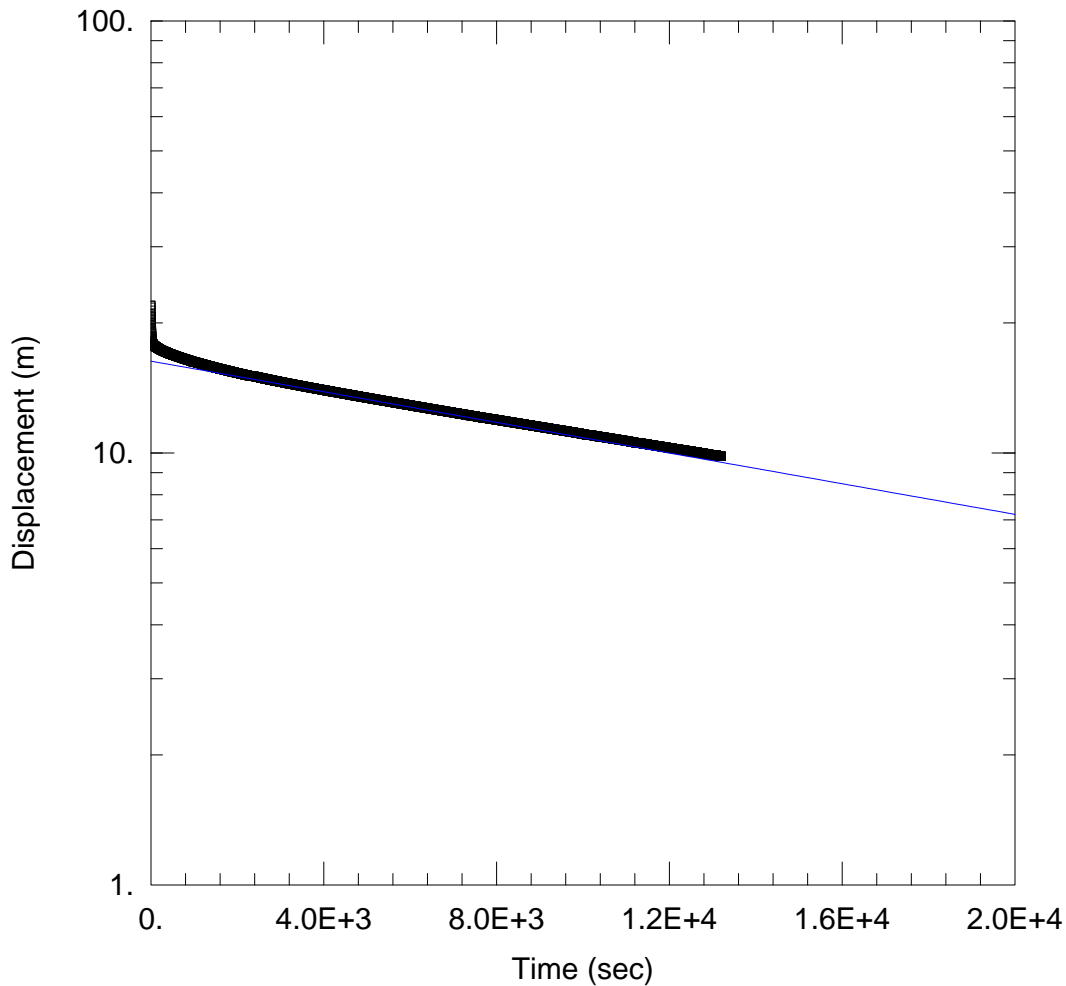
### SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 4.144E-9 m/sec

y0 = 19.76 m



### WELL TEST ANALYSIS

Data Set: \...\Aqtw1 MW12-05-02 Test1 PosDisp Cut.aqt

Date: 03/15/13

Time: 09:44:12

### PROJECT INFORMATION

Company: SRK

Client: Capstone - Minto

Project: 1CM002.008

Location: Minto Mine, YT

Test Well: MW12-07-01

Test Date: November 3, 2012

### AQUIFER DATA

Saturated Thickness: 104.5 m

Anisotropy Ratio (Kz/Kr): 1.

### WELL DATA (MW12-05-02 T1)

Initial Displacement: 21.98 m

Static Water Column Height: 104.5 m

Total Well Penetration Depth: 104.5 m

Screen Length: 23. m

Casing Radius: 0.019 m

Well Radius: 0.3175 m

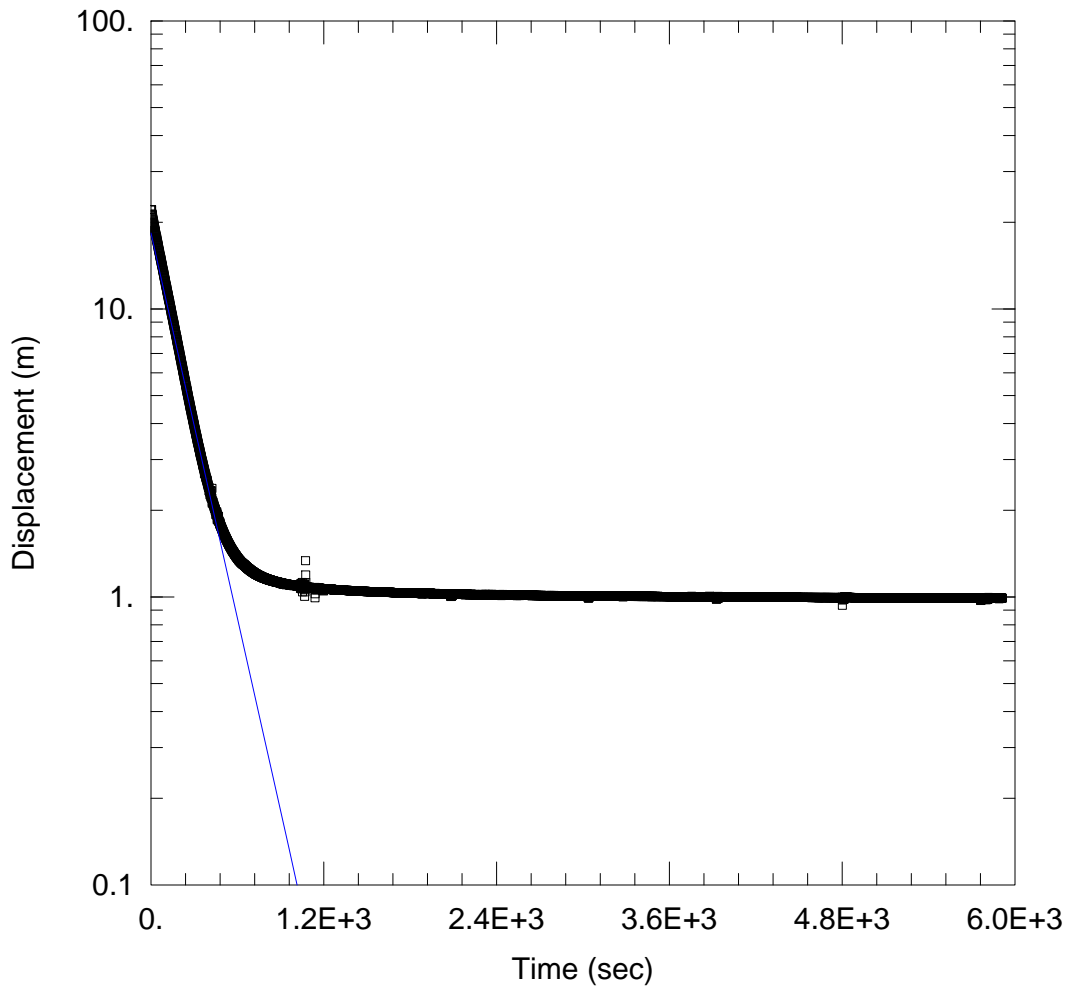
### SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 1.352E-9 m/sec

y0 = 16.31 m



### WELL TEST ANALYSIS

Data Set: C:\...\Aqtw1 MW12-05-02 Test2 PosDisp Cut.aqt

Date: 03/15/13

Time: 09:45:45

### PROJECT INFORMATION

Company: SRK

Client: Capstone - Minto

Project: 1CM002.008

Location: Minto Mine, YT

Test Well: MW12-07-01

Test Date: November 3, 2012

### AQUIFER DATA

Saturated Thickness: 104.5 m

Anisotropy Ratio (Kz/Kr): 1.

### WELL DATA (MW12-05-02 T2)

Initial Displacement: 22.12 m

Static Water Column Height: 104.5 m

Total Well Penetration Depth: 104.5 m

Screen Length: 23. m

Casing Radius: 0.019 m

Well Radius: 0.3175 m

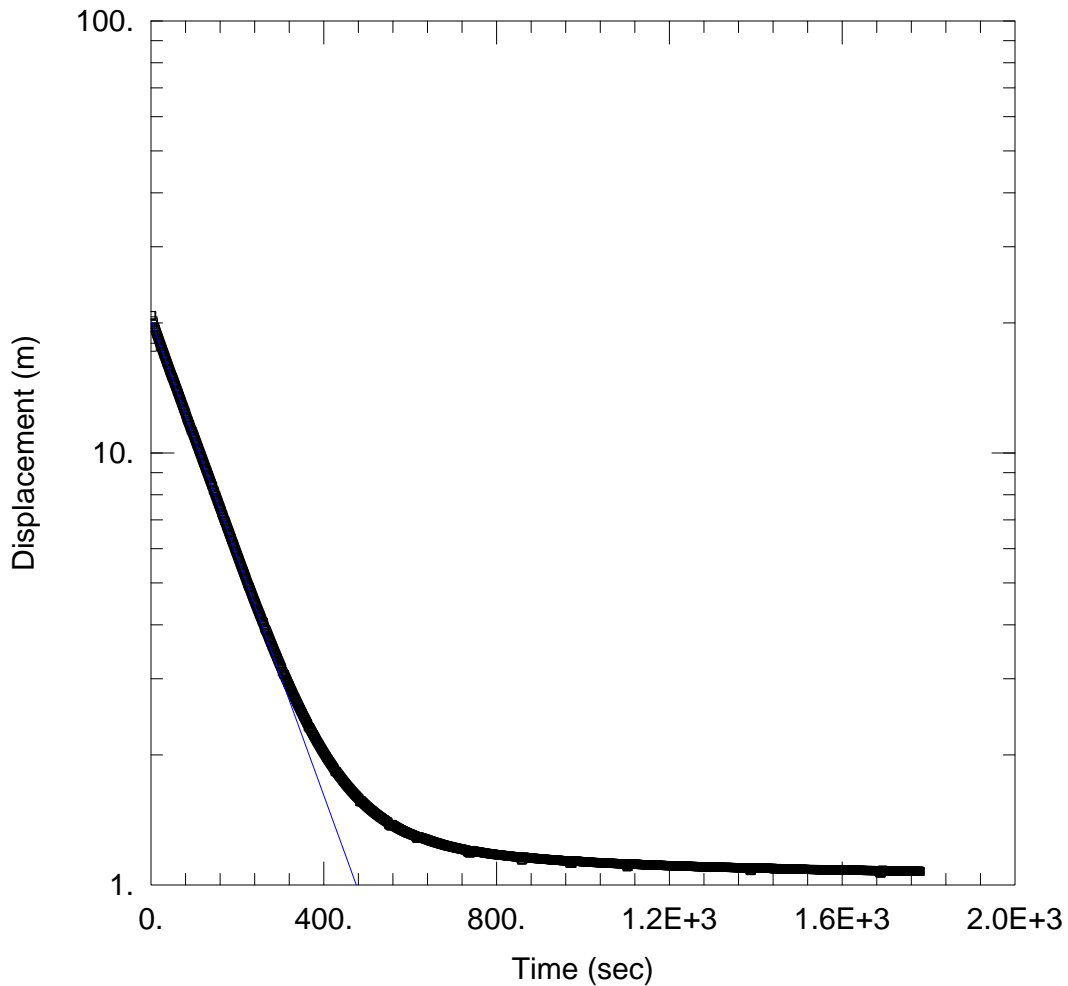
### SOLUTION

Aquifer Model: Unconfined

Solution Method: Bower-Rice

K = 1.7E-7 m/sec

y0 = 18.35 m



### WELL TEST ANALYSIS

Data Set: C:\...\Aqtw1 MW12-05-02 Test3 PosDisp Cut.aqt

Date: 03/15/13

Time: 09:46:03

### PROJECT INFORMATION

Company: SRK

Client: Capstone - Minto

Project: 1CM002.008

Location: Minto Mine, YT

Test Well: MW12-07-01

Test Date: November 3, 2012

### AQUIFER DATA

Saturated Thickness: 104.5 m

Anisotropy Ratio (Kz/Kr): 1.

### WELL DATA (MW12-05-02 T3)

Initial Displacement: 20.79 m

Static Water Column Height: 104.5 m

Total Well Penetration Depth: 104.5 m

Screen Length: 23. m

Casing Radius: 0.019 m

Well Radius: 0.3175 m

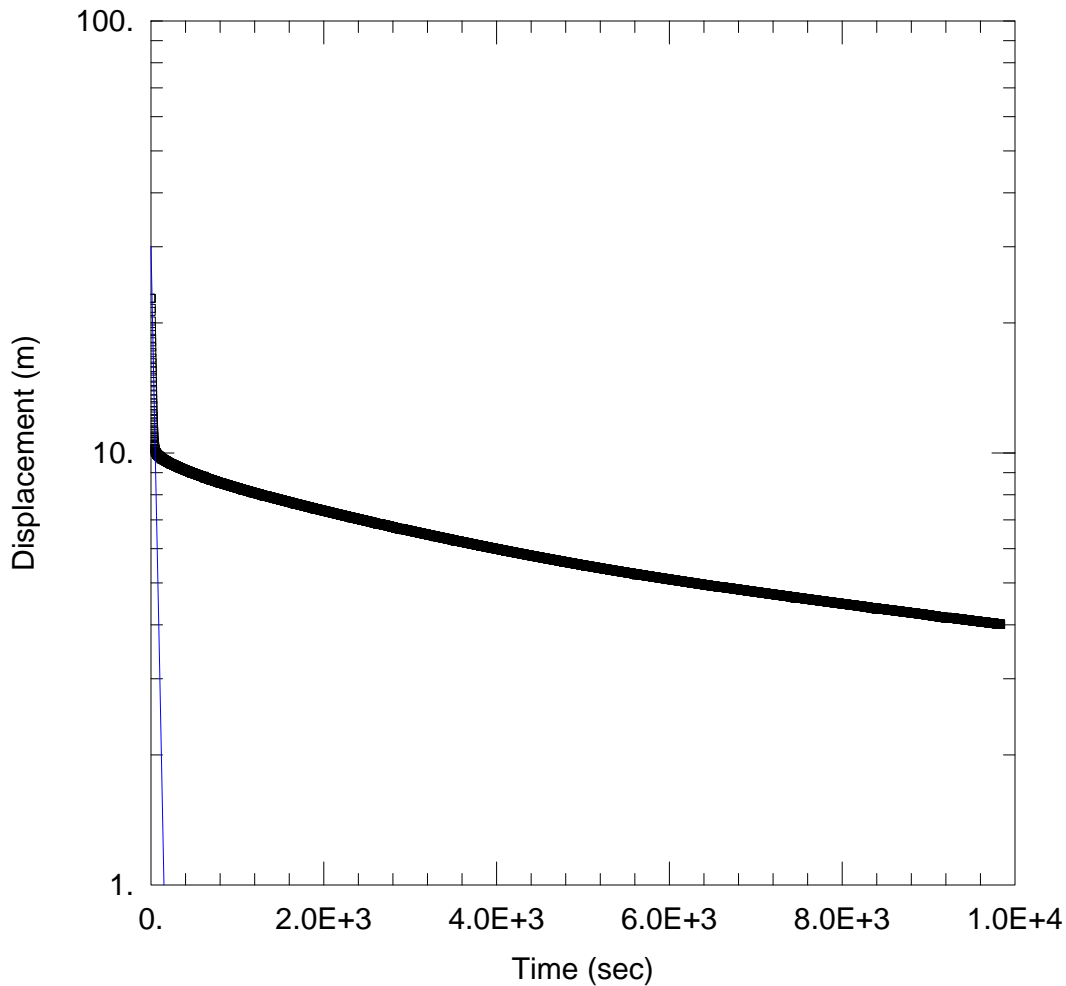
### SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 2.099E-7 m/sec

y0 = 20.34 m



### WELL TEST ANALYSIS

Data Set: C:\...\Aqtw1 MW12-05-03 Test1 PosDisp Cut.aqt  
 Date: 03/15/13 Time: 09:47:00

### PROJECT INFORMATION

Company: SRK  
 Client: Capstone - Minto  
 Project: 1CM002.008  
 Location: Minto Mine, YT  
 Test Well: MW12-07-01  
 Test Date: November 3, 2012

### AQUIFER DATA

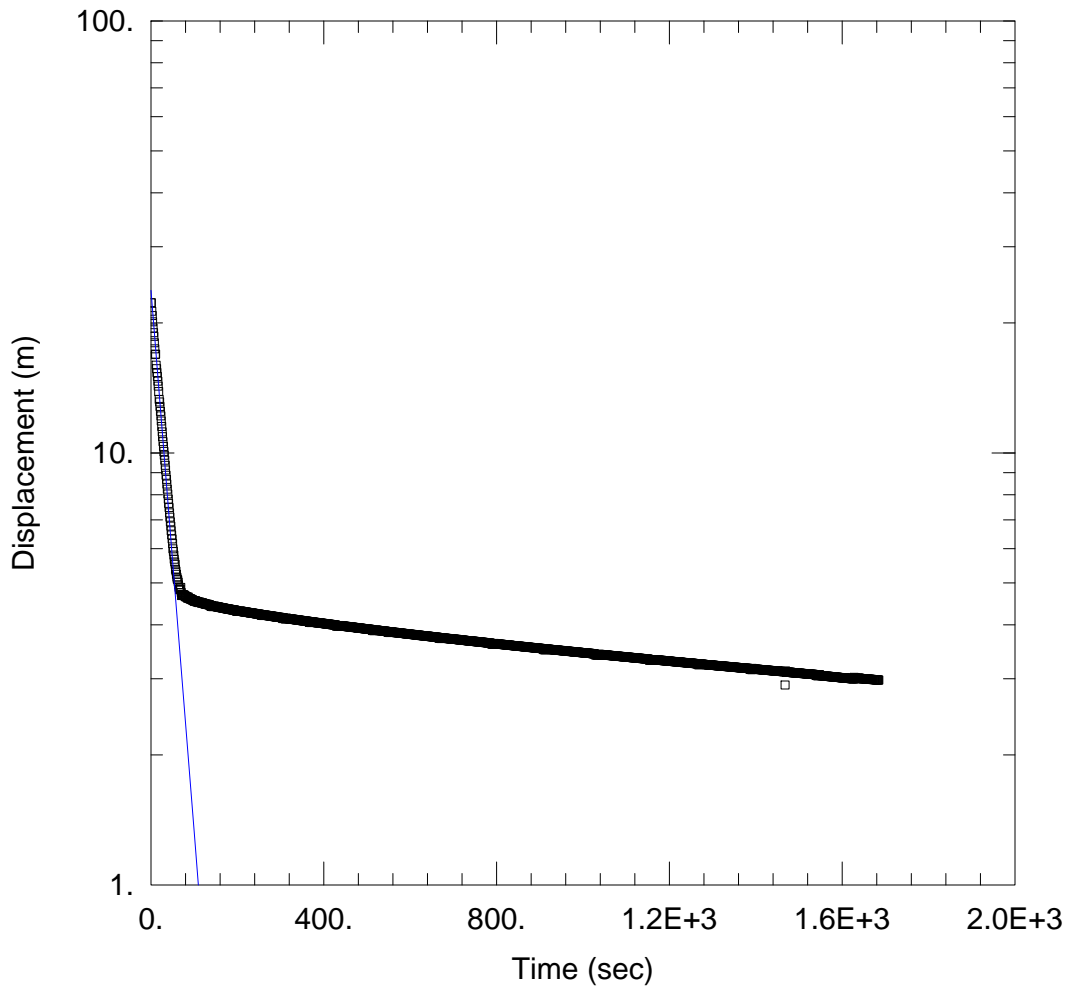
Saturated Thickness: 63.7 m Anisotropy Ratio (Kz/Kr): 1.

### WELL DATA (MW12-05-03 T1)

Initial Displacement: 22.81 m Static Water Column Height: 63.7 m  
 Total Well Penetration Depth: 63.7 m Screen Length: 31. m  
 Casing Radius: 0.019 m Well Radius: 0.3175 m

### SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice  
 K = 5.199E-7 m/sec y0 = 30.05 m



WELL TEST ANALYSIS

Data Set: C:\...\Aqtw1 MW12-05-03 Test3 PosDisp Cut.aqt

Date: 03/15/13

Time: 09:47:22

PROJECT INFORMATION

Company: SRK

Client: Capstone - Minto

Project: 1CM002.008

Location: Minto Mine, YT

Test Well: MW12-07-01

Test Date: November 3, 2012

AQUIFER DATA

Saturated Thickness: 63.7 m

Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW12-05-03 T3)

Initial Displacement: 22.26 m

Static Water Column Height: 63.7 m

Total Well Penetration Depth: 63.7 m

Screen Length: 31. m

Casing Radius: 0.019 m

Well Radius: 0.3175 m

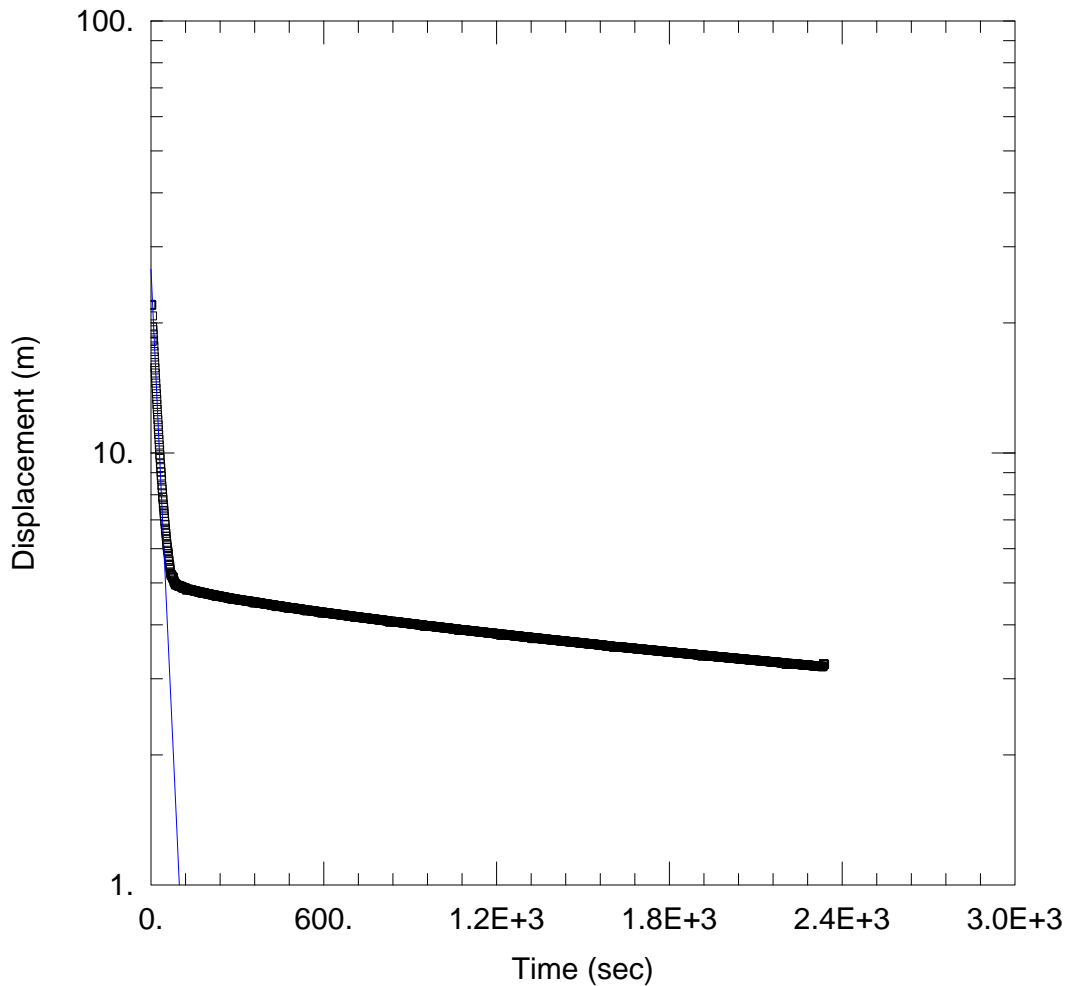
SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 6.69E-7 m/sec

y0 = 23.77 m



WELL TEST ANALYSIS

Data Set: C:\...\Aqtw1 MW12-05-03 Test4 PosDisp Cut.aqt

Date: 03/15/13

Time: 09:47:34

PROJECT INFORMATION

Company: SRK

Client: Capstone - Minto

Project: 1CM002.008

Location: Minto Mine, YT

Test Well: MW12-07-01

Test Date: November 3, 2012

AQUIFER DATA

Saturated Thickness: 63.7 m

Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW12-05-03 T4)

Initial Displacement: 21.99 m

Static Water Column Height: 63.7 m

Total Well Penetration Depth: 63.7 m

Screen Length: 31. m

Casing Radius: 0.019 m

Well Radius: 0.3175 m

SOLUTION

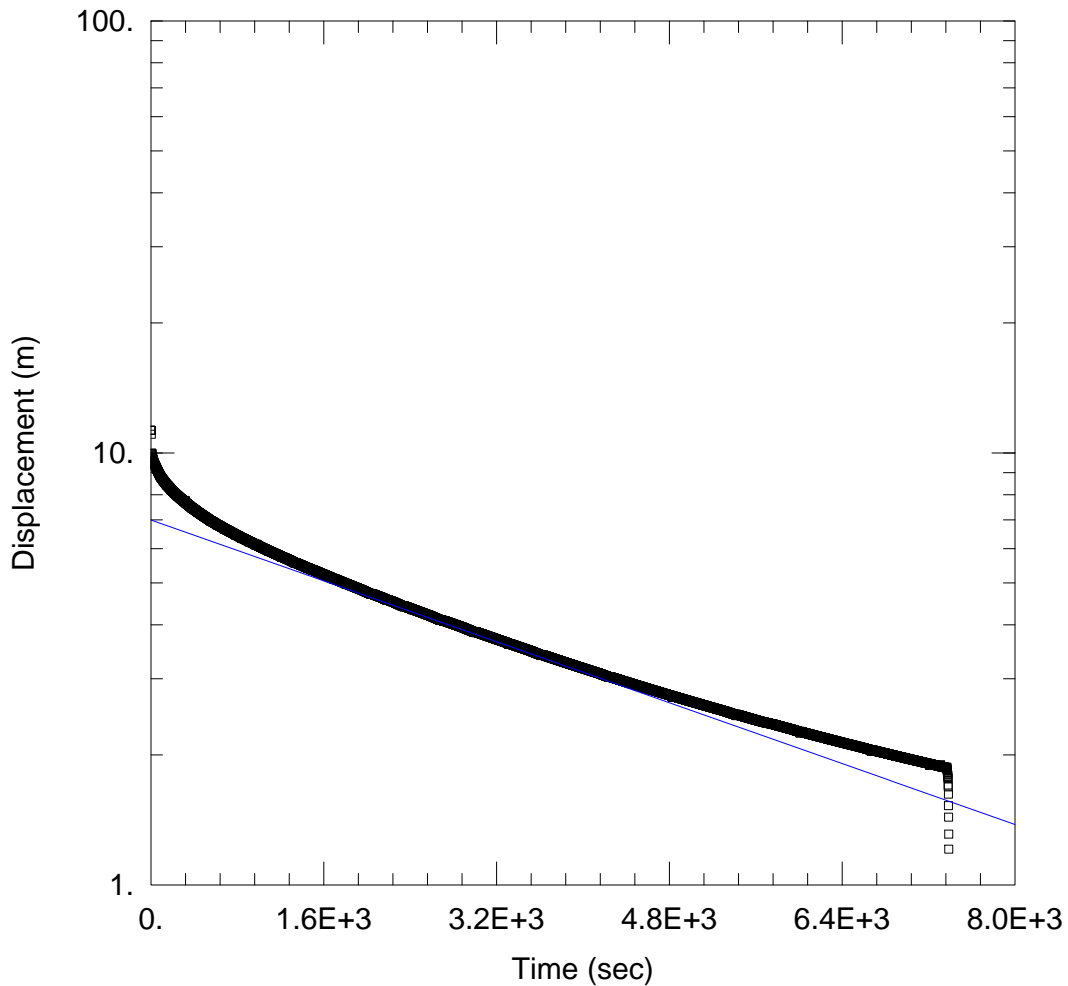
Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 7.715E-7 m/sec

y0 = 26.6 m





### WELL TEST ANALYSIS

Data Set: C:\...\Aqtw1 MW12-05-04 Test1 PosDisp Cut.aqt

Date: 03/15/13

Time: 09:48:39

### PROJECT INFORMATION

Company: SRK

Client: Capstone - Minto

Project: 1CM002.008

Location: Minto Mine, YT

Test Well: MW12-07-01

Test Date: November 3, 2012

### AQUIFER DATA

Saturated Thickness: 20.9 m

Anisotropy Ratio (Kz/Kr): 1.

### WELL DATA (MW12-05-04 T1)

Initial Displacement: 11.28 m

Static Water Column Height: 20.9 m

Total Well Penetration Depth: 20.9 m

Screen Length: 12. m

Casing Radius: 0.019 m

Well Radius: 0.3175 m

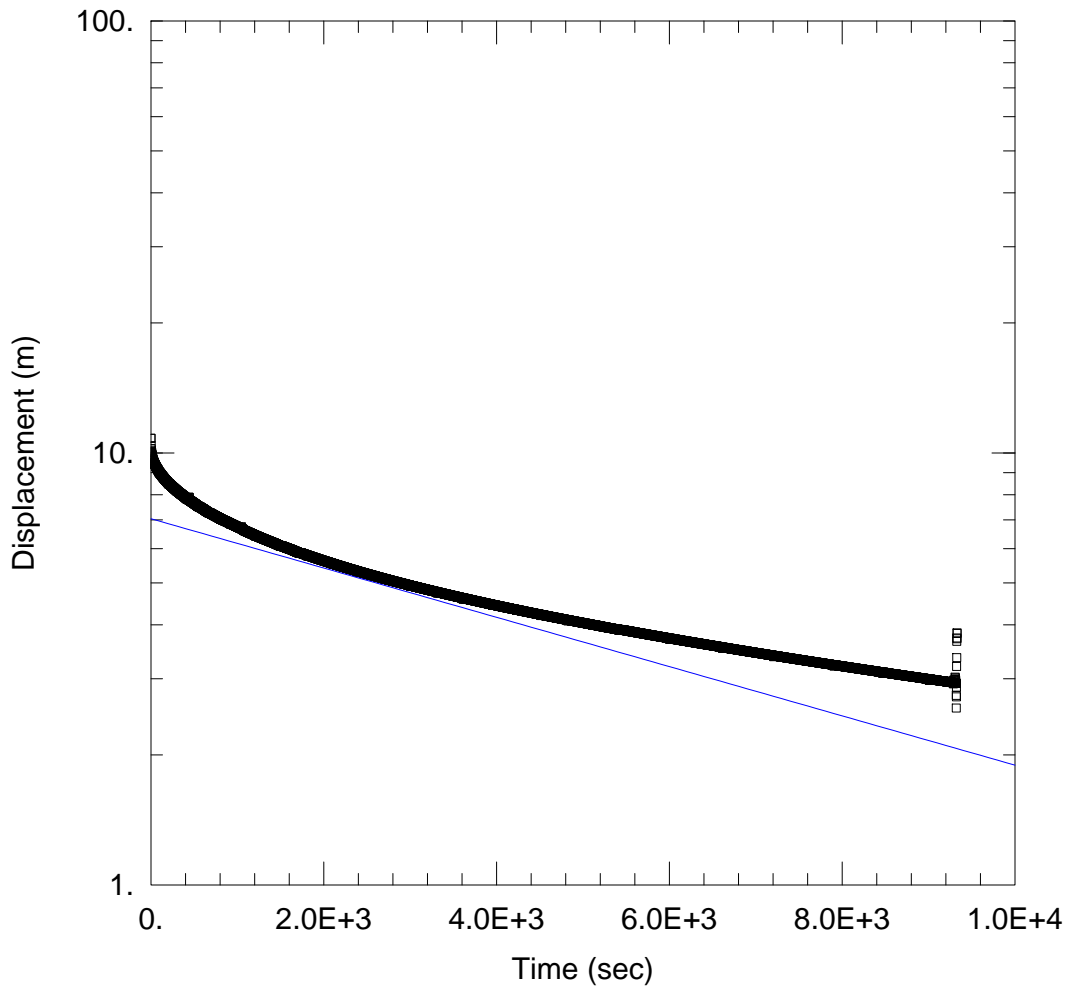
### SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 9.49E-9 m/sec

y0 = 6.993 m



WELL TEST ANALYSIS

Data Set: C:\...\Aqtw1 MW12-05-04 Test2 PosDisp Cut.aqt  
 Date: 03/15/13 Time: 09:49:00

PROJECT INFORMATION

Company: SRK  
 Client: Capstone - Minto  
 Project: 1CM002.008  
 Location: Minto Mine, YT  
 Test Well: MW12-07-01  
 Test Date: November 3, 2012

AQUIFER DATA

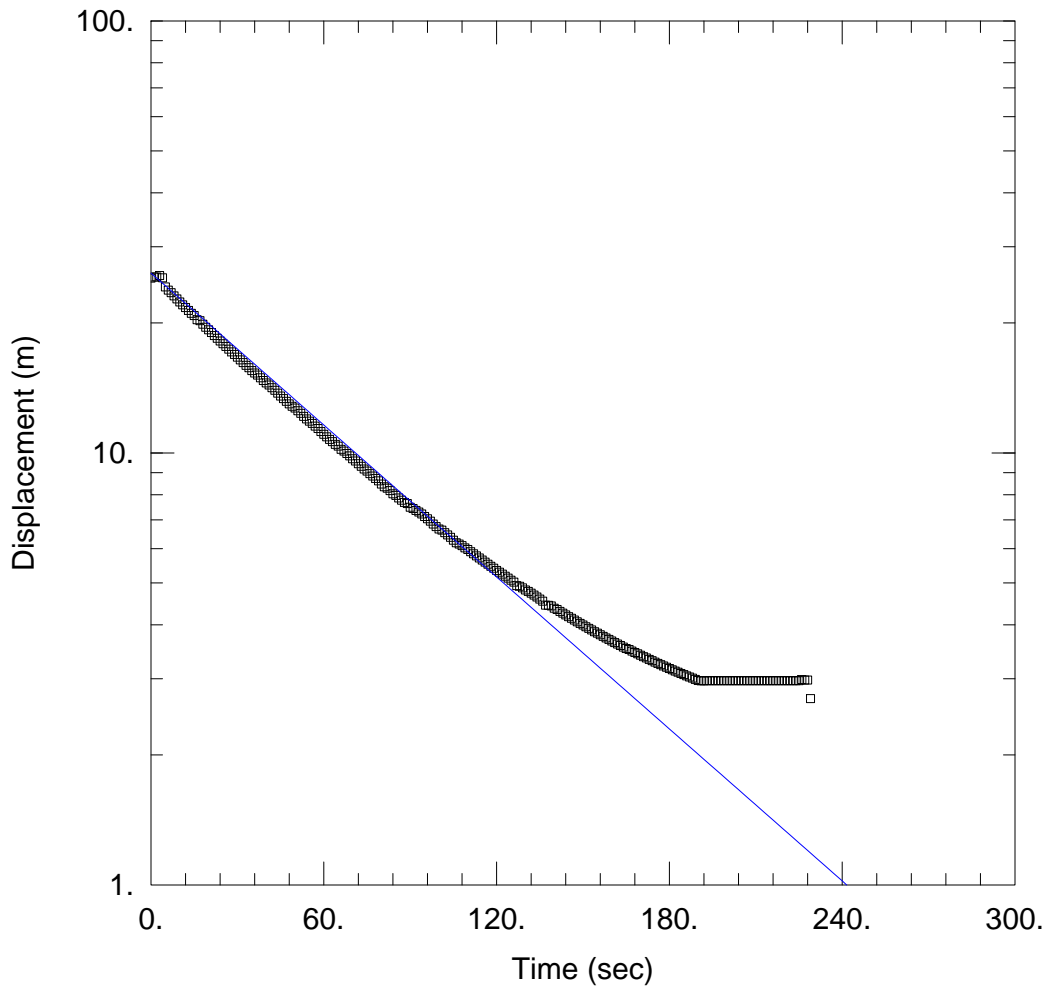
Saturated Thickness: 20.9 m Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW12-05-04 T1)

Initial Displacement: 10.82 m Static Water Column Height: 20.9 m  
 Total Well Penetration Depth: 20.9 m Screen Length: 12. m  
 Casing Radius: 0.019 m Well Radius: 0.3175 m

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice  
 K = 6.144E-9 m/sec y0 = 7.04 m



### RISING HEAD TEST

Data Set: C:\...\Aqtw1 MW12-06-01 Test1 PosDisp Cut rev1.aqt  
 Date: 03/15/13 Time: 09:50:14

### PROJECT INFORMATION

Company: SRK  
 Client: Capstone - Minto  
 Project: 1CM002.008  
 Location: Minto Mine, YT  
 Test Well: MW12-07-01  
 Test Date: October 31, 2012

### AQUIFER DATA

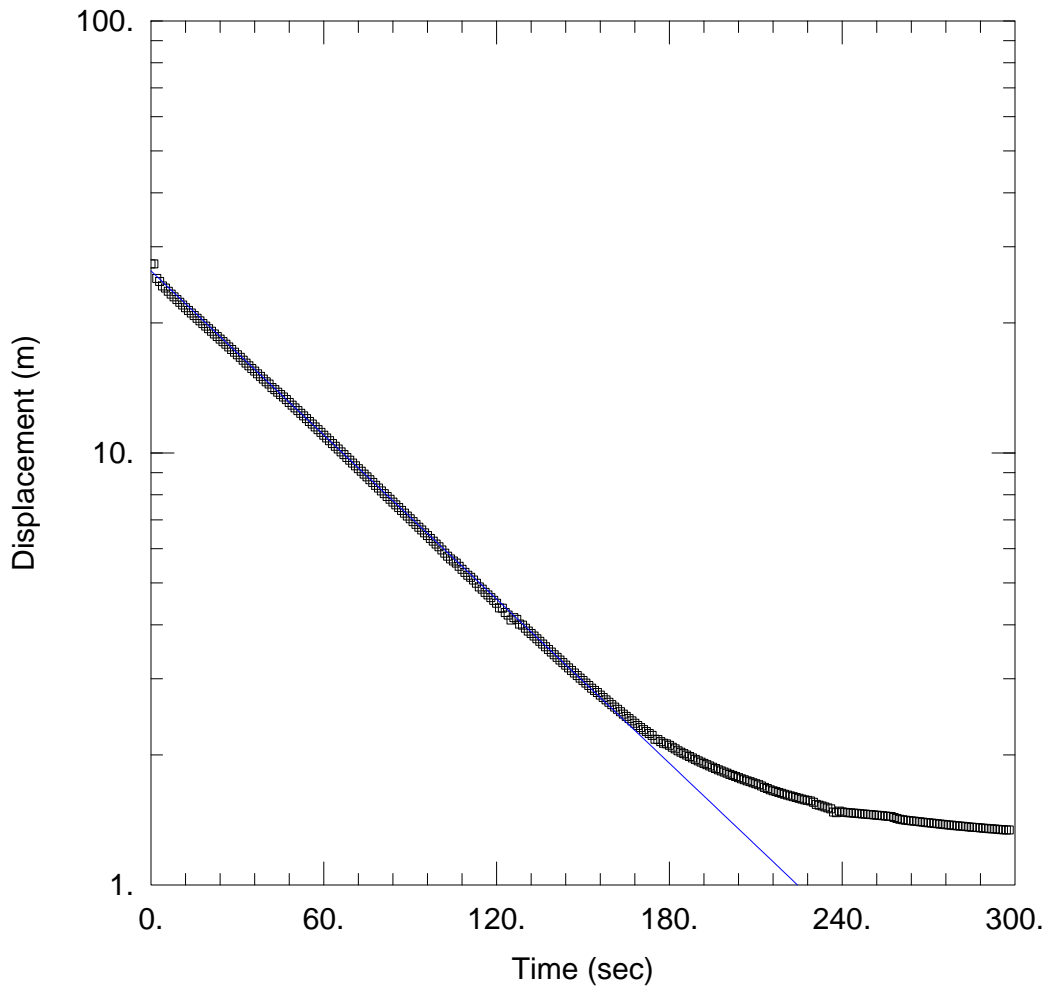
Saturated Thickness: 146.7 m Anisotropy Ratio (Kz/Kr): 1.

### WELL DATA (MW12-06-01)

Initial Displacement: 25.39 m Static Water Column Height: 146.7 m  
 Total Well Penetration Depth: 144.7 m Screen Length: 38. m  
 Casing Radius: 0.019 m Well Radius: 0.03175 m

### SOLUTION

Aquifer Model: Confined Solution Method: Bouwer-Rice  
 K = 4.311E-7 m/sec y0 = 26.08 m



### WELL TEST ANALYSIS

Data Set: C:\...\Aqtw1 MW12-06-02 Test1 PosDisp Cut rev1.aqt  
 Date: 03/15/13 Time: 09:50:55

### PROJECT INFORMATION

Company: SRK  
 Client: Capstone - Minto  
 Project: 1CM002.008  
 Location: Minto Mine, YT  
 Test Well: MW12-07-01  
 Test Date: November 3, 2012

### AQUIFER DATA

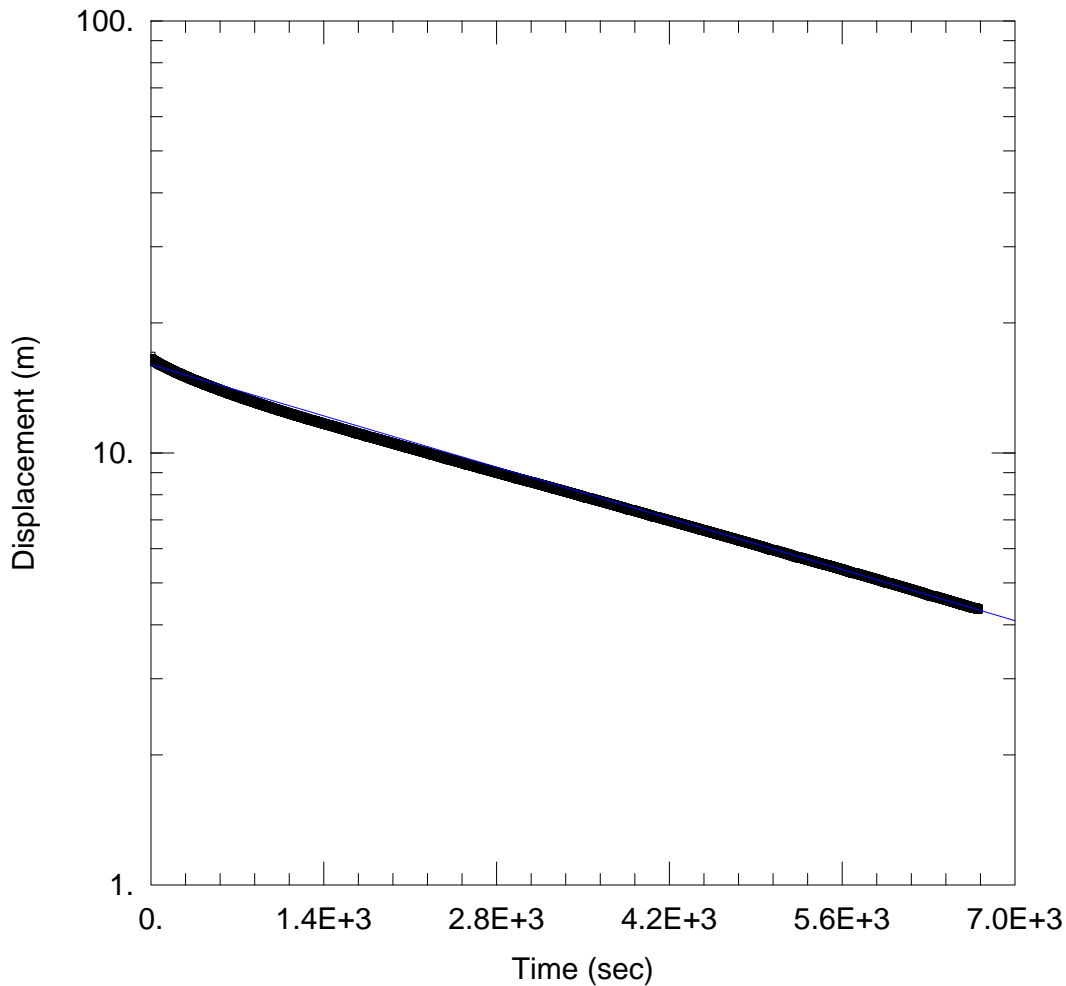
Saturated Thickness: 94.3 m Anisotropy Ratio (Kz/Kr): 1.

### WELL DATA (MW12-06-02)

Initial Displacement: 27.4 m Static Water Column Height: 94.3 m  
 Total Well Penetration Depth: 94.3 m Screen Length: 52. m  
 Casing Radius: 0.019 m Well Radius: 0.3175 m

### SOLUTION

Aquifer Model: Confined Solution Method: Bouwer-Rice  
 K = 2.196E-7 m/sec y0 = 26.38 m



### WELL TEST ANALYSIS

Data Set: C:\...\Aqtw1 MW12-06-03 Test1 PosDisp Cut.aqt

Date: 03/15/13

Time: 09:51:42

### PROJECT INFORMATION

Company: SRK

Client: Capstone - Minto

Project: 1CM002.008

Location: Minto Mine, YT

Test Well: MW12-07-01

Test Date: November 3, 2012

### AQUIFER DATA

Saturated Thickness: 32.5 m

Anisotropy Ratio (Kz/Kr): 1.

### WELL DATA (MW12-06-03)

Initial Displacement: 16.75 m

Static Water Column Height: 32.5 m

Total Well Penetration Depth: 32.5 m

Screen Length: 28. m

Casing Radius: 0.019 m

Well Radius: 0.3175 m

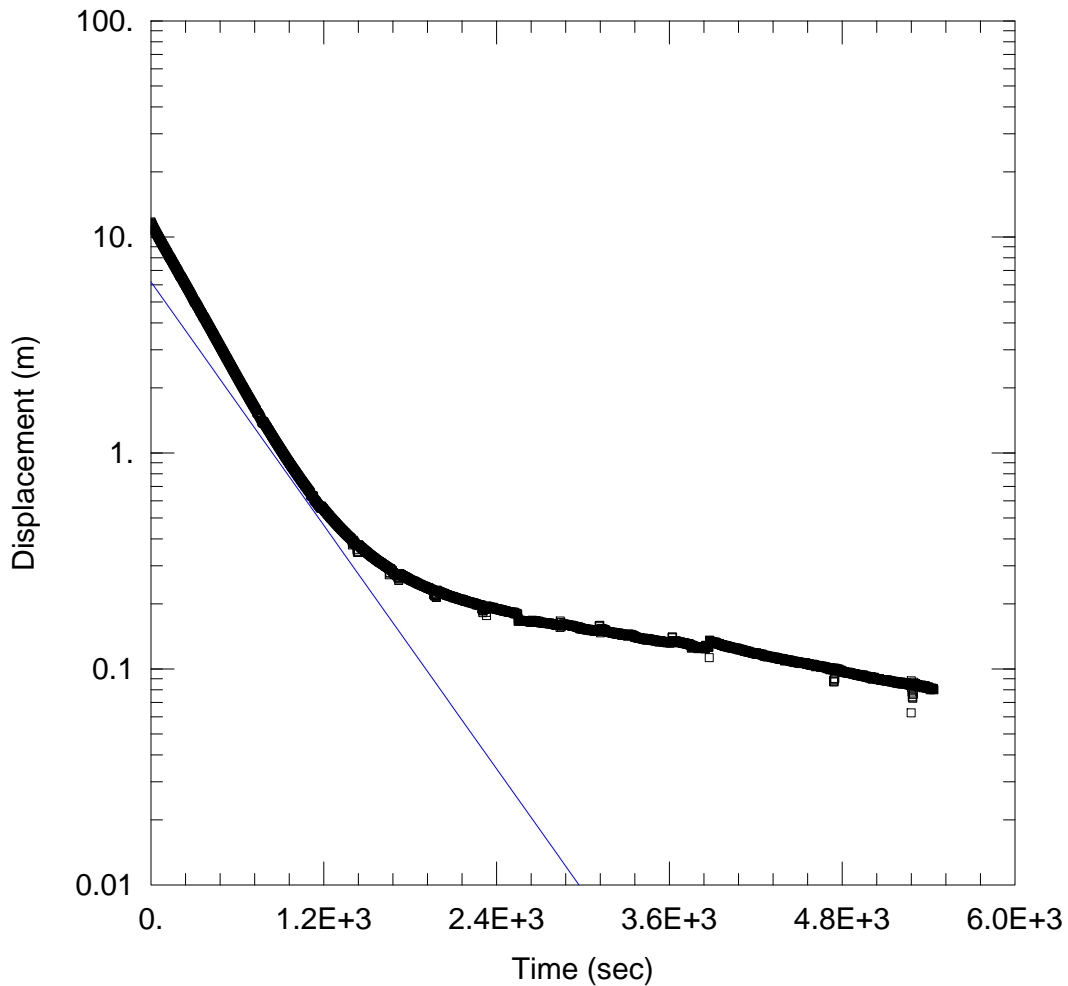
### SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 4.45E-9 m/sec

y0 = 16.01 m



### RISING HEAD TEST

Data Set: C:\...\Aqtw1 MW12-07-01 Test2 PosDisp Cut rev3.aqt

Date: 03/15/13

Time: 09:52:21

### PROJECT INFORMATION

Company: SRK

Client: Capstone - Minto

Project: 1CM002.008

Location: Minto Mine, YT

Test Well: MW12-07-01

Test Date: October 31, 2012

### AQUIFER DATA

Saturated Thickness: 111. m

Anisotropy Ratio (Kz/Kr): 1.

### WELL DATA (MW12-07-01)

Initial Displacement: 11.7 m

Static Water Column Height: 111. m

Total Well Penetration Depth: 111. m

Screen Length: 19. m

Casing Radius: 0.019 m

Well Radius: 0.03175 m

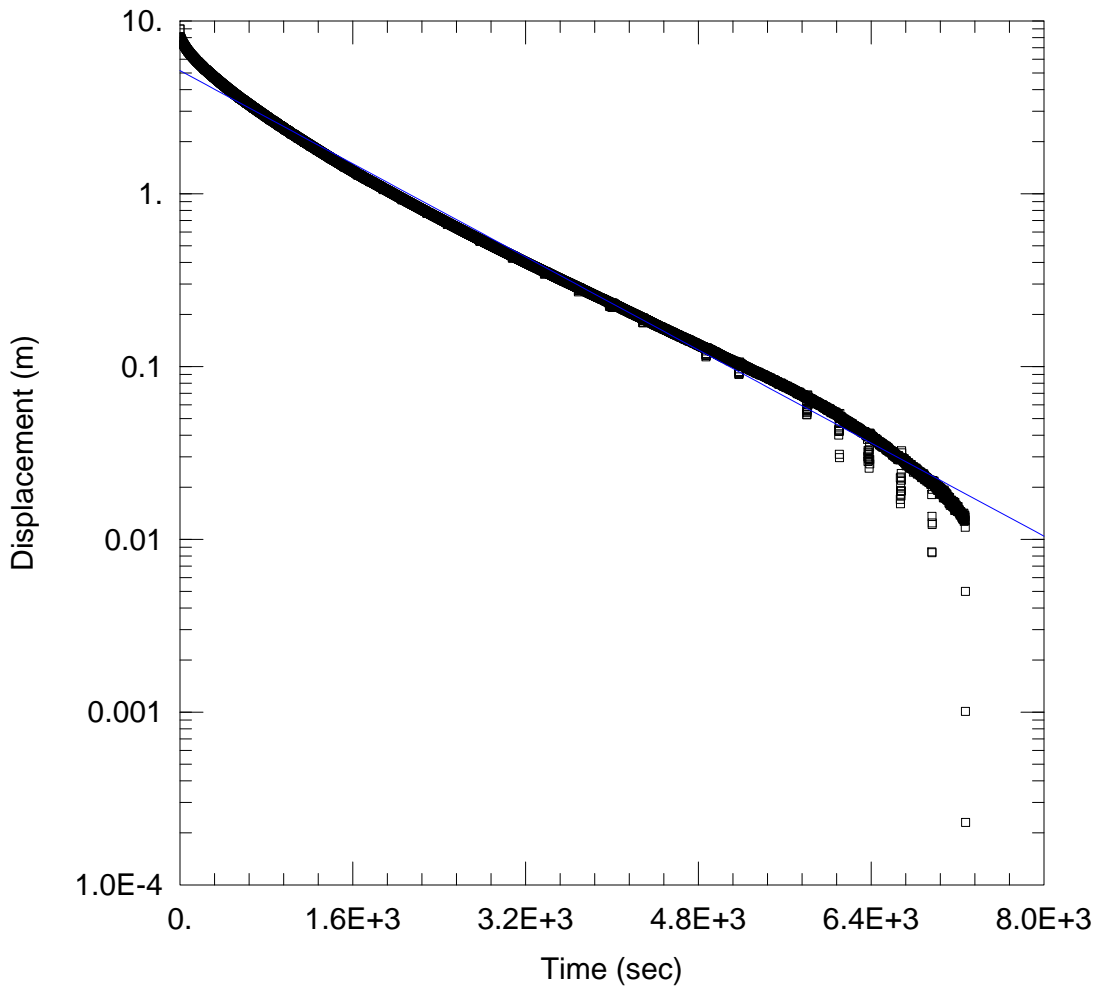
### SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 1.338E-7 m/sec

y0 = 6.188 m



### WELL TEST ANALYSIS

Data Set: C:\...\Aqtw1 MW12-07-02 Test1 PosDisp Cut.aqt

Date: 03/15/13

Time: 09:52:53

### PROJECT INFORMATION

Company: SRK

Client: Capstone - Minto

Project: 1CM002.008

Location: Minto Mine, YT

Test Well: MW12-07-01

Test Date: November 3, 2012

### AQUIFER DATA

Saturated Thickness: 86.42 m

Anisotropy Ratio (Kz/Kr): 1.

### WELL DATA (MW12-07-02)

Initial Displacement: 8.983 m

Static Water Column Height: 86.42 m

Total Well Penetration Depth: 86.42 m

Screen Length: 31. m

Casing Radius: 0.019 m

Well Radius: 0.3175 m

### SOLUTION

Aquifer Model: Unconfined

Solution Method: Bower-Rice

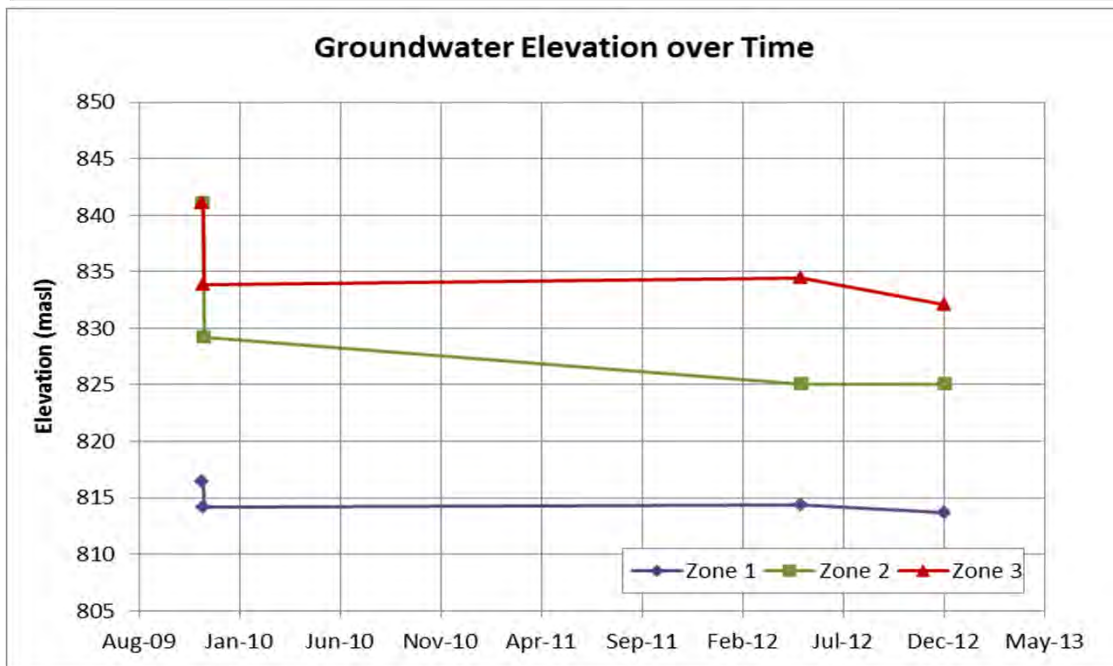
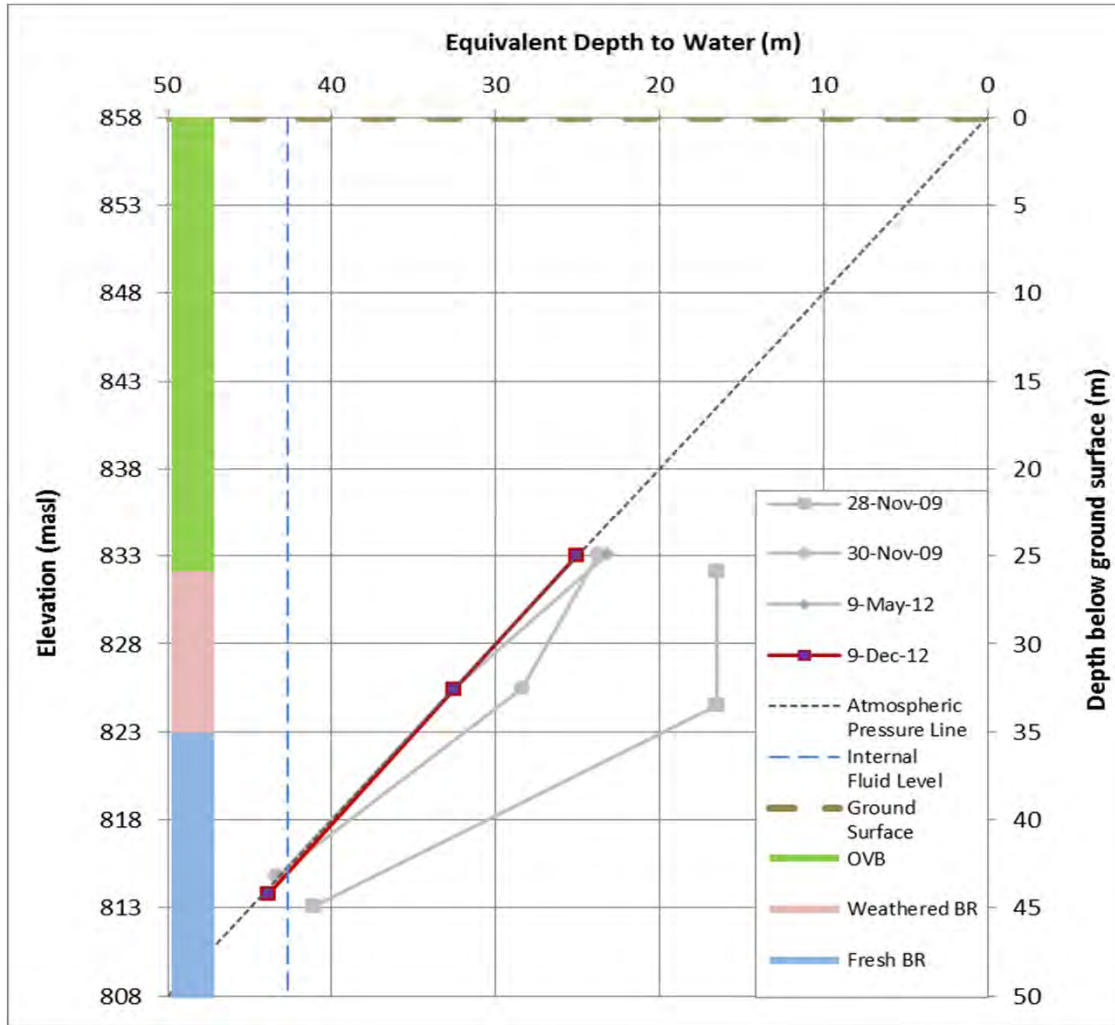
K = 1.883E-8 m/sec

y0 = 5.156 m

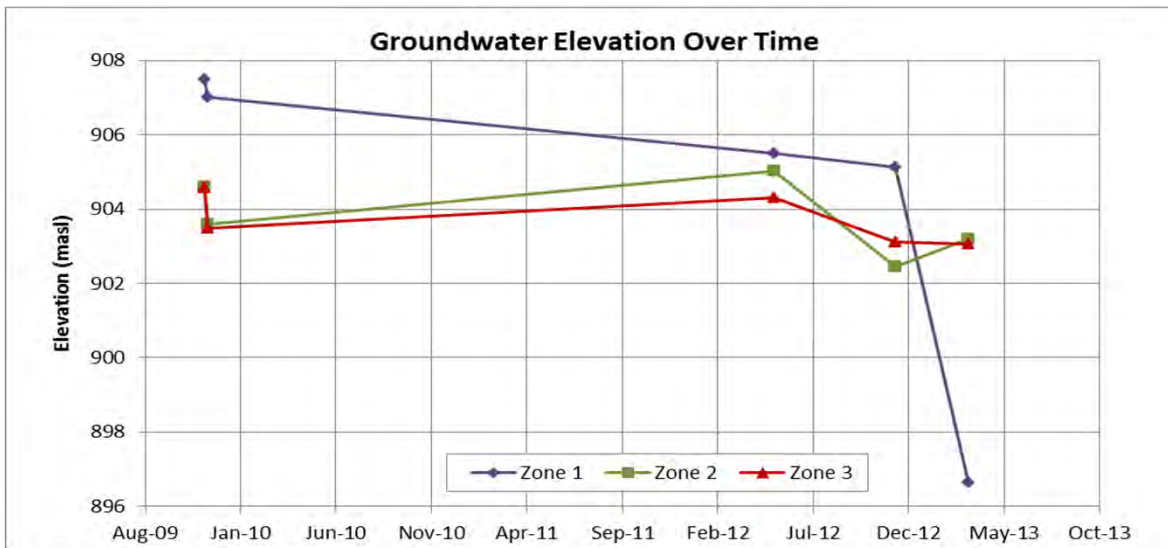
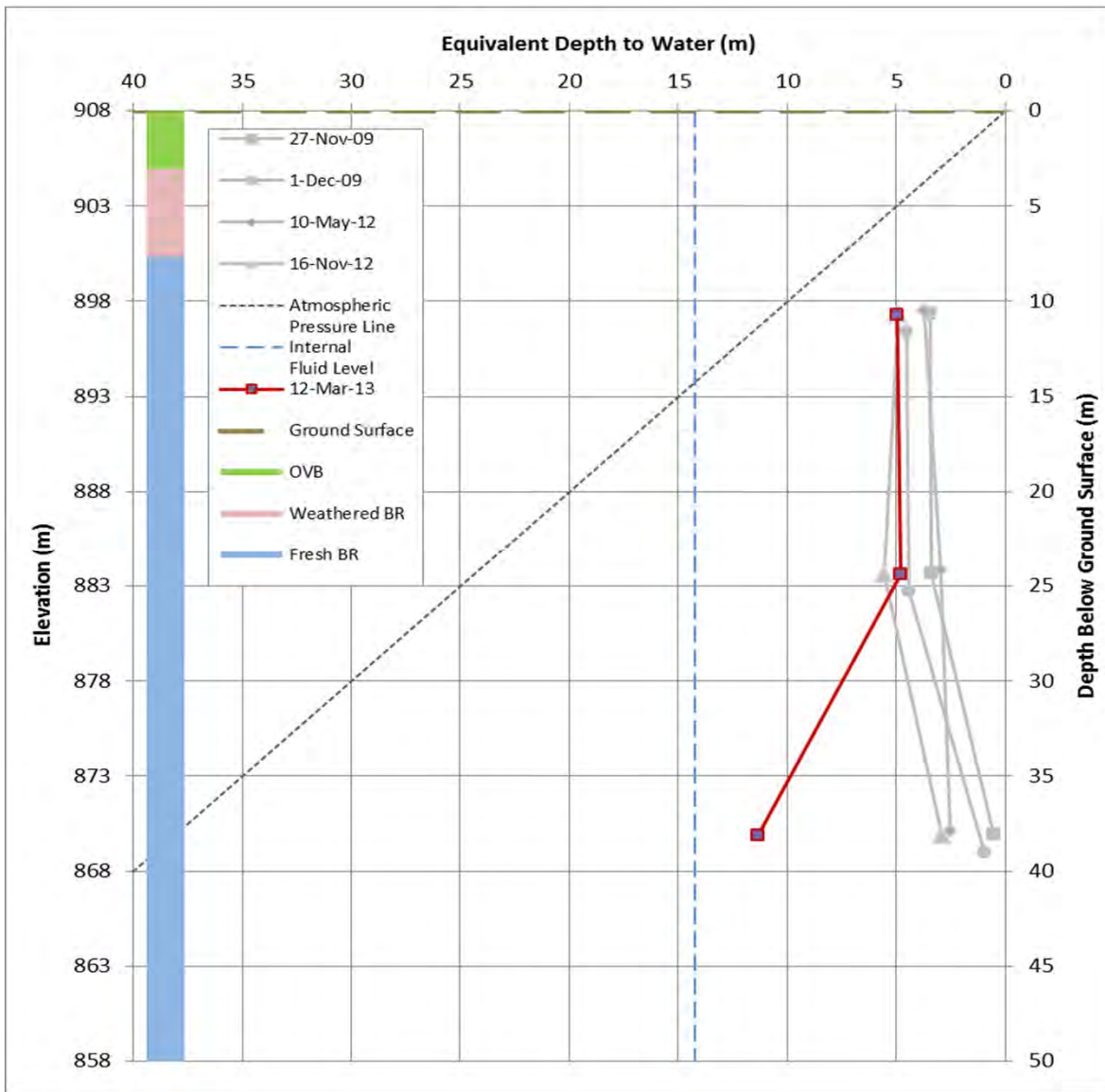
Appendix C: Depth to Water Pressure Profiles in Multi-Port Monitoring Wells



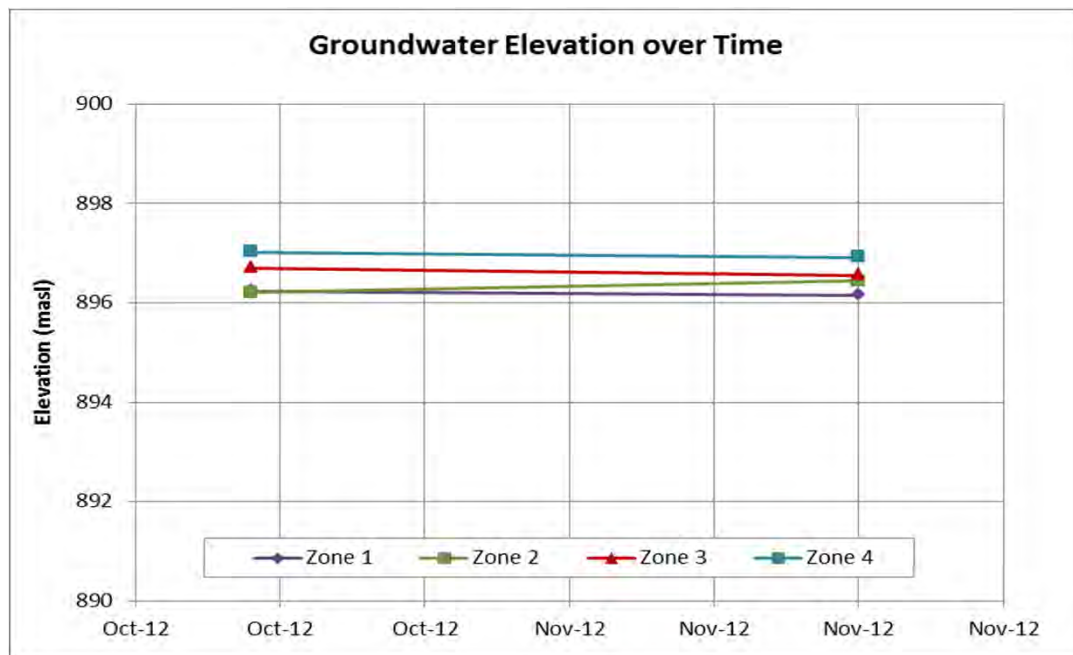
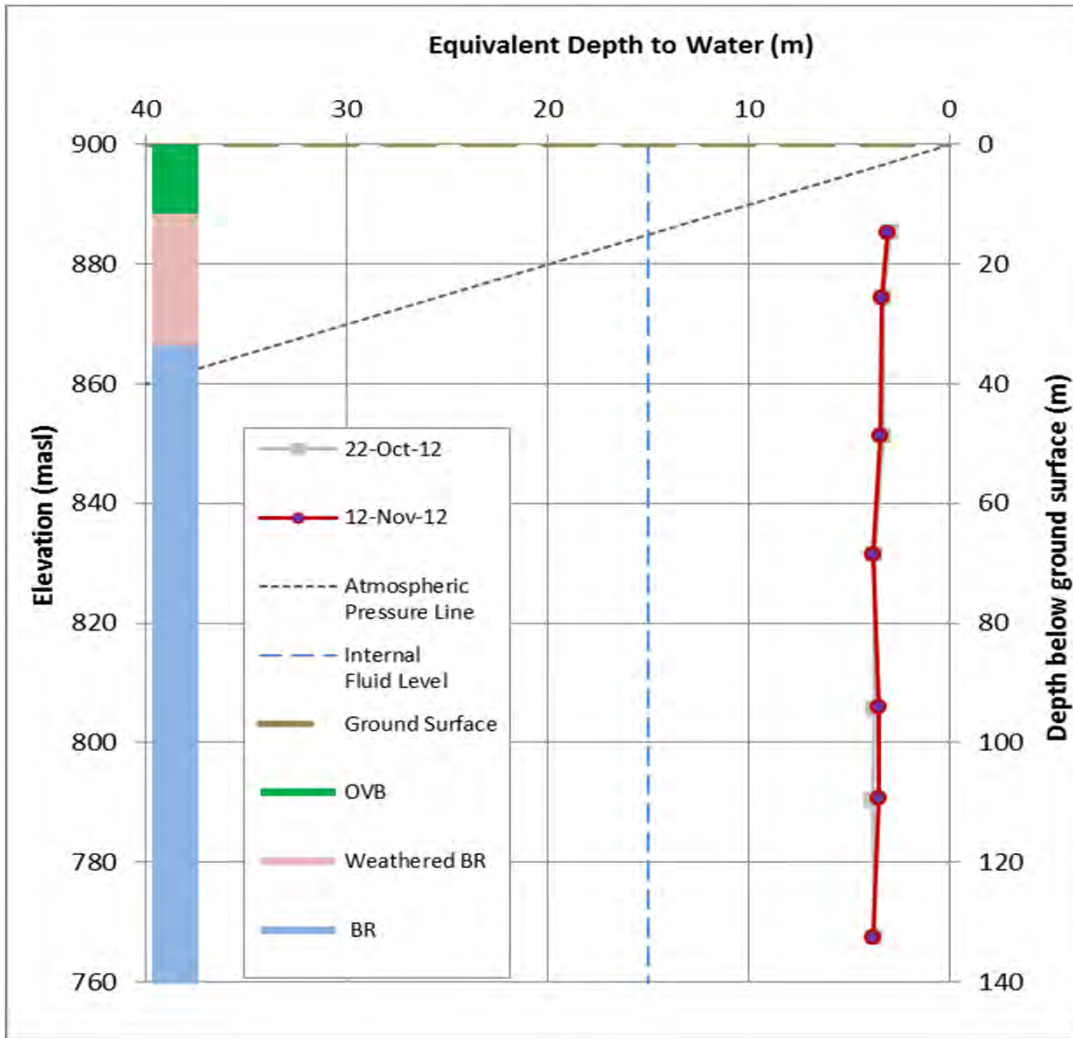
Hole ID : MW-09-01



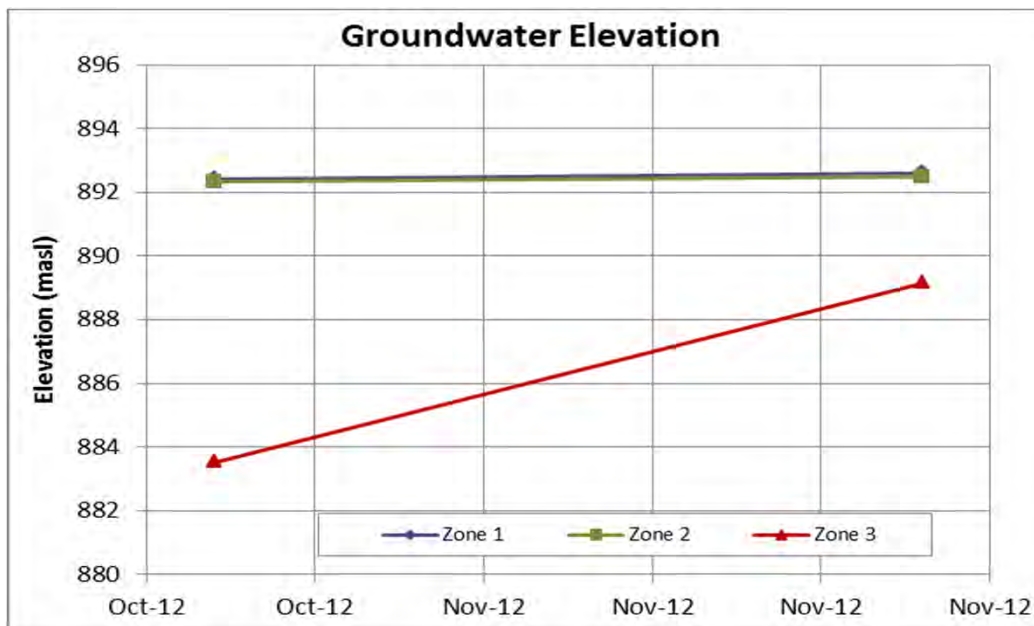
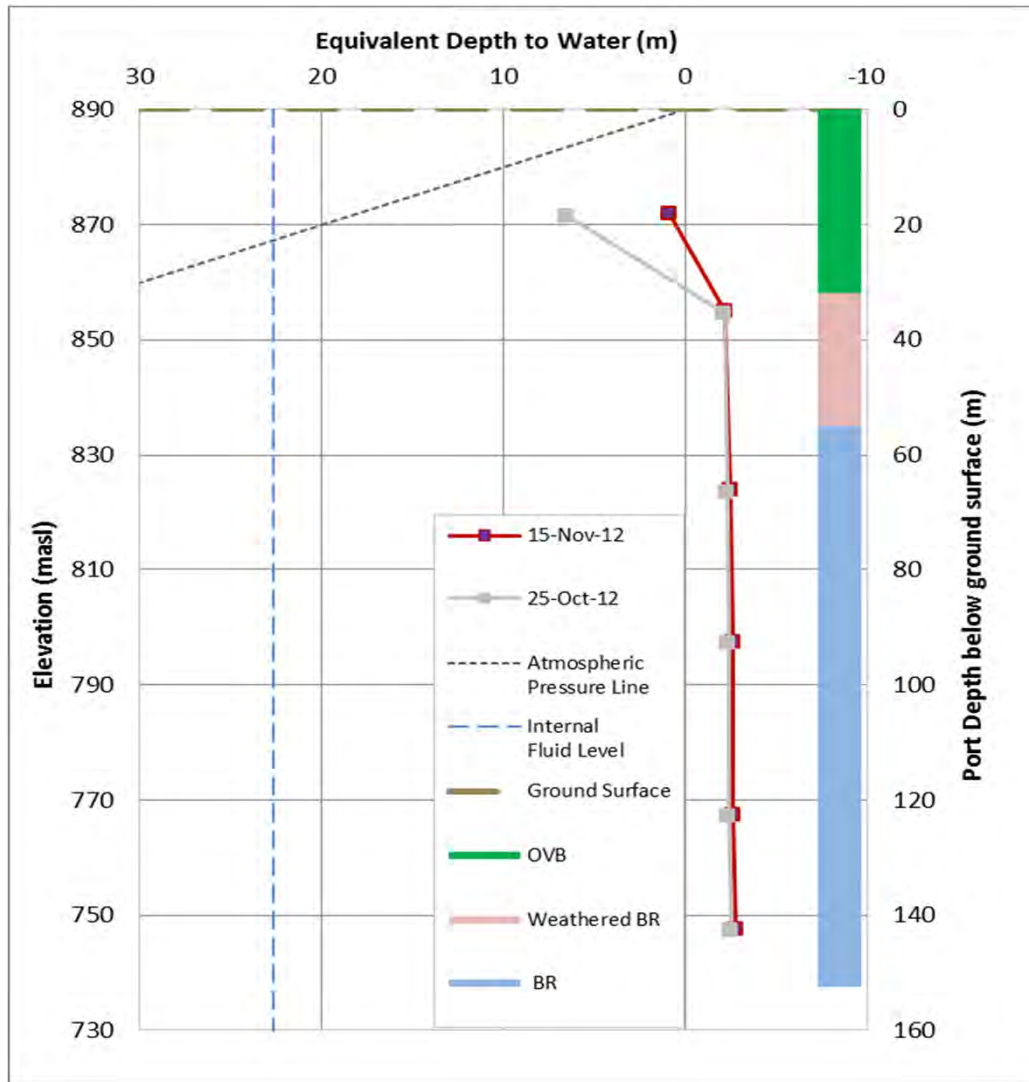
Hole ID : MW-09-03



Hole ID : MW-12-05

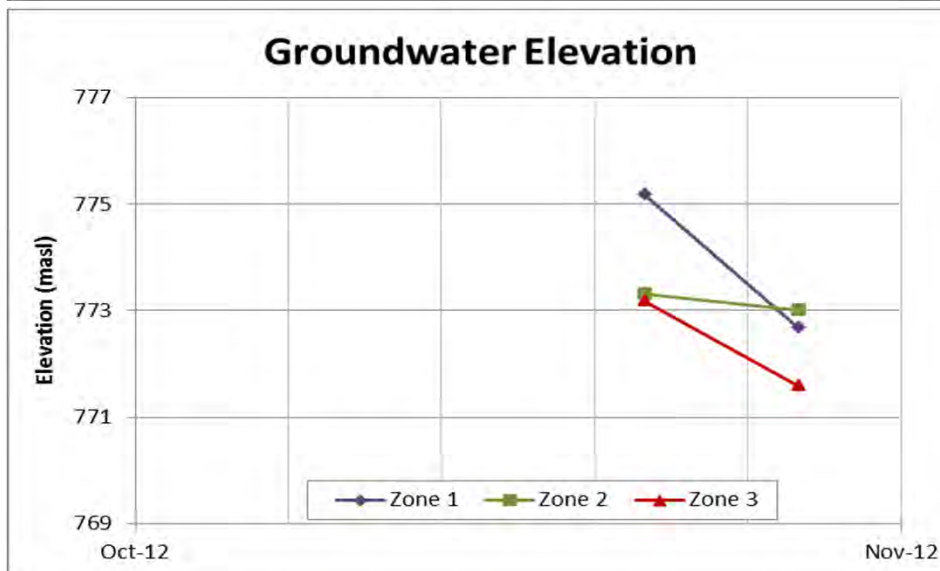
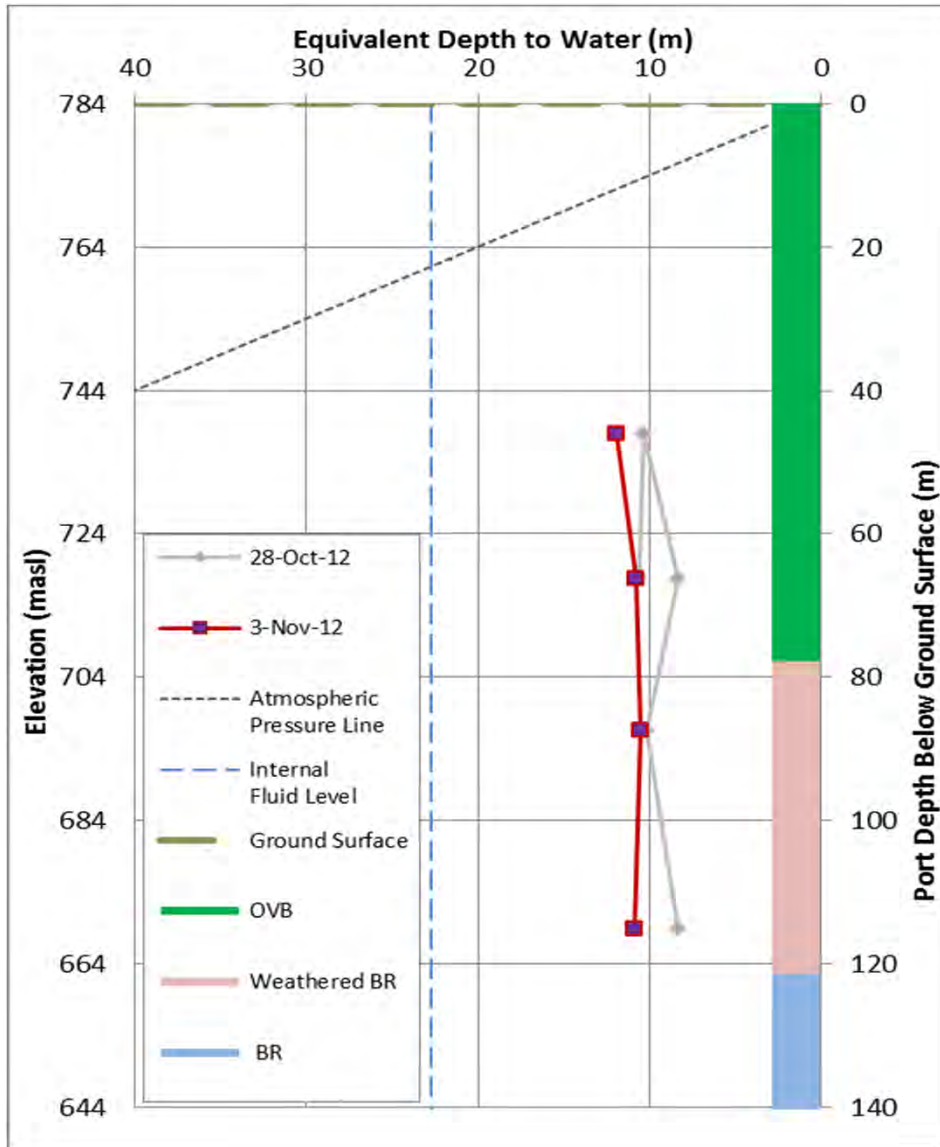


Hole ID : MW-12-06





Hole ID : MW-12-07




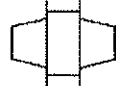
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## Appendix D: Multi-Port Monitoring Well Design


Project: MINTO 2CM022.007.001.10 WB Ref.: \_\_\_\_\_  
 Location: WEST PIT Hole No.: MW09-1 Installed by: JS, CD  
 Hole Depth: 165 FT MP Depth: 165 FT Hole Diameter: HQ Date Installed: 28 NOV '09  
 Measurement Datum: GROUND SURFACE Datum Elevation: 857.6 m Date Drawn: 19 JAN '10


Depth, FT	Geological Description	Geologic Log	MP Casing Log	Serial No. Batch No.	Final Packer Pressure/Volume	Comments	Joint	
							Install	Test
	↑ FILL		18			0.23 m from ground surface to top of piece 17.		
10			17					
20			16					
30			15					
40			14					
50			13					
60			12					
70			11					
80			10					
90	↓ WEATHERED BEDROCK		9	2801				
100			8	17025	600 PSI 6.5 L	VALVE OPEN 170 PSI		


 MP Casing

 MP Packer

 Magnetic Collar  
 Filter Sleeve

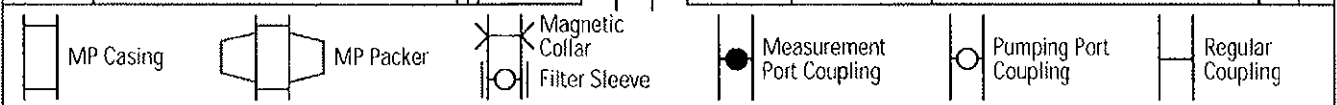
 Measurement Port Coupling

 Pumping Port Coupling

 Regular Coupling

Project: MINTD ZCM027.007.001.10 WB Ref.: \_\_\_\_\_  
 Location: WEST PIT Hole No.: MWD9-1 Installed by: JS, CD  
 Hole Depth: 165 FT MP Depth: 165 FT Hole Diameter: HQ Date Installed: 28 NOV '09  
 Measurement Datum: GROUND SURFACE Datum Elevation: 857.6 m Date Drawn: 19 JAN '10

Depth, FT	Geological Description	Geologic Log	MP Casing Log	Serial No. Batch No.	Final Packer Pressure/Volume	Comments	Joint	
							Install	Test
100	WEATHERED BEDROCK		7					
110			6	2803				
120	COMPETENT BEDROCK		5	7955				
130			4	17026	670 PSI 4.0 L	VALVE OPEN 165 PSI		
140			3	2800				
150			2	7957				
160	END OF HOLE AT 165 FT		1					
170								



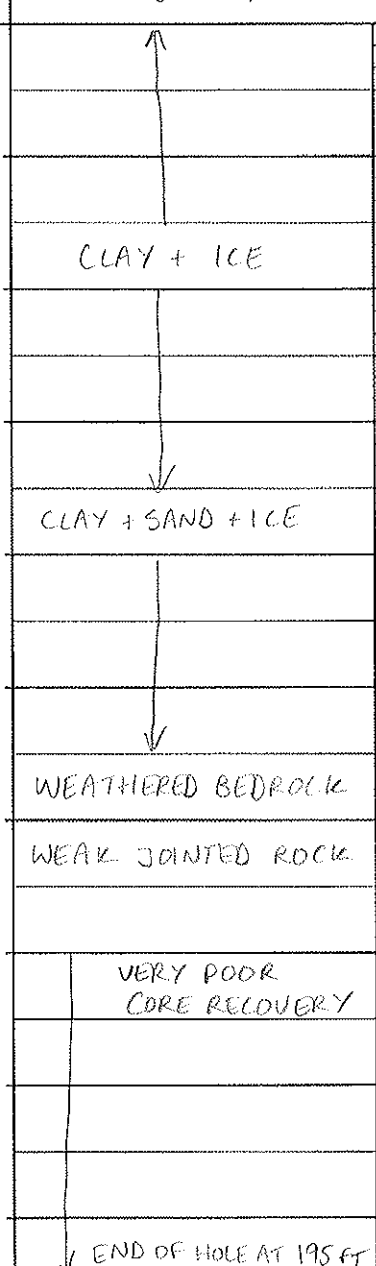


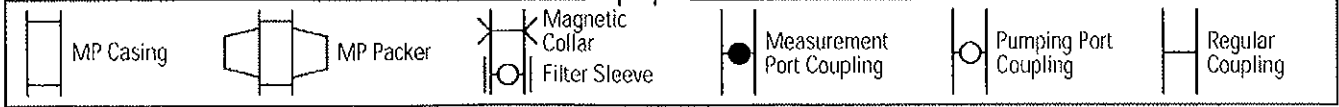
Project: MINTO 2CM022.007.001.10 WB Ref.: \_\_\_\_\_  
 Location: LOWER TAILINGS Hole No.: MW09-2 Installed by: JS, CD  
 Hole Depth: 195 FT MP Depth: 195 FT Hole Diameter: HQ Date Installed: 26 NOV '09  
 Measurement Datum: GROUND SURFACE Datum Elevation: 757.5 m Date Drawn: 19 JAN '10

Depth, FT	Geological Description	Geologic Log	MP Casing Log	Serial No. Batch No.	Final Packer Pressure/Volume	Comments	Joint	
							Install	Test
10			22					
20	CLAY + ICE PERMAFROST		21					
30			20					
40			19					
50			18					
60			17					
70			16					
80			15					
90			14					
100			13					



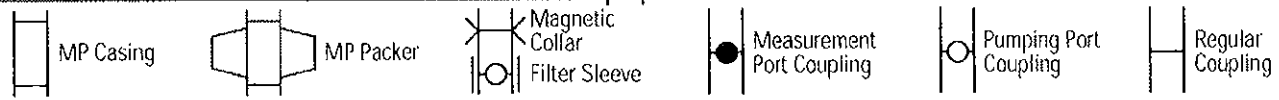
Project: MINTO 2CM022.007.001.10 WB Ref.: \_\_\_\_\_  
 Location: LOWER TAILINGS Hole No.: MW09-2 Installed by: JS, CD  
 Hole Depth: 195 FT MP Depth: 195 FT Hole Diameter: HQ Date Installed: 26 NOV '09  
 Measurement Datum: GROUND SURFACE Datum Elevation: 757.5 m Date Drawn: 19 JAN '10

Depth, FT	Geological Description	Geologic Log	MP Casing Log	Serial No. Batch No.	Final Packer Pressure/Volume	Comments	Joint		
							Install	Test	
100	 <p>CLAY + ICE</p> <p>CLAY + SAND + ICE</p> <p>WEATHERED BEDROCK</p> <p>WEAK JOINTED ROCK</p> <p>VERY POOR CORE RECOVERY</p> <p>END OF HOLE AT 195 FT</p>		12						
110			11						
120			10						
130			9						
140			8						
150			7	M	17022	760 PSI 4.75 L	MAG COLLAR AT TOP OF PACKER		
160			6		2799				
170			5		7958				
180			4	M	17021	760 PSI 1.75 L	MAG COLLAR AT TOP OF PACKER		
190			3		2794				
200	2		7951						
	1								



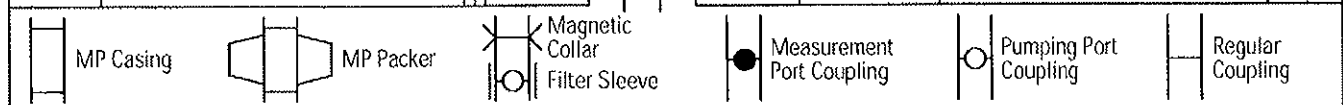
Project: MINTO 2CM027.007.001.10 WB Ref.: \_\_\_\_\_  
 Location: MINTO NORTH Hole No.: MW09-3 Installed by: JS, CD  
 Hole Depth: 165 FT MP Depth: 165 FT Hole Diameter: HQ Date Installed: 27 NOV '09  
 Measurement Datum: GROUND SURFACE Datum Elevation: 908.0 m Date Drawn: 19 JAN '10

Depth, FT	Geological Description	Geologic Log	MP Casing Log	Serial No. Batch No.	Final Packer Pressure/Volume	Comments	Joint	
							Install	Test
	WELL CASING		18			2.9 m from top of casing to top of piece 17.		
10	WEATHERED BEDROCK		17					
20	COMPETENT ROCK		16	17023	740 PSI 3.9 L	VALVE OPEN 170 PSI		
30			15					
40	STAINED JOINTS, ALTERATION		14	2805				
50			13	7956				
60			12	17028	740 PSI 3.75 L	VALVE OPEN 165 PSI		
70			11					
80			10					
80			9	2802				
90	R2 ROCK, HIGHLY ALTERED		8	7949				
100								



Project: MINTO 2CM027.007.001.10 WB Ref.: \_\_\_\_\_  
 Location: MINTO NORTH Hole No.: MW09-3 Installed by: JS, CD  
 Hole Depth: 165 FT MP Depth: 165 FT Hole Diameter: HQ Date Installed: 27 NOV '09  
 Measurement Datum: GROUND SURFACE Datum Elevation: 908.0 m Date Drawn: 19 JAN '10

Depth	Geological Description	Geologic Log	MP Casing Log	Serial No. Batch No.	Final Packer Pressure/Volume	Comments	Joint	
							Install	Test
100	COMPETENT BEDROCK		7	17027	750 PSI 3.75 L	VALVE OPEN 170 PSI		
110			6					
120								
130			M75K 4	2804				
140			0	7950				
150			3					
160	END OF HOLE 165'		2					
170			1					



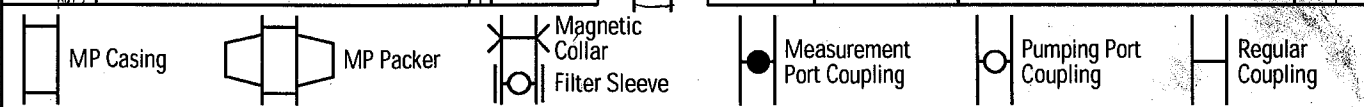
Project: Minto 2CM022.007 WB Ref.: \_\_\_\_\_

Location: Phase 1 confluence Hole No.: MW09-4 Installed by: M. Royle / J. Scib  
C. Dougherty

Hole Depth: 250 FT MP Depth: 250 FT Hole Diameter: HLR Date Installed: Nov 24 '09

Measurement Datum: \_\_\_\_\_ Datum Elevation: \_\_\_\_\_ Date Drawn: Nov 24 '09

Depth,	Geological Description	m ↓ FT	Geologic Log	MP Casing Log	Serial No. Batch No.	Final Packer Pressure/Volume	Comments	Joint	
								Install	Test
5			✓	27					
10									
15			✓	26					
20									
25			✓	25					
30									
35			✓	24					
40									
45			✓	23					
50									
55			✓	22					
60									
65			✓	21					
70									
75			✓	20					
80									
85			✓	19					
90									
95			✓	18					



Project: Minto 2CM022.007.001.100 WB Ref.: \_\_\_\_\_

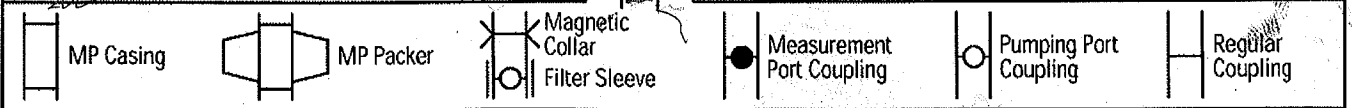
 Location: Phase 1 confluence Hole No.: MWD9-4 Installed by: M. Royle / J. Scibel  
c. Doughty

 Hole Depth: 250 FT MP Depth: 250 FT Hole Diameter: HQ Date Installed: Nov 24 '09

 Measurement Datum: ground surface Datum Elevation: \_\_\_\_\_ Date Drawn: Nov 24 '09

Depth	Geological Description	Geologic Log	MP Casing Log	Serial No. Batch No.	Final Packer Pressure/Volume	Comments	Joint	
							Install	Test
105	↓ mostly diamict (14 ft) or firm frozen clay	✓	17					
110		✓	16					
115	with ice inclusions	✓	15					
120	note: clayey fine sand (frozen)	✓	14					
125		✓	13			W <sub>f</sub> = 74.52 m - 5 FT stuck (below ground) after install (30 min)		
130		✓	12					
135	small ice layer at 136.5'	✓	11					
140	firm clay diamict (compacted) - frozen	V <sub>0</sub> = 165 V <sub>r</sub> = 140	10					
145	highly weathered bedrock crumbly, clayey	✓	9					
150		✓ M	8			mag. collar		
155	weath. altered bedrock, RZ strength, core jointed	✓	7	2798				
160		✓	6					
165		✓	5	7954				
170		✓	4					
175		✓	3					
180	strong rock, jointed	✓ M	2	17031 2797		mag collar on bottom of packer		
185		✓	1					
190		✓	0	7953				
195		✓	0					
200								

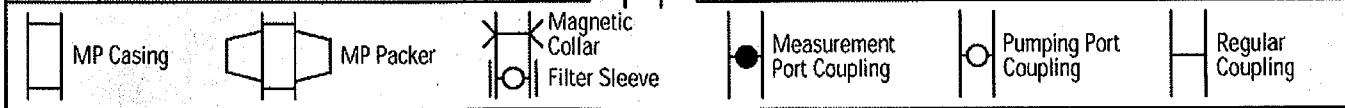
Nov 25  
15:35  
bottom  
2 packers  
inflated  
with  
HQ shoe  
at 160 ft



Project: Minto 2CM022.007 WB Ref.: \_\_\_\_\_  
 Location: Phase 1 confluence Hole No.: MWD9-4 Installed by: M. Royle/J. Scribek/C. Doughty  
 Hole Depth: 250 FT MP Depth: 250 FT Hole Diameter: HR Date Installed: Nov 24 '09  
 Measurement Datum: ground surface Datum Elevation: \_\_\_\_\_ Date Drawn: Nov 24 '09

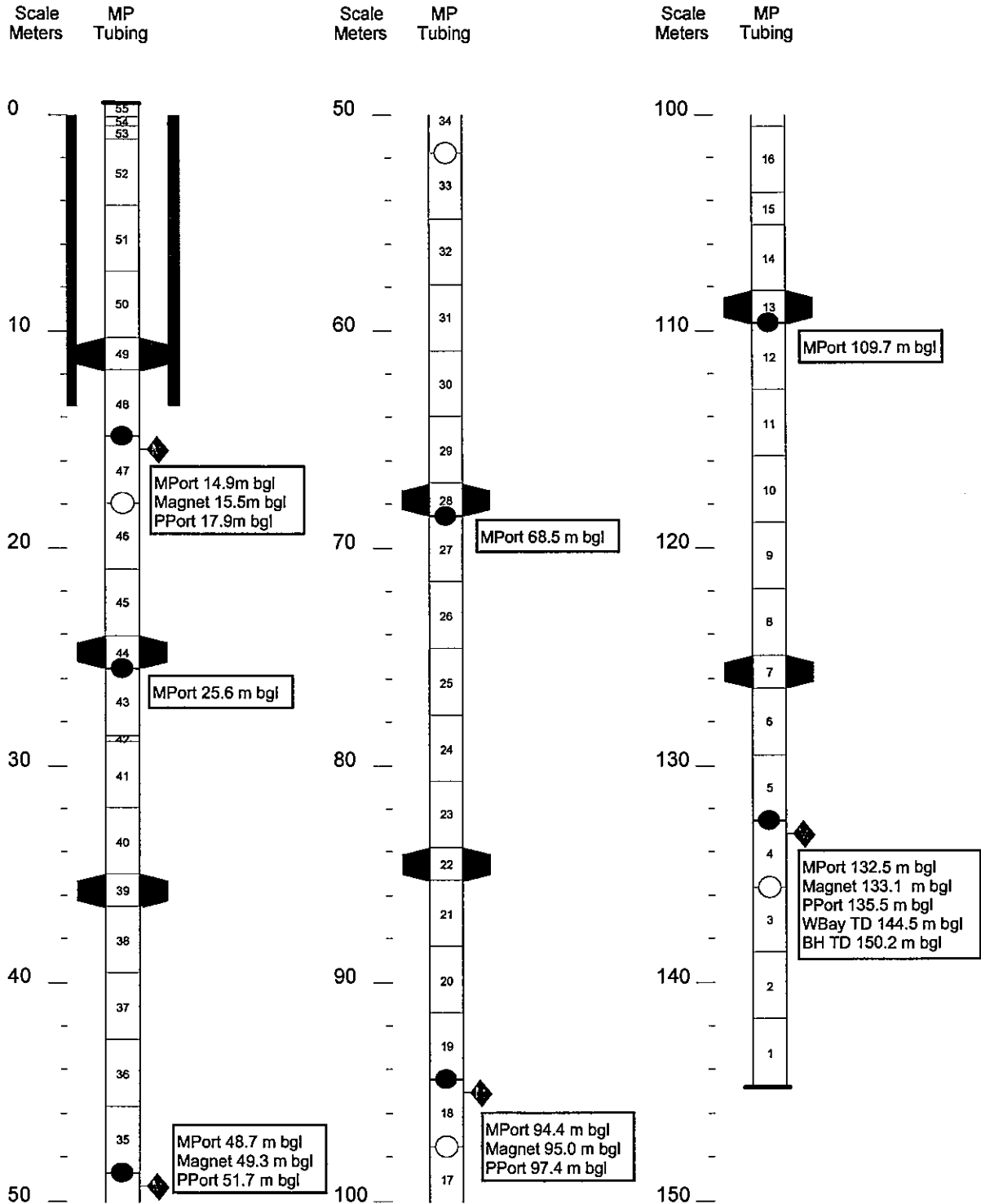
U.HQ

Depth	Geological Description	Geologic Log	MP Casing Log	Serial No. Batch No.	Final Packer Pressure/Volume	Comments	Joint	
							Install	Test
205	strong rock, jointed		6	17024				
210		1/8" TO 1/4" SD	5			don't put packer below 205'		
215								
220			4					
225			3	M 2796		mag-collar		
230								
235			0	7952				
240				7952				
245	EDH at 243'	EDH				end cap		
250	EDH at 250'					drill hole w.l. = ?		
						measure before install		
						probed hole = 243.1'		
						shortened orig design by 5' by remains		
						#2 pipe (5ft)		



Summary Casing Log  
Schlumberger/SRK

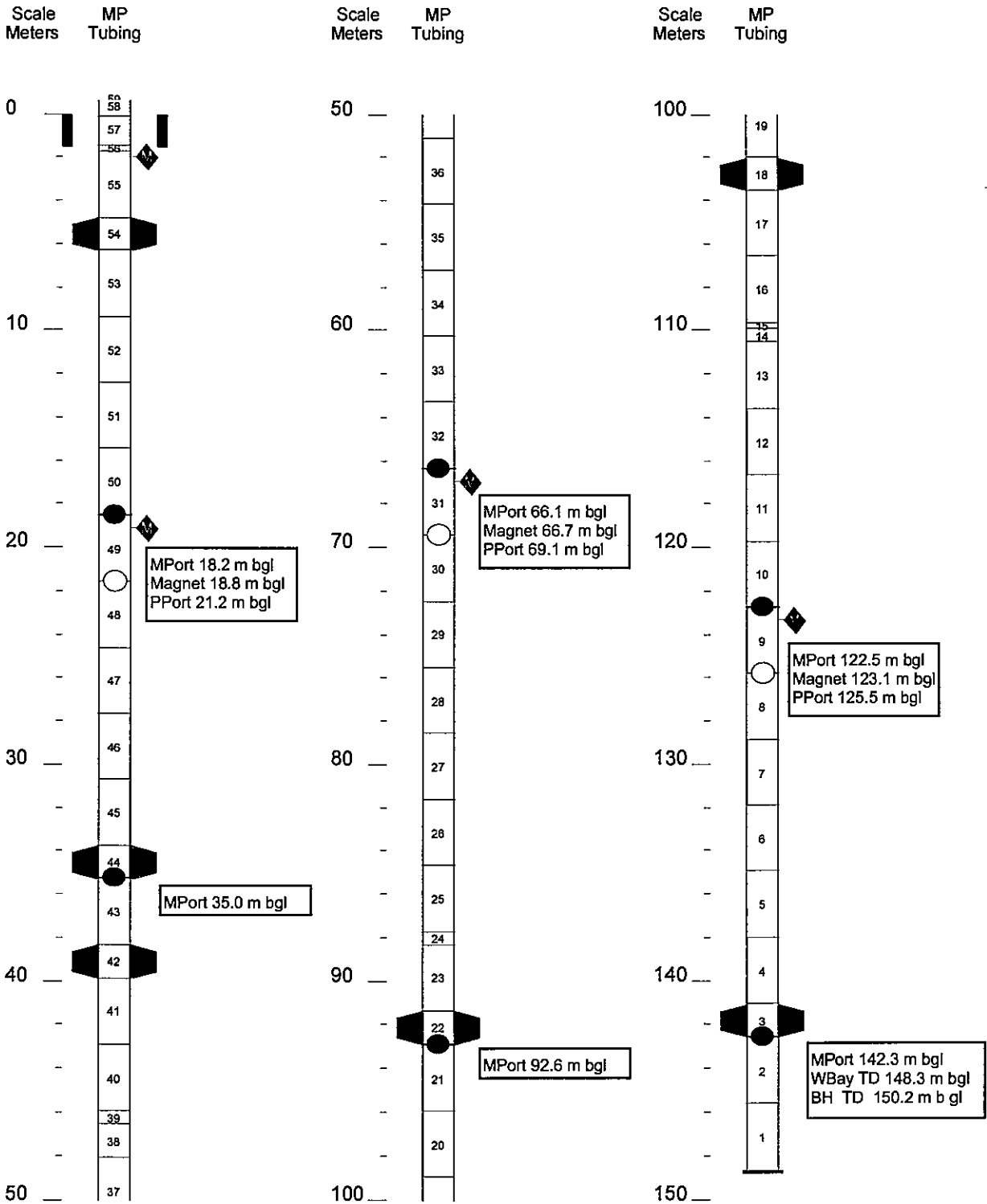
Job No: WB890  
Well: MW12-05



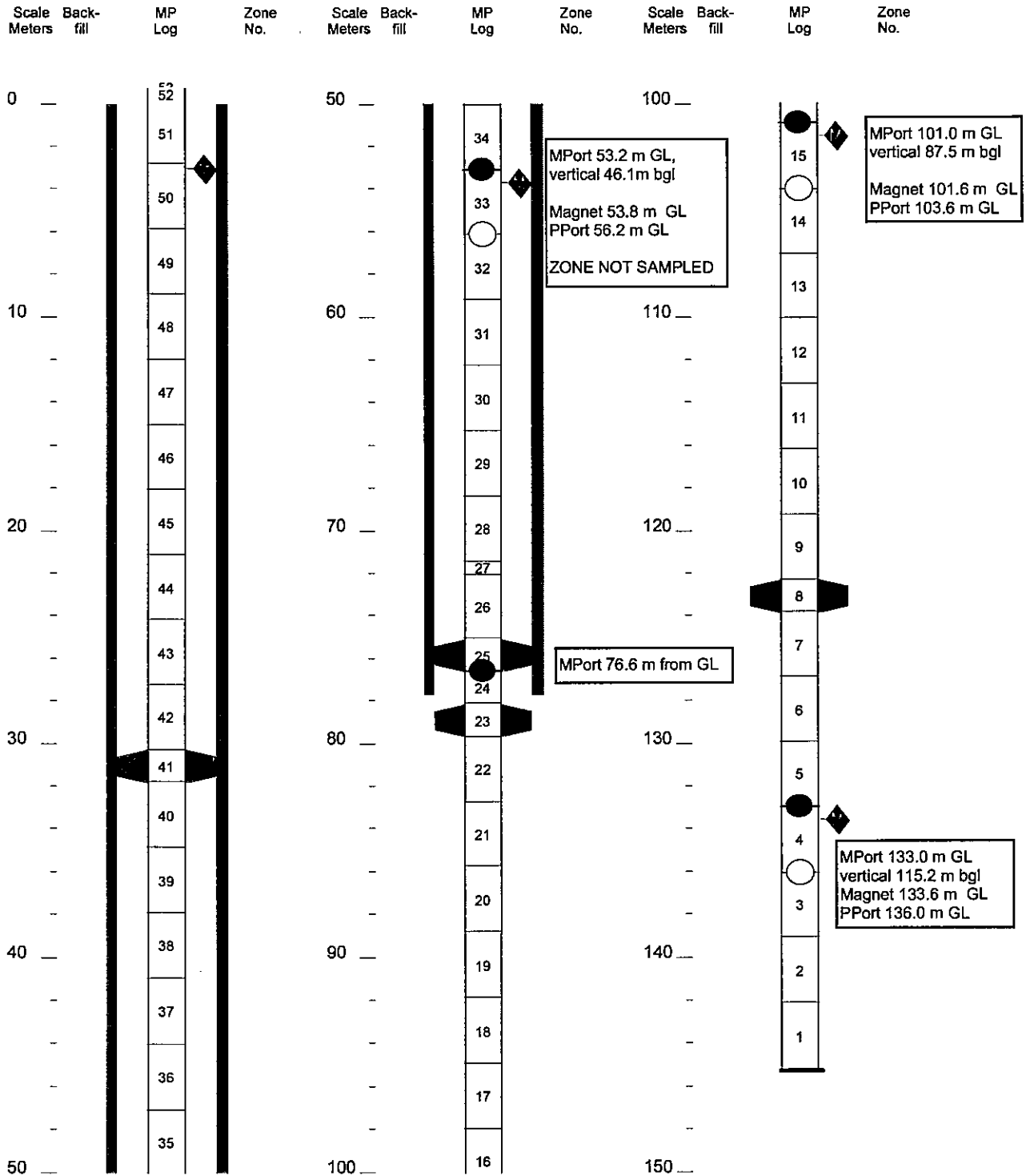


Summary Casing Log  
Schlumberger/SRK

Job No: WB890  
Well: MW12-06



BOREHOLE PLUNGE ANGLE 60 DEGREES BELOW HORIZONTAL. PORT POSITIONS GIVEN ALONG PLUNGE LINE, EQUIVALENT VERTICAL DEPTH CALCULATED BASED ON PLUNGE ANGLE.



## Appendix E: Groundwater Chemistry Data

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Well ID	Zone	Date	Parameters (mg/L)															
			Ag-D	Ag-T	Al-D	Alk-Bicrb	Alk-Carb	Alk-OH	Alk-P	Alk-T	Al-T	Ammonia	Ammonium	As-D	As-T	Ba-D	Ba-T	B-D
MW09-01	2	11/30/2009	0.00019	0.00037	0.006	140	<6	<5		112	0.141		0.72	0.0002	0.0003	0.034	0.037	0.045
MW09-01	3	11/30/2009	<0.00001	0.00013	0.007	100	<6	<5		100	1.46		3.85	0.0002	0.0009	0.1	0.138	0.052
MW09-01	3	3/30/2010	<0.00001	0.00012	0.048	220	<6	<5		184	1.31		6.16	0.0007	0.0012	0.142	0.186	0.095
MW09-01	4	11/30/2009	0.00002	0.00013	<0.005	100	<6	<5		100	1.02		3.03	0.0003	0.0007	0.095	0.122	0.044
MW09-02	1	12/2/2009	<0.00001	0.00024	0.01	400	<6	<5		329	1.03		1.29	0.0041	0.0053	0.11	0.136	5.37
MW09-02	3	12/2/2009	<0.00001	0.00019	<0.005	410	<6	<5		333	0.765		1.26	0.0047	0.005	0.111	0.132	6.09
MW09-03	1	12/1/2009	0.00005	0.0104	0.01	100	<6	<5		93	15.3		5.79	0.0009	0.0068	0.106	1.35	0.32
MW09-03	1	3/29/2010	<0.00001	0.00006	<0.005	170	<6	<5		137	0.043		0.35	0.0002	0.0004	0.047	0.05	0.106
MW09-03	1	5/10/2012	<0.000020		0.0054	162	<0.50	<0.50	<0.50	133		0.073		<0.00010		0.0445		0.143
MW09-03	1	11/17/2012	<0.0000050		0.00492	164	<0.50	<0.50	<0.50	134		0.12		0.000037		0.0485		0.12
MW09-03	2	12/1/2009	0.00004	0.00613	0.008	100	<6	<5		85	3.85		5.32	0.0008	0.0007	0.088	0.183	0.218
MW09-03	2	3/29/2010	0.00001	0.00017	<0.005	160	<6	<5		130	0.03		0.99	0.0012	0.0015	0.035	0.036	1.99
MW09-03	2	5/10/2012	<0.000020		0.013	566	<0.50	<0.50	<0.50	464		0.23		0.00072		0.774		0.375
MW09-03	2	11/17/2012	<0.000025		0.0041	599	<0.50	<0.50	<0.50	491		0.23		0.00076		0.692		0.387
MW09-03	3	12/1/2009	0.00001	0.00154	0.007	70	<6	<5		55	0.681		0.26	0.0002	<0.0002	0.011	0.028	0.044
MW09-03	3	3/29/2010	<0.00001	0.00004	<0.005	80	<6	<5		63	0.01		<0.05	<0.0002	<0.0002	0.013	0.013	0.04
MW09-03	3	5/10/2012	<0.000020		0.0035	95.9	<0.50	<0.50	<0.50	78.6		<0.0050		<0.00010		0.0396		<0.05
MW09-03	3	11/17/2012	0.000009		0.00187	109	<0.50	<0.50	<0.50	89		0.0054		0.000103		0.0687		<0.05
MW09-03	5	5/10/2012	<0.000020		<0.0030	1.01	<0.50	<0.50	<0.50	0.83		0.0069		<0.00010		<0.0010		<0.05
MW09-03	5	11/17/2012	<0.0000050		0.00125	1.79	<0.50	<0.50	<0.50	1.47		<0.0050		<0.000020		0.00136		<0.05
MW12-05	1	11/11/2012	<0.000020	0.000095	0.0154	224	<0.50	<0.50	<0.50	183	0.183	<0.0050		0.00117	0.00098	0.463	0.429	0.146
MW12-05	3	11/12/2012	0.000005		0.0043	231	2.1	<0.50	1.75	193		0.019		0.000307		0.143		0.077
MW12-05	5	11/12/2012	<0.0000050		0.00459	269	<0.50	<0.50	<0.50	221		0.016		0.000329		0.0936		<0.05
MW12-05	7	11/12/2012	<0.0000050		0.00363	256	3.47	<0.50	2.89	216		0.21		0.000917		0.142		0.054
MW12-06	2	11/16/2012	0.000008		0.00317	380	<0.50	<0.50	<0.50	311		0.0074		0.00298		0.0519		0.115
MW12-06	4	11/16/2012	<0.0000050		0.0037	492	<0.50	<0.50	<0.50	403		0.0059		0.00163		0.0425		0.149
MW12-06	6	11/16/2012	<0.0000050		0.00239	421	<0.50	<0.50	<0.50	345		0.085		0.00009		0.0253		0.083
MW12-07	1	11/3/2012	<0.000020		0.0098	378	<0.50	<0.50	<0.50	310		0.012		0.00073		0.169		0.127
MW12-07	2	11/3/2012	<0.000020		0.006	240	<0.50	<0.50	<0.50	197		<0.0050		0.00024		0.0546		0.105

Well ID	Zone	Date	Parameters (mg/L)															
			Be-D	Be-T	Bi-D	Bi-T	B-T	Ca-D	Ca-T	Cd-D	Cd-T	Chloride	Co-D	Cond-L	Co-T	Cr-D	Cr-T	Cu-D
MW09-01	2	11/30/2009	<0.00004	<0.00004	<0.001	<0.001	0.046	89.7	85.9	0.00005	0.00004	7.22	0.00102	729	0.00109	<0.0004	0.0011	0.012
MW09-01	3	11/30/2009	<0.00004	<0.00004	<0.001	<0.001	0.068	75.4	73.2	0.00008	0.00008	7.28	0.00076	725	0.00156	<0.0004	0.0052	0.02
MW09-01	3	3/30/2010	<0.00004	0.00005	<0.001	<0.001	0.095	93.7	98.7	0.00015	0.00014	18.5	0.00045	941	0.00147	<0.0004	0.0072	0.021
MW09-01	4	11/30/2009	<0.00004	0.00004	<0.001	<0.001	0.048	78.2	70.9	0.00007	0.00008	7.27	0.00078	728	0.00145	<0.0004	0.0037	0.018
MW09-02	1	12/2/2009	<0.00004	0.00004	<0.001	<0.001	6.18	98.2	96	0.00009	0.00017	5.52	0.00065	1090	0.00144	0.0036	0.006	0.004
MW09-02	3	12/2/2009	<0.00004	<0.00004	<0.001	<0.001	6.25	99.2	95.1	0.00006	0.00016	5.73	0.00062	1090	0.00121	0.0038	0.0054	0.003
MW09-03	1	12/1/2009	<0.00004	0.00066	<0.001	<0.005	0.514	74.1	85.5	0.0002	0.00012	17.9	0.00045	976	0.0175	<0.0004	0.003	0.019
MW09-03	1	3/29/2010	<0.00004	<0.00004	<0.001	<0.001	0.29	41.2	42.5	0.00012	0.00011	0.4	0.00014	315	0.00019	0.001	0.0022	0.004
MW09-03	1	5/10/2012	<0.00010		<0.0010			42		0.000085		<0.50	<0.00050	302		<0.0010		0.00281
MW09-03	1	11/17/2012	<0.000010		<0.0000050			46.9		0.000683			0.000205	310		0.00014		0.00182
MW09-03	2	12/1/2009	<0.00004	0.00008	<0.001	<0.001	0.25	73.7	74	0.00008	0.00013	16	0.00057	932	0.00147	<0.0004	0.002	0.022
MW09-03	2	3/29/2010	<0.00004	<0.00004	<0.001	<0.001	1.92	56.3	59.3	0.00072	0.00004	3.82	0.0002	502	0.00022	0.0013	0.0014	0.006
MW09-03	2	5/10/2012	<0.00010		<0.0010			154		0.000028		4.3	0.00244	965		<0.0010		0.00107
MW09-03	2	11/17/2012	<0.000050		<0.000025			161		<0.000025			0.00123	979		0.00058		0.00073
MW09-03	3	12/1/2009	<0.00004	<0.00004	<0.001	<0.001	0.064	19.9	20.4	0.00007	0.00008	0.93	0.00024	158	0.00027	<0.0004	0.0013	0.005
MW09-03	3	3/29/2010	<0.00004	<0.00004	<0.001	<0.001	0.034	23.4	24.9	0.00002	0.00001	0.61	0.00009	158	0.00007	<0.0004	<0.0004	0.005
MW09-03	3	5/10/2012	<0.00010		<0.0010			28.1		0.000069		0.54	<0.00050	181		<0.0010		0.0032
MW09-03	3	11/17/2012	<0.000010		<0.0000050			31.9		0.000023			0.000149	200		0.00013		0.00174
MW09-03	5	5/10/2012	<0.00010		<0.0010			<0.050		<0.000010		<0.50	<0.00050	1.9		<0.0010		0.00022
MW09-03	5	11/17/2012	<0.000010		<0.0000050			<0.050		<0.0000050			<0.0000050	2.2		<0.00010		0.000107
MW12-05	1	11/11/2012	<0.00010	<0.00010	<0.0010	<0.0010	0.119	117	118	0.00014	0.000182		0.00379	1030	0.00353	<0.0010	<0.0010	0.00737
MW12-05	3	11/12/2012	<0.000010		<0.0000050			120		0.000214			0.00551	1240		<0.00010		0.0022
MW12-05	5	11/12/2012	<0.000010		<0.0000050			47.2		0.000016			0.000522	515		<0.00010		0.00154
MW12-05	7	11/12/2012	<0.000010		<0.0000050			49.4		<0.0000050			0.000249	486		<0.00010		0.000477
MW12-06	2	11/16/2012	0.00002		<0.0000050			111		0.000016			0.000309	957		<0.00010		0.000231
MW12-06	4	11/16/2012	0.000019		<0.0000050			97.2		0.000012			0.00021	1000		<0.00010		0.000106
MW12-06	6	11/16/2012	<0.000010		<0.0000050			81.2		0.000012			0.000218	905		<0.00010		0.000261
MW12-07	1	11/3/2012	<0.00010		<0.0010			176		0.000633			<0.00050	1250		<0.0010		0.0767
MW12-07	2	11/3/2012	<0.00010		<0.0010			140		0.000269			<0.00050	1070		<0.0010		0.0217

Well ID	Zone	Date	Parameters (mg/L)																
			Cu-T	Fe-D	Fe-T	Fluoride	Hard-D	Hard-T	Hg-D	Hg-T	K-D	K-T	Li-D	Li-T	Mg-D	Mg-T	Mn-D	Mn-T	Mo-D
MW09-01	2	11/30/2009	0.015	0.05	0.324		318		0.00003	0.00005	3.2	3.3	0.001	0.001	22.9	22	0.0802	0.0935	0.0341
MW09-01	3	11/30/2009	0.04	0.04	2.68		262		<0.00001	<0.00001	6.6	7.2	0.003	0.005	18	18	0.228	0.309	0.0892
MW09-01	3	3/30/2010	0.029	0.18	3.37		336		<0.00001	0.00001	7	7.2	0.003	0.003	24.7	26.8	0.168	0.225	0.148
MW09-01	4	11/30/2009	0.035	0.04	1.65		274		<0.00001	0.02	5.8	5.9	0.003	0.004	19.1	17.8	0.189	0.248	0.0733
MW09-02	1	12/2/2009	0.013	0.11	1.76		503		<0.00001	<0.00001	8.2	8.6	0.011	0.013	62.6	62.2	0.27	0.34	0.0442
MW09-02	3	12/2/2009	0.01	0.09	1.28		508		<0.00001	<0.00001	8.4	8.3	0.01	0.013	63.1	61.9	0.261	0.332	0.0487
MW09-03	1	12/1/2009	0.056	0.03	44		253		<0.00001	0.00002	27	31	0.012	0.02	16.5	21.8	0.161	6.78	0.0806
MW09-03	1	3/29/2010	0.006	0.04	0.183		144		<0.00001	<0.00001	4.4	4.2	0.003	0.003	9.9	10.4	0.109	0.123	0.0052
MW09-03	1	5/10/2012		<0.0050		0.87	146		<0.000010		2.7		<0.0050		10		0.0852		0.0054
MW09-03	1	11/17/2012		0.0116			159				3.08		0.00284		10.3		0.0961		0.00516
MW09-03	2	12/1/2009	0.047	0.02	4.93		242		<0.00001	0.00002	26	25.2	0.011	0.012	14.2	14.6	0.135	0.287	0.101
MW09-03	2	3/29/2010	0.008	<0.01	0.175		178		<0.0001	<0.00001	6.6	6.8	0.004	0.005	9.2	9.76	0.0616	0.0677	0.045
MW09-03	2	5/10/2012		19.2		0.75	481		<0.000010		4.44		<0.0050		23.4		22.1		0.0172
MW09-03	2	11/17/2012		19.4			499				4.66		<0.0025		23.4		17.8		0.0167
MW09-03	3	12/1/2009	0.01	0.02	0.673		60		0.00001	0.00001	2.6	3	0.001	0.001	2.4	2.54	0.0184	0.0384	0.0267
MW09-03	3	3/29/2010	0.004	<0.01	0.027		69		<0.0001	<0.00001	2.3	2.1	<0.001	<0.001	2.4	2.62	0.0129	0.0132	0.0064
MW09-03	3	5/10/2012		0.0164		0.3	84.1		<0.000010		1.8		<0.0050		3.36		0.234		0.0061
MW09-03	3	11/17/2012		0.0113			95.3				2.18		0.00086		3.8		0.385		0.0113
MW09-03	5	5/10/2012		<0.0050		<0.010	<0.50		<0.000010		<0.050		<0.0050		<0.050		<0.0010		<0.0010
MW09-03	5	11/17/2012		0.0016			<0.50				<0.050		<0.00050		<0.050		0.000227		0.000578
MW12-05	1	11/11/2012	0.00892	0.0085	0.209		407	402	<0.000010	<0.000010	3.57	3.1	0.0063	<0.0050	27.8	25.8	0.11	0.107	0.012
MW12-05	3	11/12/2012		0.0981			516				4.17		0.00476		52.7		0.647		0.0112
MW12-05	5	11/12/2012		0.0152			231				2.55		0.00439		27.4		0.198		0.0153
MW12-05	7	11/12/2012		0.867			214				1.79		0.00247		22.1		0.411		0.00346
MW12-06	2	11/16/2012		0.736			407				3.95		0.00892		31.7		0.0519		0.0164
MW12-06	4	11/16/2012		0.717			467				3.81		0.00654		54.4		0.057		0.0102
MW12-06	6	11/16/2012		0.0833			425				3.57		0.00509		53.9		0.1		0.0066
MW12-07	1	11/3/2012		0.189			592		<0.000010		5.68		0.0103		37.2		0.289		0.0196
MW12-07	2	11/3/2012		0.0069			496		<0.000010		5.92		0.022		35.5		0.0899		0.0334

Well ID	Zone	Date	Parameters (mg/L)																
			Mo-T	Na-D	Na-T	Ni-D	Ni-T	N-NO2	N-NO3	NO2+NO3	N-TKN	Pb-D	Pb-T	P-D	P-PO4-T	P-T	Sb-D	Sb-T	S-D
MW09-01	2	11/30/2009	0.0356	16.8	16.7	0.004	0.004			42.9	6.79	0.0001	0.0001	<0.01	0.04	<0.05	0.0053	0.0003	25.8
MW09-01	3	11/30/2009	0.0944	28	28.1	0.002	0.005			42.1	6	<0.0001	0.0007	<0.01	0.03	0.06	0.0032	0.0012	27.5
MW09-01	3	3/30/2010	0.146	53.3	56.9	0.002	0.006			21.6	8.89	0.0003	0.001	0.03	0.06	0.09	0.0011	0.0005	56.2
MW09-01	4	11/30/2009	0.0758	26.2	23.6	0.002	0.004			42.1	6.21	<0.0001	0.0005	<0.01	0.03	<0.05	0.0008	0.0003	27.8
MW09-02	1	12/2/2009	0.0481	70.4	73.4	0.004	0.006			23.2	1.13	0.0002	0.0008	<0.01	0.06	<0.05	0.0136	0.003	55.4
MW09-02	3	12/2/2009	0.0499	74.2	71.5	0.003	0.005			24.4	1.01	0.0002	0.0006	<0.01	0.06	<0.05	0.003	0.0038	56.7
MW09-03	1	12/1/2009	0.0742	70.5	65.4	0.008	0.01			60.9	11.7	0.0002	0.004	0.02	0.03	0.19	0.002	<0.001	39
MW09-03	1	3/29/2010	0.006	5.7	7.37	0.005	0.007			0.26	0.4	0.0011	0.0003	<0.01	0.06	<0.05	0.0009	0.0002	7.6
MW09-03	1	5/10/2012		5.59		0.0021		0.182	0.109	0.29		<0.00020		0.012	0.0158		<0.00050		8.3
MW09-03	1	11/17/2012		5.52		0.00562		0.118	0.069	0.187		0.000036				0.0042	0.000181		9.4
MW09-03	2	12/1/2009	0.108	63	66.1	0.004	0.005			58.2	12.2	0.0001	0.0008	<0.01	0.03	0.07	0.0021	0.0008	36.7
MW09-03	2	3/29/2010	0.0468	24.9	25.7	0.002	0.002			16.1	1.22	0.0003	0.0003	<0.01	0.07	<0.05	0.0018	<0.0002	16.3
MW09-03	2	5/10/2012		15.8		<0.0010		0.171	0.1	0.271		<0.00020		<0.01	0.0093		<0.00050		<3.0
MW09-03	2	11/17/2012		15.5		0.00123		0.0924	0.035	0.127		0.000152				<0.01	0.00024		<15
MW09-03	3	12/1/2009	0.0288	5.5	5.72	0.002	0.002			1.87	0.34	0.0001	0.0002	<0.01	0.04	<0.05	0.0021	0.0025	3.4
MW09-03	3	3/29/2010	0.0065	2.6	3.08	<0.001	<0.001			0.47	<0.06	0.0007	0.0002	<0.01	0.06	<0.05	0.0009	<0.0002	3.4
MW09-03	3	5/10/2012		3.13		<0.0010		0.0145	0.302	0.316		<0.00020		<0.01	<0.0050		<0.00050		4.1
MW09-03	3	11/17/2012		3.33		0.000266		0.0058	0.248	0.254		0.000016				0.004	0.000077		3.7
MW09-03	5	5/10/2012		0.222		<0.0010		<0.0050	<0.020	<0.020		<0.00020		<0.01	<0.0050		<0.00050		<3.0
MW09-03	5	11/17/2012		<0.050		<0.000020		<0.0050	<0.020	<0.020		0.000014				<0.0020	0.000033		<3.0
MW12-05	1	11/11/2012	0.0114	64.2	56.8	0.0043	0.0045	0.0517	0.368	0.42		<0.00020	0.00056	<0.01		0.018	0.00056	<0.00050	122
MW12-05	3	11/12/2012		67.6		0.00328		0.109	0.03	0.139		0.000124				0.0058	0.000197		166
MW12-05	5	11/12/2012		18.5		0.000905		0.195	0.817	1.01		0.000055				0.0035	0.000086		17.3
MW12-05	7	11/12/2012		17.9		0.00097		0.0298	<0.020	0.041		0.000039				0.0125	0.000134		14.4
MW12-06	2	11/16/2012		42.9		0.000949		0.263	0.081	0.343		0.000029				0.0265	0.000231		72.7
MW12-06	4	11/16/2012		33.7		0.000513		0.229	0.08	0.309		0.000031				0.0229	0.000116		58.3
MW12-06	6	11/16/2012		32.9		0.000514		0.0651	0.45	0.515		0.000061				0.0047	0.000096		58.3
MW12-07	1	11/3/2012		34.1		0.004		0.141	53.5	53.7		0.00058		<0.01			<0.00050		67.5
MW12-07	2	11/3/2012		38.9		0.0017		0.148	21.3	21.5		0.00056		<0.01			<0.00050		104

Well ID	Zone	Date	Parameters (mg/L)																
			Se-D	Se-T	Si-D	Si-T	Sn-D	Sn-T	SO4-D	Sr-D	Sr-T	S-T	Te-D	Te-T	Th-D	Th-T	Ti-D	Ti-T	TI-D
MW09-01	2	11/30/2009	0.0028	0.0029	4.37	4.54	<0.0001	<0.0001	77.4	1.04	1.27	27.6	<0.0001	<0.0001	<0.0004	<0.0004	<0.01		<0.00001
MW09-01	3	11/30/2009	0.0028	0.0032	2.87	7.01	0.0001	<0.0001	82.5	1.51	1.84	28.5	<0.0001	<0.0001	<0.0004	<0.0004	<0.01		<0.00001
MW09-01	3	3/30/2010	0.0018	0.0019	3.39	7	0.0003	<0.0001	169	1.41	1.43	58.3	<0.0001	<0.0001	<0.0004	<0.0004	<0.01		<0.00001
MW09-01	4	11/30/2009	0.003	0.0031	3.36	5.12	<0.0001	<0.0001	83.3	1.39	1.64	28.2	<0.0001	<0.0001	<0.0004	<0.0004	<0.01		<0.00001
MW09-02	1	12/2/2009	0.0067	0.0072	6.88	9.32	<0.0001	<0.0001	166	2.11	2.55	60.5	<0.0001	<0.0001	<0.0004	<0.0004	<0.01		<0.00001
MW09-02	3	12/2/2009	0.0068	0.0073	6.94	8.46	<0.0001	<0.0001	170	2.14	2.53	59.9	<0.0001	<0.0001	<0.0004	<0.0004	<0.01		<0.00001
MW09-03	1	12/1/2009	0.008	0.011	2.49	38.1	0.0002	<0.0005	117	2.21	2.41	41	<0.0001	<0.0005	<0.0004	<0.002	<0.01		<0.00001
MW09-03	1	3/29/2010	<0.0006	<0.0006	4	4.6	<0.0001	<0.0001	23	0.863	0.886	7.3	<0.0001	<0.0001	<0.0004	<0.0004	<0.01		<0.00001
MW09-03	1	5/10/2012	<0.00010		4.56		<0.0050		21.4	0.798							<0.0050		<0.000050
MW09-03	1	11/17/2012	0.000052		5.55		<0.00020		22.2	0.809							<0.00050		0.000003
MW09-03	2	12/1/2009	0.0067	0.0078	2.54	9.99	0.0002	0.0003	110	1.86	2.17	39.1	<0.0001	<0.0001	<0.0004	<0.0004	<0.01		<0.00001
MW09-03	2	3/29/2010	0.0028	0.0029	3.7	4.11	<0.0001	<0.0001	48.9	0.739	0.785	15.8	<0.0001	<0.0001	<0.0004	<0.0004	<0.01		<0.00001
MW09-03	2	5/10/2012	0.0002		9.03		<0.0050		<0.50	1.58							<0.0050		<0.000050
MW09-03	2	11/17/2012	<0.00020		10.9		<0.0010		<0.50	1.57							<0.0025		<0.000010
MW09-03	3	12/1/2009	<0.0006	0.0007	4.2	5.49	<0.0001	<0.0001	10	0.168	0.189	3.8	<0.0001	<0.0001	<0.0004	<0.0004	<0.01		<0.00001
MW09-03	3	3/29/2010	<0.0006	<0.0006	3.85	4.4	<0.0001	<0.0001	10	0.125	0.126	3.4	<0.0001	<0.0001	<0.0004	<0.0004	<0.01		<0.00001
MW09-03	3	5/10/2012	0.00031		4.31		<0.0050		11.2	0.158							<0.0050		<0.000050
MW09-03	3	11/17/2012	0.000414		4.96		<0.00020		9.79	0.2							<0.00050		0.000003
MW09-03	5	5/10/2012	<0.00010		<0.1		<0.0050		<0.50	<0.0010							<0.0050		<0.000050
MW09-03	5	11/17/2012	<0.000040		<0.1		<0.00020		<0.50	0.00387							<0.00050		<0.000020
MW12-05	1	11/11/2012	0.00047	0.00043	5.59	5.93	<0.0050	<0.0050	350	3.05	2.95	108					<0.0050	0.006	<0.000050
MW12-05	3	11/12/2012	0.000364		5.03		<0.00020		456	3.89							<0.00050		0.000004
MW12-05	5	11/12/2012	0.000164		5.8		<0.00020		46.3	0.816							<0.00050		0.000002
MW12-05	7	11/12/2012	0.000108		5.27		<0.00020		40.6	0.534							<0.00050		<0.000020
MW12-06	2	11/16/2012	0.00014		7.09		<0.00020		208	8.59							<0.00050		<0.000020
MW12-06	4	11/16/2012	0.000083		7.41		<0.00020		178	3.21							<0.00050		<0.000020
MW12-06	6	11/16/2012	0.000511		6.29		<0.00020		171	1.76							<0.00050		<0.000020
MW12-07	1	11/3/2012	0.0347		6.79		<0.0050		185	5.37							<0.0050		<0.000050
MW12-07	2	11/3/2012	0.0148		6.61		<0.0050		283	3.68							<0.0050		<0.000050



Well ID	Zone	Date	Parameters (mg/L)											pH-L	Turb (NTU)
			TI-T	U-D	U-T	V-D	V-T	Zn-D	Zn-T	Zr-D	Zr-T	TDS	TSS		
MW09-01	2	11/30/2009	<0.00001	0.0029	0.0032	0.0002	0.0006	0.009	0.007	<0.0001	0.0002	528	7	8.03	1.1
MW09-01	3	11/30/2009	0.00002	<0.0004	0.0004	0.0001	0.0046	0.006	0.029	0.0001	0.0006	364	92	8.02	32
MW09-01	3	3/30/2010	0.00002	<0.0004	<0.0004	0.0003	0.0049	0.016	0.025	0.0002	0.0005	630	70	8.04	64
MW09-01	4	11/30/2009	0.00001	0.0008	0.0008	0.0001	0.0033	0.004	0.019	<0.0001	0.0004	442	66	8.06	26
MW09-02	1	12/2/2009	0.00001	0.0038	0.0045	0.0011	0.0036	0.01	0.024	0.0001	0.0004	814	30	7.95	13
MW09-02	3	12/2/2009	<0.00001	0.0039	0.0044	0.0012	0.0029	0.007	0.018	0.0001	0.0004	812	31	7.95	16
MW09-03	1	12/1/2009	0.00016	0.001	0.002	0.0002	0.039	0.022	0.13	0.0001	0.0006	652	399	7.94	95
MW09-03	1	3/29/2010	<0.00001	0.0015	0.0015	0.0001	0.0003	0.014	0.016	<0.0001	0.0001	196	<4	8	2.5
MW09-03	1	5/10/2012		0.00158		<0.0050		0.0171		<0.00050		162		7.99	
MW09-03	1	11/17/2012		0.00155		<0.00020		0.0108		<0.00010		160			
MW09-03	2	12/1/2009	0.00002	0.0008	0.0009	0.0001	0.0065	0.01	0.036	<0.0001	0.0004	626	146	7.91	49
MW09-03	2	3/29/2010	<0.00001	0.0014	0.0014	0.0004	0.0005	0.005	0.01	<0.0001	<0.0001	324	<7	8.05	3
MW09-03	2	5/10/2012		0.00016		<0.0050		0.0053		<0.00050		716		7.59	
MW09-03	2	11/17/2012		0.000208		<0.0010		0.00795		<0.00050		648			
MW09-03	3	12/1/2009	<0.00001	<0.0004	<0.0004	0.0002	0.0012	0.012	0.033	<0.0001	0.0001	110	21	7.8	6.9
MW09-03	3	3/29/2010	<0.00001	<0.0004	<0.0004	0.0002	0.0003	0.005	0.01	<0.0001	<0.0001	114	<4	7.84	0.3
MW09-03	3	5/10/2012		0.00069		<0.0050		0.0078		<0.00050		106		7.92	
MW09-03	3	11/17/2012		0.000842		0.00028		0.00136		<0.00010		114			
MW09-03	5	5/10/2012		<0.00010		<0.0050		<0.0050		<0.00050		<10		5.93	
MW09-03	5	11/17/2012		0.000025		0.00038		0.00046		<0.00010		<10			
MW12-05	1	11/11/2012	<0.000050	0.00404	0.00386	<0.0050	<0.0050	0.0402	0.0388	<0.00050	<0.00050	706			
MW12-05	3	11/12/2012		0.0041		<0.00020		0.0312		<0.00010		880			
MW12-05	5	11/12/2012		0.00273		0.0005		0.00655		<0.00010		288			
MW12-05	7	11/12/2012		0.00227		0.00033		0.00538		<0.00010		260			
MW12-06	2	11/16/2012		0.00575		<0.00020		0.0111		<0.00010		636			
MW12-06	4	11/16/2012		0.00681		<0.00020		0.00807		<0.00010		618			
MW12-06	6	11/16/2012		0.00482		0.00026		0.00312		<0.00010		538			
MW12-07	1	11/3/2012		0.00609		<0.0050		0.0637		<0.00050		924			
MW12-07	2	11/3/2012		0.00575		<0.0050		0.0385		<0.00050		782			