Appendix 6.6-A

Baseline Groundwater Hydrology Assessment

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

KGHM AJAX MINING INC.

AJAX PROJECT ENVIRONMENTAL ASSESSMENT

BASELINE GROUNDWATER HYDROLOGY ASSESSMENT

FINAL

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August 26, 2015
Project No.: 1125007-03

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Dear Ms. Ore,

Re: Ajax Project EA – Baseline Groundwater Hydrology Assessment

Please find attached a copy of the above referenced FINAL report. BGC appreciates the opportunity to be involved in this world class mining project. We look forward to providing continued support to KGHM Ajax Mining Inc.

Should you have any questions or comments, please do not hesitate to contact the undersigned.

Yours sincerely,

BGC ENGINEERING INC.
per:

Cassandra Koenig, M.Sc. P.Geo.
Hydrogeologist

EXECUTIVE SUMMARY

BGC Engineering Inc. (BGC) was retained by KGHM Ajax Mining Inc. (KAM) to complete a baseline groundwater hydrology, or hydrogeology, study for the Ajax Project (the Project) near Kamloops, British Columbia. KAM proposes to further develop the Ajax copper-gold mine at the historic Afton Mining Camp that was formerly mined in the 1980s and 1990s.

The objective of this report is to define the baseline hydrogeologic conditions in the regional and local study areas (RSA and LSA) for the Project. The RSA and LSA represent anticipated extents of interaction between the Project and surrounding groundwater resources. This report will support the provincial Application for an Environmental Assessment (EA) Certificate and the federal Environmental Impact Statement (EIS) for the Project, to be submitted in 2015.

This assessment was conducted by compiling and reviewing the available geological, hydrogeological, geotechnical and groundwater quality data obtained for the Ajax Project, the New Afton Mine and Aberdeen area, as well as information from publicly available maps, air photos and reports within the RSA.

Hydrogeological studies have been completed at, or near the Ajax Project since 1988. The most pertinent to this assessment include studies completed by BGC (geotechnical drilling investigations, open pit slope designs and dewatering, groundwater monitoring network design, installation and hydraulic testing, surface water balance modeling and groundwater level), Knight Piesold (geotechnical drilling investigations, groundwater quality and level monitoring and site hydrometeorology), Klohn Crippen Berger (hydrogeological site investigations) and Klohn Leonoff (historical hydrogeological assessments). Additional hydrogeological investigations available to inform this assessment included work completed near the New Afton mine to the northwest, and in the Aberdeen neighborhood to the northeast of the Ajax Project. The online Water Resources of BC atlas, which is maintained by the BC Ministry of Environment (BC MOE), also provided significant data (i.e., registered water wells and mapped groundwater resources) for this assessment.

There are thirteen mapped aquifers and 495 registered water wells within the RSA that are reportedly used for domestic or multiple purposes. Five mapped aquifers fall within the LSA. These include the Sugarloaf Hill (No. 0276) and Knutsford (No. 0275) bedrock aquifers, part of the Brigade Lake (No. 0274) bedrock aquifer and the Davidson Creek (No. 0277) and Peterson Creek (No. 0278) sand and gravel aquifers. The Peterson Creek and Davidson Creek Aquifers are mapped along Lower Peterson Creek and Davidson Brook, to the southeast and east of the proposed Ajax pit.

The formations encountered within the RSA were divided into hydrostratigraphic units based on geologic provenance interpreted from available mapping and published depositional models for the area, as well as textural descriptions and hydraulic test data collected during hydrogeological and geotechnical site investigations for the Project.

Surficial hydrostratigraphic units are comprised primarily of low permeability glacial till in upland areas, with moderate to high hydraulic conductivity glaciofluvial/glaciolacustrine sand and gravel complexes within topographic depressions. The glaciofluvial/glaciolacustrine sand and gravel complexes comprise the major sand and gravel aquifers within the region, including the Peterson Creek and Davidson Creek Aquifers near the Ajax Project. More recent, post glacially deposited fluvial, lacustrine and eolian sediments as well as anthropogenic materials (e.g., reclaimed mine rock piles tailings areas and haul roads) also comprise surficial materials within the RSA.

The underlying bedrock hydrostratigraphy, from most to least hydraulically conductive consists of the Kamloops Group, Iron Mask Hybrid, Picrite, Sugarloaf Diorite and Nicola Group units. The Sugarloaf Hill bedrock aquifer is included with the Iron Mask Hybrid and the Knutsford bedrock aquifer is included in the Kamloops Group hydrostratigraphic units, respectively. The sub-horizontal deposition of Kamloops Group rocks may impart a layered characteristic giving it a macroscale anisotropy, potentially magnified by the presence of “swelling clays” mapped in Aberdeen.

Several geologic fault zones within the RSA have been identified as hydraulically significant. The Hugh Allen/Versatile faults to the north of the Ajax Project have been interpreted by others to act as barriers to northward groundwater flow from Aberdeen towards Kamloops Lake/Thompson River due to lower hydraulic conductivities than adjacent bedrock. The Edith Lake Fault Zone (ELFZ), a feature interpreted by the BC Geological Survey to the south of the Ajax Project, could potentially act as a local groundwater flow conduit along strike in areas of locally enhanced hydraulic conductivity.

The Ajax RSA has a semi-arid steppe climate with high evaporation rates and limited precipitation. Groundwater recharge is from infiltration of precipitation and snowmelt primarily in uplands, irrigation in developed areas, with lesser amounts from surface water infiltration at ponds, lakes, creeks and gullies. Groundwater generally discharges to streams, rivers, seeps and breaks in slope. Groundwater also discharges as evapotranspiration, particularly where the water table is near the ground surface. Flowing artesian conditions exist at the toes of slopes and in wells installed below or near upland areas. Groundwater abstraction to maintain slope stability in Aberdeen is also a groundwater sink in the RSA.

Groundwater levels near the Project vary from less than 0.1 m to approximately 4 m, annually. Groundwater elevations typically decline from September to March and are highest from June to September. This seasonal variation is consistent with climatic trends. Some groundwater monitoring locations near the Ajax Project show rapid water level recoveries following precipitation events. These locations are interpreted to receive localized recharge due to higher permeability near surface sediments or fractured bedrock. Monitoring locations where groundwater levels reach seasonal maxima in September or October may receive recharge from distant sources in addition to delayed surface infiltration caused by near surface lower permeability sediments.

Topography has a pervasive influence on groundwater flow throughout the RSA. Measured groundwater elevations suggest that the water table is a subdued replica of topography, with depths to groundwater greater in uplands relative to lowlands. Groundwater generally flows from south to north from Chuwels Mountain to Kamloops Lake / Thompson River, but with local variations due to topography and geological conditions. The ridge system trending northwest-southeast north of the Mine Site is interpreted to coincide with a groundwater divide between northward (i.e., towards Aberdeen) and southward (i.e., towards the Ajax Project) flowing groundwater.

Near the Ajax Project, groundwater converges towards the existing Ajax West Pits. Groundwater also converges towards the topographic saddle that occurs near the confluence of Peterson Creek with Jacko Lake, and then flows either northwestward from Jacko Lake beyond the Ajax Project, or eastward following the Peterson Creek drainage.

Three scales of groundwater flow systems are interpreted within both the RSA and the LSA:

1. Shallow (localized) groundwater flow systems.
2. Intermediate groundwater flow system.
3. Regional groundwater flow system.

Shallow flow systems are interpreted to be controlled by local topography and near surface geological conditions, with flow paths on the order of a few tens to several hundreds of metres. These systems are interpreted to exist throughout the RSA primarily within surficial deposits and shallow bedrock at depths less than 30 m on average, but up to 80 m in areas with thick surficial deposits, such as the Peterson Creek Aquifer. Shallow systems are conceptualized to be recharged primarily by infiltration of precipitation and snowmelt, and to discharge to streams, creeks and seeps, and as evapotranspiration. Shallow systems may also be recharged by, and discharge to the underlying intermediate scale groundwater flow system.

The intermediate groundwater flow system is interpreted to exist within the upper 200 m of bedrock throughout the RSA within more permeable fractured and faulted zones. Flow paths within the intermediate system may be on the order of hundreds of metres to several kilometres. The intermediate system is conceptualized to be recharged by the shallow groundwater flow system and to discharge to the deeper regional flow system. The intermediate system may also discharge to the shallow system where upward hydraulic gradients develop, such as areas near the Peterson Creek Aquifer, Jacko Lake, Humphrey Creek, and potentially the ELFZ.

The regional groundwater flow system is interpreted to exist at depths greater than 200 m within bedrock of low hydraulic conductivity. Flow paths of the regional system may be on the order of kilometers to tens of kilometres. The regional system is conceptualized to be recharged by vertical leakage from the intermediate system and to discharge primarily to the Thompson River/Kamloops Lake. The regional system may also discharge to the intermediate system where intercepted by deep-seated fractures or fault zones.

Groundwater quality for the Ajax Project was assessed by Knight Piesold and was generally characterized as alkaline, hard to very hard and high in total dissolved solids. Sodium-sulphate, magnesium-sulphate and sulphate were identified as major water types. Weakly dominant cations include sodium, magnesium and calcium and elevated trace metals and metalloids include arsenic, boron, manganese, molybdenum and selenium. The distribution of trace metal and metalloid concentrations were found to be influenced by local geological enrichment in specific minerals and by proximity to the open pit area and did not correlate with major ions. Overall water quality signatures were found to be distinguished by location and proximity to the mineralized zone (i.e the open pit) and to potential groundwater recharge and discharge zones.

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08B – Cross Section B

08C – Cross Section C

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LIST OF ACRONYMS

AIR/EIS Guidelines	Application Information Requirements/Environmental Impact Statement
ALS	ALS Environmental Services
Application/EIS	Application for an Environmental Assessment Certificate/Environmental Impact Statement for a Comprehensive Study
AME	Abacus Mining and Exploration Corporation
AW	Aquatic Water
BC EAO	British Columbia Environmental Assessment Office
BCGS	British Columbia Geological Survey
BC MOE	British Columbia Ministry of Environment
BC WQG	British Columbia Water Quality Guidelines
BGC	BGC Engineering Inc.
CAEAL	Canadian Association for Environmental Analytical Laboratories
CD	Compact disc
CEA Agency	Canadian Environmental Assessment Agency
CSR	Contaminated Sites Regulations
DDH	Diamond Drill Hole
DO	Dissolved Oxygen
DWMS	Aberdeen Dewatering and Monitoring System
EA	Environmental Assessment
EC	Electrical Conductivity
EIS	Environmental Impact Statement
ELFZ	Edith Lake Fault Zone
ELTF	Edith Lake Thrust Fault
ERSi	Earth Resource Surveys Inc.
EMRSF	East Mine Rock Storage Facility
FS	Feasibility Study
GSC	Geological Survey of Canada
IMH	Iron Mask Hybrid
KAM	KGHM Ajax Mining Inc.
KCB	Klohn Crippen Berger Ltd.
Keystone	Keystone Wildlife Research Ltd.
KP	Knight Piesold
LSA	Local Study Area

MAP	Mean Annual Precipitation
MEMA	Mines and Environmental Management Act
uTrNop	Picrite Unit
uTrN	Nicola Volcanics
ORP or Eh	Oxidation-Reduction Potential
PEA	Preliminary Economic Analysis
PET	Potential Evapotranspiration
PFS	Prefeasibility Study
RQD	Rock Quality Designation
RSA	Regional Study Area
SI	Site Investigation
SLD	Sugarloaf Diorite
SMRSF	South Mine Rock Storage Facility
TDS	Total Dissolved Solids
The City	The City of Kamloops
TSF	Tailings Storage Facility
TTP	Tailings Thickening Plant
VC	Valued component
VWP	Vibrating Wire Piezometer
WAD	Weak Acid Dissociable
WRBC	Water Resources of British Columbia
WMRSF	West Mine Rock Storage Facility

1.0 INTRODUCTION

BGC Engineering Inc. (BGC) was retained by KGHM Ajax Mining Inc. (KAM) to complete a baseline groundwater hydrology, or hydrogeology, study for the Ajax Project (the Project) near Kamloops, British Columbia. The objective of this report is to define the baseline hydrogeologic conditions in the regional and local study areas (RSA and LSA) for the Project as laid out in the Application Information Requirements (AIR) and Environmental Impact Statement (EIS) guidelines (AIR/EIS Guidelines) [*EAO*, 2015]. This report will support the provincial Application for an Environmental Assessment (EA) Certificate and the federal EIS for the Project, to be submitted in 2015. The provincial Application and the federal EIS will be referred to as the Application/EIS throughout this document.

1.1. Background and Project Description

KGHM Ajax Mining Inc. proposes to develop the Ajax Project (Project), an open pit copper-gold mine at the historic Afton Mining Camp, south of the City of Kamloops, British Columbia (BC). The Project is located in the South-Central Interior of British Columbia, southeast of the junction of the Trans-Canada Highway No. 1 and the Coquihalla Highway (No. 5), within the Thompson Nicola Regional District.

The Project lies in the traditional territory of the Secwepemc Nation. Within the Secwepemc Nation, the Tk'emlúps te Secwepemc and the Skeetchestn Indian Band are the Aboriginal groups in closest proximity to the Project. In a cooperative effort, the Tk'emlúps te Secwepemc and Skeetchestn Indian Bands have formed the Stk'emlupsemc te Secwepemc Nation (SSN), as a division of the greater Secwepemc Nation. The Ashcroft Indian Band and Lower Nicola Indian Band, whose members are part of the Nlaka'pamux Nation also assert their Aboriginal rights to the Project area- an area of common interest with the SSN.

The Ajax property includes three historic pits: the Ajax West E Pit, the Ajax West W Pit and the Ajax East Pit. The pits were formerly mined in the 1980s and 1990s. As many as 25 rock types have been recognized in the Project area, some of which are "hybrid" units resulting from the intermixing of multiple rock types.

Key Project facilities include the Tailings Storage Facility (TSF), which is planned as a conventional tailings storage facility; water management ponds; Peterson Creek diversion, and the Tailings Embankments, which will be constructed using mine rock; and four mine rock storage facilities (MRSFs). The four MRSFs include:

- The South Mine Rock Storage Facility (SMRSF)
- East Mine Rock Storage Facility (EMRSF)
- West Mine Rock Storage Facility (WMRSF)
- The In-Pit Mine Rock Storage Facility (IPMRSF).

Several facilities that will be part of the operation phase but not remain after project closure include the:

- Plant facilities and administration buildings
- Reclamation stockpiles
- Explosives facility
- Truck shop and fuel storage
- Power lines
- Access roads.

The mine plan for the Project predicts an operation based on a mill throughput of 65,000 tonnes of ore per day from the Ajax Pit with up to a 23 year mine life. The construction phase of the Project will be approximately two and a half years, and following the 23 year operation the decommissioning and closure phase is expected to take up to 5 years. Over the mine life the Project will produce approximately 140 million pounds of copper and 130,000 ounces of gold annually with the concentrate shipped by truck to the Port of Vancouver.The General Arrangement (GA) of the Project is shown on Drawing 01.

1.2. Aberdeen Hills Area

The Aberdeen Hills area (Aberdeen) is located approximately 3 km to the north east of the Mine Site (Drawing 01) within the City of Kamloops (the City). A number of hydrogeological and geotechnical studies have been completed in Aberdeen on behalf of the City to address potential impacts to slope stability, which could result from upslope development from the subdivision. The current Project GA does not require upslope development from Aberdeen. As shown on Drawing 01, development of the majority of Mine Site facilities (i.e., the TSF, WMRSF and SMRSF) is planned to be completed on the southern side of Peterson Creek, and all Mine Site facilities (i.e., the open pit and EMRSF) are proposed to be developed on the southern side of a topographic divide separating Aberdeen from the Mine Site.

The AIR/EIS Guidelines indicate that the potential for increases in piezometric levels in Aberdeen will be identified and assessed in Application/EIS for the Project. Sections 1.2.1 and 1.2.2 summarize relevant information to this assessment from a series of hydrogeological investigations and groundwater modeling studies completed in the Aberdeen Hills area. This information was sourced from a digital compilation of hydrogeological and geotechnical data and reports provided by the City for the purposes of hydrogeological assessments to support the Project [City of Kamloops, 2012]. Data and results from hydrogeological investigations presented within this digital compilation have been incorporated into the conceptual hydrogeological model developed in this assessment, where appropriate, and are discussed throughout this report.

1.2.1. History of Instability and Current Control Measures

Aberdeen has been the focus of geotechnical studies to support subdivision development since the 1970s. In 1995, several homes were affected by ground movement near the intersection of Van Horne Dr. and Howe Rd, an event now referred to as the "Van Horne Slide". As part of an emergency mitigation plan, a series of pumping wells were installed to dewater the affected area, effectively stopping the Van Horne Slide in 1996 [*City of Kamloops*, 2008]. Some of these wells currently remain in operation (DW-Series wells [*Golder*, 2008c]).

A series of geotechnical investigations to assess large scale stability issues in the Aberdeen area were prompted by the Van Horne Slide as well as plans for new subdivision development in subsequent years. A list of these reports is included in the references section of this document [*Klohn-Crippen*, 1998; 2001; 2003; 2004]. These investigations led to the delineation of two potentially sensitive geomorphic features, and indicated a minimum factor of safety for slope stability that must be maintained. The sensitive geomorphic features consist of a prehistoric landslide feature ("Area A") and a surrounding stable, but sensitive area ("Area B"). These features comprise the majority of the Aberdeen area (Drawing 01).

Planes of movement are inferred to develop along an alteration zone of montmorillonite (swelling) clays at the interface of the underlying Quaternary deposits and Tertiary Kamloops Group sedimentary deposits within Area A [*Golder*, 2008c; *Klohn-Crippen*, 1998]. The swelling clays are particularly susceptible to instability when subjected to increased piezometric pressure or unfavourable soil relocation. Elevated piezometric pressures in critical areas may develop from increased or excessive groundwater recharge or a failure of the dewatering systems currently in place. Soil relocation through movement, removal and/or placement of fills and natural soils may reduce factors of safety to unacceptable levels.

To date, the City has implemented a number of risk evaluation and control measures to mitigate ground instability in the Aberdeen area. These include:

- Commissioning of detailed geological [Read, 1998], hydrogeological [*Golder*, 2008a; c; d] and slope stability [*Golder*, 2007; 2011c; *Klohn-Crippen*, 1998; 2001; 2003; 2004] assessments of the area.
- Installing a network of inclinometer casings for ongoing measurement of ground movement in Area A and 2020 Van Horne.
- Installing, operating and maintaining 30 dewatering wells to reduce piezometric pressures in critical areas.
- Frequent monitoring of the Aberdeen Dewatering and Monitoring System (DWMS), which consists of the aforementioned dewatering wells and a network of more than 100 piezometers installed in the area since 1995.
- Implementing irrigation and land development controls as they pertain to ground stability. This includes construction of subdrains and surface drainage measures with new lots, setting irrigation limits for new lots and development of technical criteria for major rezoning applications and specified areas.

- Implementing the use of eFacility, a web-based database and monitoring program that allows for setting of alert levels for groundwater pressures and dewatering well function. Weekly field data collected by the City are integrated into the database, so that when alert levels are triggered, the City and Golder Associates (Golder) are notified.
- Creating the Aberdeen Review Group (ARG) to assess risks of ongoing conditions on a monthly basis. The ARG consists of a panel of Golder and City personnel actively involved in the monitoring and maintenance of the DWMS.
- Commissioning scheduled data recording, groundwater pressure reviews, observational tours and stability assessments.
- Developing a risk management plan [*Golder*, 2008b], which formalizes many of the risk management measures stated above.

1.2.2. Golder Hydrogeological Assessments and Groundwater Model

Golder has carried out and reported on hydrogeological evaluations in the Aberdeen area on behalf of the City since 1998. The most recent of these reports made available to BGC for this assessment were submitted to the City in 2008. Results of these evaluations have suggested that increases in groundwater pressures (and therefore the potential for slope instability in Aberdeen), have been caused by development-related increases in infiltration of surface water [*Golder*, 2008c]. Part of the work completed by Golder included the development of a numerical groundwater flow model [*Golder*, 2008c]. This model is currently maintained and used as a predictive tool to assess potential impacts of any future development as well as mitigation measures for the Aberdeen area.

Golder has indicated that future development upslope of the existing subdivision could result in the development of increased pore pressures and instability in sensitive areas [*Golder*, 2008a; d]. The hazard of increased piezometric pressures identified in each of these studies is primarily the result of having groundwater recharge in excess of the ability of the City's current dewatering system to maintain groundwater pressures at acceptable levels indicated in Klohn-Crippen [1998].

2.0 SCOPE OF WORK

This report presents the conceptual understanding of the baseline groundwater hydrology in the Ajax Mine Site and surrounding region. The report is based on a review and compilation of existing site investigation (SI) data and results from geological, hydrogeological, geotechnical and groundwater quality field programs conducted as part of various engineering and permitting phases for the Ajax Project over many years. Publicly available hydrogeologic data for the region were also compiled and evaluated in this assessment.

This assessment also provides the conceptual basis for the development of the numerical groundwater flow model being completed to support the Application/EIS [*BGC*, 2015d]. Predicted effects of the Project on groundwater hydrology (specifically groundwater quantity, flow direction, groundwater levels in Aberdeen and interaction with surface water bodies (lakes, streams, and wetlands)) during construction, operations and closure (decommissioning and reclamation) and post-closure are addressed through numerical modelling studies presented under separate cover [*BGC*, 2015a; d; e].

The scope of this assessment was completed in accordance with the Application/EIS Requirements and Guidelines for the Ajax Project as outlined in [*EAO*, 2015]. A summary of these requirements and where they may be found within this report is provided in Table 1. This report has also considered information requirements outlined in Section 4.1 of the document Framework for a Hydrogeologic Study in support of an application for an Environmental Assessment Certificate under the Environmental Assessment Act and Regulations for groundwater extraction projects [*BC MOE*, 2013b].

This document includes results from hydrogeological and geotechnical SIs completed before May 2015 and groundwater level data collected before October 2014. This document supersedes the baseline assessment completed by BGC in 2013 for the Project [*BGC*, 2013c].

2.1. Temporal Boundaries

Hydrogeological data specific to the development proposed by KAM and used in this baseline assessment were collected between 2007 and 2014. This includes data collected by BGC and others through SIs associated with a Preliminary Economic Assessment (PEA), a Feasibility Study (FS) and in support of the current EA. A hydrogeology study completed by Klohn Leonoff in 1988 on behalf of Afton Mining Corporation to support a previous phase of development of the Project (i.e., during the 1980s and 1990s) was also considered in this assessment.

Historical data from regional sources including the Aberdeen area collected on behalf of the City of Kamloops (the City), the nearby New Afton site for New Gold Inc. and publicly available data from the online Water Resources of BC (WRBC) atlas [*BC MOE*, 2014] were compiled and used to inform and/or benchmark interpretations of the available data presented in this work. Further discussion on data sources considered in this report is provided in Section 3.

2.2. Spatial Boundaries

The Application/EIS must include criteria used to determine the extent of spatial boundaries for impacts of the Project on groundwater quantity and quality. In accordance with the Application/EIS, the following definitions are used to define the groundwater study areas:

- Local study area (LSA) is defined as the Project footprint and surrounding area within which there is a reasonable potential for immediate impacts to occur to groundwater quantity and quality due to project components or activities.
- Regional Study Area (RSA) is defined based on the Cumulative Effects Assessment Practitioners Guide [CEA Agency, 1999].

> *"the spatial area within which cumulative effects are assessed (i.e., extending a distance from the project footprint in which both direct and indirect effects are anticipated to occur*)."

For the purposes of a hydrogeologic assessment, such cumulative effects may include drawdown of groundwater levels due to open pit dewatering, alteration in the groundwater flow regime, changes (location, magnitude and timing effects) to groundwater recharge and/or discharge, and changes (location, magnitude and timing effects) to groundwater chemistry.

The RSA and LSA boundaries for groundwater have been delineated to coincide with mapped watersheds [iMapBC, 2013], and the limits of the underlying regionally mapped aquifers documented within the WRBC atlas [*BC MOE*, 2014]. The LSA boundaries for the Project were also informed by the results of preliminary numerical groundwater flow and particle tracking simulations [*BGC*, 2014a]. The limits of the RSA and LSA are shown on Drawing 02. Further justification for boundary delineation is provided below.

2.2.1. Regional Study Area Limits

The south western and western limits of the RSA for groundwater have been delineated to coincide with limits of the Cherry Creek, Peterson Creek and Anderson Creek Watersheds [iMapBC, 2013], and the limits of the underlying mapped aquifers 0727 and 0728 documented within the WRBC atlas [*BC MOE*, 2014]. In the north, the RSA is bound by Kamloops Lake/Thompson River, and the limits of mapped aquifers 0283, 0284 and 0286. The RSA is bound by Campbell Creek in the east, and the southeast limit of the RSA was set to coincide with mapped aquifer 0275. A portion of the City of Kamloops to the south of Kamloops Lake/Thompson River (which includes the Aberdeen neighbourhood) falls within the RSA. The limits of the RSA are shown on Drawing 02. The characteristics of these aquifers are summarized in Section 6.0.

2.2.2. Local Study Area Limits

The preliminary LSA boundaries were set to coincide with the expected area of potential Project effects to the underlying and the inferred down-gradient groundwater flow system. The boundaries were informed by the results of earlier numerical groundwater flow simulations in support of feasibility level pit slope designs [*Wardrop*, 2012]. The limits of the LSA are shown

on Drawing 02 and include the extents of two down-gradient mapped sand and gravel aquifers (Peterson Creek, No. 0278 and Davidson Creek, No. 0277) and the majority (i.e. down- and cross-gradient extent) of an underlying mapped bedrock aquifer (Sugarloaf Hill, No. 0276). The majority of the northern and eastern extents of the LSA are constrained by the limits of the aforementioned aquifers. The boundary south of the Davidson Creek Aquifer, (i.e., the eastern and southern limit of the LSA) was set to coincide with the limits of the Anderson Creek and Peterson Creek watersheds [iMapBC, 2013] West of the Sugarloaf Hill Aquifer, the northern limit of the LSA was set to coincide with Hughes Lake. The western limit of the LSA was delineated based on an inferred groundwater flow path between Chuwels Mountain and Hughes Lake.

3.0 EXISTING INFORMATION AND ASSESSMENT METHODS

The baseline groundwater assessment was conducted by compiling and reviewing the available geological, hydrogeological, geotechnical and groundwater quality data obtained for Abacus Mining and Exploration Corporation (AME) and KAM from previous and ongoing investigations on the property. Key site specific information considered in the development of this report includes data from the following sources:

- The 3-dimensional geologic model in the area of the planned open pit created based on drilling completed since 1980 [Wardrop, 2009].
- A hydrogeology study completed by Klohn Leonoff Consulting Engineers in 1988 for the historical Ajax Mine [Klohn Leonoff, 1988].
- A hydrogeological assessment carried out in 2005 by Piteau Associates [2006] for the nearby New Afton site for New Gold Inc.
- Hydrogeological, geotechnical, hydrometeorological and water quality investigations completed by Knight Piesold (KP) since 2007 in support of various levels of environmental assessment and permit applications for the Project [*Knight Piesold*, 2008; *KP*, 2007; 2008a; b; 2009; 2011a; 2012a; b; 2013a; b; 2014a; b; c; d].
- GIS datasets of surficial geologic materials mapped near the Mine Site [*Keystone*, 2008; *KP*, 2014b].
- Various hydrogeological and geotechnical investigations, groundwater monitoring, water management and modelling studies completed by BGC since 2009 in support of the Ajax pit slope design, pit depressurization, mine rock pile and plant infrastructure design and baseline surface water and groundwater assessments to support permitting [*BGC*, 2011a; b; c; d; 2012a; b; 2013a; b; c; 2014a; b; 2015a; f].
- Data from SI and design studies carried out by Golder Associates Ltd (Golder) in 2010 and 2011 near the Mine Site [*Golder*, 2011a; b].
- A compilation of regional structural geological information and preliminary results of mapping of the Edith Lake Fault Zone (ELFZ) (i.e., an area of potential faulting to the south of the Mine Site) completed in 2011 and 2014 under the direction of BGC [*BGC*, 2014b; *Campbell*, 2011; 2014]. Results from drilling investigations and hydraulic testing of the ELFZ in 2015 are also considered [*BGC*, 2015b].
- Stratigraphic information from boreholes advanced into mine rock from previous mining activities in the LSA under the supervision of Lorax in 2012.
- A preliminary hydrogeology conceptualization and results from site investigations completed around the Jacko Lake area by Klohn Crippen Berger Ltd. (KCB) in 2013 and 2014 [*Klohn Crippen Berger*, 2013; 2015]. The site investigation report completed by KCB is included as Appendix A to this document.
- Preliminary drill hole results from the 2014 condemnation drilling program around the TSF area provided by KGHM.

- Hydraulic testing of the Peterson Creek Aquifer to the south east of the planned open pit under the supervision of BGC [*BGC*, 2015g],
- Geotechnical investigations (including test pitting, drilling and packer testing) in the area of the TSF under the supervision of KP [*KP*, 2015a].

In addition to the above noted site specific information, publicly available information from the hydrogeological and geotechnical data compilation CD for the Aberdeen area (provided to AME in 2012 by the City of Kamloops) were also consulted [City of Kamloops, 2012]. Pertinent material for regional assessment includes data compiled from the WRBC atlas [*BC MOE*, 2014], as well as information from other publicly available maps, air photos and reports referenced herein.

The locations of specific boreholes, test pits, and groundwater monitoring locations considered in this assessment are shown on Drawing 03. The data sources that were considered during this assessment are discussed in the Sections 3.1.1 through 3.1.5.

3.1.1. Geological Data

3.1.1.1. Regional Study Area

As part of the Feasibility Study (FS) for the Project, BGC retained Dr. K. V. Campbell of Earth Resource Surveys Inc. (ERSi) to complete a review of the structural geology within the project and surrounding areas [Campbell, 2011]. Dr. Campbell's report includes a summary of regional geology based on the 1987 study of the Iron Mask Batholith by Kwong [1987], the 2005 digital compilation by the B.C. Geological Survey Branch [Massey et al., 2005] and the study of porphyry Cu-Au deposits of the Iron Mask Batholith by Logan and Mihalynuk [2005]. A compilation of regional faults mapped by these authors is also provided in the report.

The bedrock geology within the Aberdeen area, just north of the LSA, has been mapped in detail by Read [1998] on behalf of the City to support groundwater and slope stability studies in Aberdeen. Read [1998] provided geological and structural interpretations based on data archived by the City, which are summarized in Golder [2008c]. Geological contacts and faults described in the work of Golder [2008c] were considered in this assessment.

BGC's understanding of regional surficial geology is based on publicly available maps, stereographic aerial photographs and reports [Armstrong and Fulton, 1965; Brennand and Lian, 2009; Fulton, 1967; 1969; 1975; Fulton and Smith, 1978; GSC, 1995; Johnsen, 2004; Johnsen and Brennand, 2004; National Air Photo Library (Ottawa), 1964; 1971]. The thickness of surficial deposits at the regional scale has been interpreted based on compiled drill data from the WRBC database [*BC MOE*, 2014], digital files and reports provided by the City of Kamloops [2012] and borehole data reported by Piteau Associates [2006].

3.1.1.2. Local Study Area

Data for delineation of surficial deposit thickness and hydrostratigraphic characterization on the Ajax property are available from mapping and drilling investigations completed by BGC,

KP, KCB, KAM, Golder and Keystone Wildlife Research Ltd. (Keystone). Site specific geologic data considered in this baseline assessment include:

- One-hundred and twenty-eight (128) test pits and 82 vertical boreholes (<10 to 200 m deep) advanced by BGC between 2010 and 2014 near the Mine Site.
- Fourteen (14) inclined geotechnical drill holes (141 to 475 m long) advanced into bedrock by BGC between 2010 and 2013 in the planned open pit area.
- Four-hundred and twenty-six (426) test pits[1] and 97 vertical boreholes (<10 to approximately 100 m deep) advanced by KP between 2007 and 2014 within the Mine Site.
- Four (4) inclined and 3 vertical geotechnical drill holes (18 to 250 m long) advanced by KCB in 2014 adjacent to the planned open pit near Jacko Lake.
- Four (4) boreholes drilled by Lorax in 2012 into mine rock emplaced during previous mining activities within the existing Ajax East Pit and south of Peterson Creek.
- Thirty-three (33) vertical drill holes advanced by KAM as part of the Project condemnation drilling program completed in 2014.
- Fourteen (14) test pits and 13 vertical geotechnical boreholes (10 to 30 m deep) advanced by Golder in 2011 and located to the west of the Mine Site.
- A GIS dataset of surficial materials from terrain mapping in the Mine Site prepared by Keystone in 2008 [Keystone, 2008] for AME[2].
- A GIS dataset of surficial landforms in the Mine Site prepared by KP in 2014 [*KP*, 2014b].
- Preliminary seismic refraction lines run by Frontier Geosciences Inc. under the supervision of KP in 2014 along the alignments of the proposed main/north, east, south and south east embankments of the TSF.
- Data from selected boreholes near the Mine Site from public well records compiled from the WRBC database [*BC MOE*, 2014].

This assessment also considers interpretations from drill hole and test pit data from investigations completed in the LSA area by Klohn Leonoff [1988] on behalf of Afton Operating Corporation.

The available borehole and test pit log data used in this assessment are included in Appendix A and B (Project and area SIs) and Appendix C (WRBC database). Preliminary cross sections interpreted from borehole logs and seismic surveys provided by KP are included in Appendix D.

In addition to the data sources noted above, the three-dimensional geologic and structural model created by AME and updated by KAM was available to BGC for subsurface material delineation in the Mine Site. The version of the geological model that was available to BGC to

[1] Approximately 380 test pits were completed by KP in 2014. Only depth to bedrock information from 72 test pits was available at the time this report was prepared.
[2] Mapping completed by Polar Geosciences in 2007. Dataset compiled by Keystone in 2008 and provided to BGC by VAST Resources on May 9, 2013.

support this work was received on September 22, 2014; the structural model supporting this work was received on February 2, 2011.

During 2014, a preliminary investigation into a potential zone of faulting (i.e., the ELFZ) to the south of the existing Ajax pits was completed by Dr. K. V. Campbell of Earth Resource Surveys Inc. (ERSi) under the direction of BGC [Campbell, 2014]. This investigation included a review of published information on the area of faulting and a re-assessment of airborne electromagnetics acquired in 1994 supplemented with airborne electromagnetics acquired in 2014. Three days were spent in the field examining outcrops in the main area of interest extending from Jacko Lake southeast to about 1.5 km east of Goose Lake. Recent geotechnical and condemnation drilling results proximal to the fault were also reviewed.

During 2015, BGC completed a drilling investigation targeting the ELFZ to preliminary characterization of the structure, orientation and hydraulic properties of the potential fault zone. Core recovered during this investigation was geomechanically logged by BGC and geological logging of the rock core was completed by KAM geologists. Acoustic televiewer (ATV) surveys and packer tests were carried out in the drill holes. Drilling, logging, testing and survey methods completed as part of the ELFZ drilling investigation are discussed in detail in the SI report provided in BGC [2015b].

3.1.2. Groundwater Level Monitoring Network

A total of 118 instruments on the Ajax property are actively being monitored for seasonal baseline groundwater level characterization. This network consists of 24 VWPs and 94 standpipe piezometers. Installation details and monitoring rationale for these locations are summarized in Table 2 and shown on Drawing 03. More than 80 additional locations are available to monitor groundwater levels on site (Drawing 03); however the data collection program for the baseline assessment of seasonal groundwater levels was limited to the network described in Table 2, which is referred to as the active groundwater monitoring network, or active monitoring network in this report.

The active monitoring network consists of:

- Twenty-nine (29) standpipe piezometers installed into boreholes drilled in 2014 by BGC for KAM as part of the groundwater monitoring program designed around the current GA to the support the Project EA [*BGC*, 2015f]. Eleven (11) of these piezometers were installed into surficial deposits and 18 were installed into bedrock.
- Twenty three (23) standpipe piezometers installed into geotechnical drill holes between 2010 and 2011 by BGC as part of the Project FS-level design work completed for AME [*BGC*, 2011a; d]. Four (4) of these piezometers were completed in surficial deposits, six (6) were completed in bedrock and eleven (11) were completed across a bedrock/surficial geology contact to characterize the geotechnical nature of the contact for foundation design purposes.

- Six (6) VWPs installed in holes drilled for a pumping test conducted by BGC for AME in the winter of 2010-2011 in support of the Project FS [*BGC*, 2011c]. Two (2) of these were installed into surficial deposits and 4 were installed into bedrock.
- Eleven (11) VWPs installed into bedrock in the open pit area by BGC between 2009 and 2013 as part of Prefeasibility Study (PFS) and FS-level mining geotechnical assessment work for AME [*BGC*, 2011b] and geotechnical investigations to support previous permit applications for the Project [*BGC*, 2012a].
- Twenty-eight (28) standpipe piezometers installed into boreholes by KP during hydrogeological investigations carried out in 2007 and 2011 on behalf of AME and KAM in support of various levels of permitting and environmental assessment [*KP*, 2007; 2008b; 2011a]. Twelve (12) of these piezometers were installed into surficial deposits and 16 were installed into bedrock.
- Nine (9) standpipe piezometers installed into geotechnical boreholes by KCB in 2014 for KAM as part of hydrogeological assessments in support of the Project EA (Appendix A). Four (4) of these piezometers were installed into surficial deposits and 5 were installed into bedrock.
- Four (4) VWPs installed into bedrock within geotechnical boreholes by KCB in 2014 for KAM as part of hydrogeological assessments in support of the Project EA (Appendix A).
- Five (5) standpipe piezometers installed by Golder as a part of geotechnical investigations in the Mine Site [*Golder*, 2011a; b]. Two (2) of these piezometers were installed into surficial deposits and 3 were installed into bedrock.

Dataloggers are installed at many of the above noted locations to provide continuous baseline water level data (i.e., 4 measurements collected per day or more) for the Project site. The dataloggers installed in standpipe piezometers are Solinst- brand dataloggers (i.e., Leveloggers), and are deployed within the PVC pipe below the potentiometric surface. RST-brand dataloggers (i.e., DT2055 and DT2011) have been installed into custom made enclosures and are connected to the VWP cables at the drill hole collars at locations where VWPs were installed by BGC. Locations with dataloggers are summarized in Table 2.

The active monitoring network is maintained by KAM field staff and is visited on an approximate quarterly basis in order to complete data downloads from locations with dataloggers and to collect manual measurements from the remaining locations.

3.1.3. Hydraulic Head Database

Groundwater elevation data for baseline characterization were available from a total of 445 locations in the RSA. This incorporates data collected from the active monitoring network (Table 2) as well as data from additional locations on site and within the RSA. The full hydraulic head database was used for characterization of average annual conditions (i.e., interpretation of piezometric surfaces and groundwater flow directions), whereas data from the active monitoring network was used for the assessment of seasonal groundwater level variations.

The database used for this assessment includes:

- Historic measurements from 242 locations reported by the British Columbia Ministry of Environment (BC MoE) in the Water Resources of BC (WRBC) database both in the RSA and LSA [*BC MOE*, 2014].
- Historic measurements at monitoring wells/VWPs from 20 locations reported by Piteau Associates [2006], and located near the New Afton Mine to the west of the Project site.
- Historic measurements from 42 monitoring locations compiled from digital data provided by the City [2012], and located in the Aberdeen subdivision area to the north of the Project site.
- Manual measurements collected intermittently between 2010 and 2014 from more than 141 standpipe piezometers, VWPs and a 200m deep prototype depressurization well installed by BGC and others on the Project site.
- Automatic measurements collected with electronic dataloggers since 2011 from select standpipe piezometers and VWPs installed by BGC and others on the Project site3.

Historic measurements (i.e. data from WRBC, Piteau Associates [2006] and the City [2012]) are provided in Appendices D and E. It should be noted that WRBC data likely do not represent the phreatic surface at the time of measurement because the water table would have been disturbed by drilling. In addition, many of the WRBC measurements do not represent present-day conditions. For these reasons, the WRBC data are considered to be less reliable than data collected by BGC and those documented in other, more recent consultant reports.

The remainder of the hydraulic head database (i.e. measurements collected by KAM, BGC, KP, KCB and Golder from instruments installed on the Project site) was filtered to exclude data that were collected during known disturbance events (i.e. slug tests, well purging, pumping and drilling) so that the values in this assessment were considered to be representative of baseline conditions at the site. Baseline hydraulic head data from the active monitoring network are plotted with respect to time on the hydrographs provided in Appendix G.

3.1.4. Hydraulic Conductivity Data

The available hydraulic conductivity data within the RSA were compiled to support the baseline groundwater hydrology assessment for the Project. The compiled dataset includes estimates from tests conducted by BGC, KP, KCB and Golder for the Project and nearby New Afton Mine. Hydraulic conductivity values estimated from WRBC drill records for this assessment, as well as data compiled by Golder [2008c] for the City [2012] in the Aberdeen area are also noted and discussed.

In general, the data collected for the Project are considered to be of good quality. Similarly, data available from Piteau's investigations in the New Afton area [Piteau Associates, 2006] and from Golder's SIs and compiled data [*Golder*, 2008c] in the Aberdeen area are considered

[3] Data record is not continuous since 2011 for all locations where dataloggers are installed.

to be of good quality. Data from historical well records and the WRBC atlas were considered to be of variable quality and accorded a lower degree of reliability/significance for this assessment. The use of WRBC data for the estimation of hydraulic conductivity is discussed in Section 0 and Appendix I.

3.1.4.1. Hydraulic Conductivity Estimates from Tests Conducted by BGC and Others

A variety of testing methods have been employed by BGC and others to obtain estimates of hydraulic conductivity within surficial deposits and bedrock materials in the Ajax study area. These methods include rising and falling head (slug), packer, pumping and pump-in tests. Table 3 provides an inventory of tests completed on the Ajax property and surrounding area (i.e., approximately 10 km from the site at the New Afton Mine, Piteau Associates, [2006]). Descriptions of testing and analysis methods used are provided in Appendix H.

3.1.4.2. Other Hydraulic Conductivity Data Sources

<u>City of Kamloops Data</u>

Golder [2008c] summarizes various testing methods and present data used to estimate hydraulic conductivity of geological materials in the Aberdeen area, northeast of the Ajax site. This testing was conducted as part of a series of hydrogeological investigations completed on behalf of the City to confirm values reported in previous slope stability studies in Aberdeen. Single well response (slug) tests in piezometers in the Aberdeen neighborhood were used to determine the hydraulic conductivity of the screened zones. Results from a long-term pumping test as well as packer tests were also reported.

Golder [2008c] compiled the results from their hydrogeological investigations noted above, along with hydraulic conductivity estimates made previously by others. This compilation is reproduced in this report for completeness and is provided in Appendix J. Ranges in hydraulic conductivity for different rock types are discussed in Section 7.2.

<u>Estimates Using Water Resources of British Columbia (WRBC) Well Data</u>

Data from drill records for registered water wells noted in the search of WRBC database were examined to obtain order-of-magnitude hydraulic conductivity estimates for mapped aquifers in the RSA and LSA. Where well radii, approximate well yields and static water levels were available, an approximate hydraulic conductivity value was estimated using a Theim-Dupuit method (i.e. steady state unconfined flow to a well), and assuming a radius of influence of 550 m [*BGC*, 2011c]. Hydraulic conductivity estimates together with additional assumptions and details on the calculation method are provided in Appendix I.

Estimates based on the WRBC data appear to be biased towards higher values compared to SI or compiled data. This is possibly due to water well drillers targeting more hydraulically conductive zones for water supply. As noted in Section 3.1.3, the WRBC data are considered to be less reliable than data collected by BGC and those documented in other, more recent consultant reports. Hydraulic conductivity estimates obtained using data from the WRBC

database are therefore considered preliminary and to be less reliable than tests carried out by BGC and others. These estimates are not discussed further in this assessment.

3.1.5. Groundwater Quality Data

Groundwater sampling methods and results for the majority of available water quality data are reviewed in detail in KP [2013a] and [2014c]. Three (3) groundwater samples were collected from BGC10-PW01 by BGC as part of the pumping test scope of work completed in 2011 to characterize water quality that may be generated by pit slope depressurization wells (if any). Sampling methods and results are reviewed in detail in BGC [2011c].

4.0 PHYSIOGRAPHY AND CLIMATE

4.1. Regional Study Area

The RSA is situated within the Thompson Plateau physiographic region of the Interior Plateaus and Highlands Groundwater Region of British Columbia. The Thompson Plateau is bound in the north by the Fraser Plateau, in the east by the Okanagan and Shuswap Highlands and in the west and south by the Cascade Mountains. The main population centres within the Thompson River Plateau include Kamloops, Kelowna, Penticton, Princeton, Merritt and Cache Creek. The extent of the Thompson Plateau is shown on Drawing 04 [Zubel, 2001].

Holland [1964] described the Thompson River Plateau as a gently rolling upland of low relief, generally between 1,200 m and 1,500 m elevation. The plateau covers an area of approximately 28,500 km^2 and represents the late Tertiary erosion surface that has been dissected by three major rivers, i.e., Thompson, Similkameen and Okanagan and their tributaries. Other major hydrologic features include Kamloops Lake and Okanagan Lake [Zubel, 2001].

The Project RSA is located within the South Thompson River watershed (BC MoE, 2007 and Drawing 04). The South Thompson River and North Thompson River converge at Kamloops to form the Thompson River, which is the largest tributary of the Fraser River. The Thompson River flows approximately 15 km westward from this confluence into Kamloops Lake (a locally enlarged reach of the river). Kamloops Lake has a catchment area of 29,050 km^2, a surface area of 148 km^2 and is approximately 30 km long [*KP*, 2011b]. From Kamloops Lake, the Thompson River continues to flow westward to Ashcroft, then southwest to the confluence of the Fraser River near Lytton, BC (Figure 1).

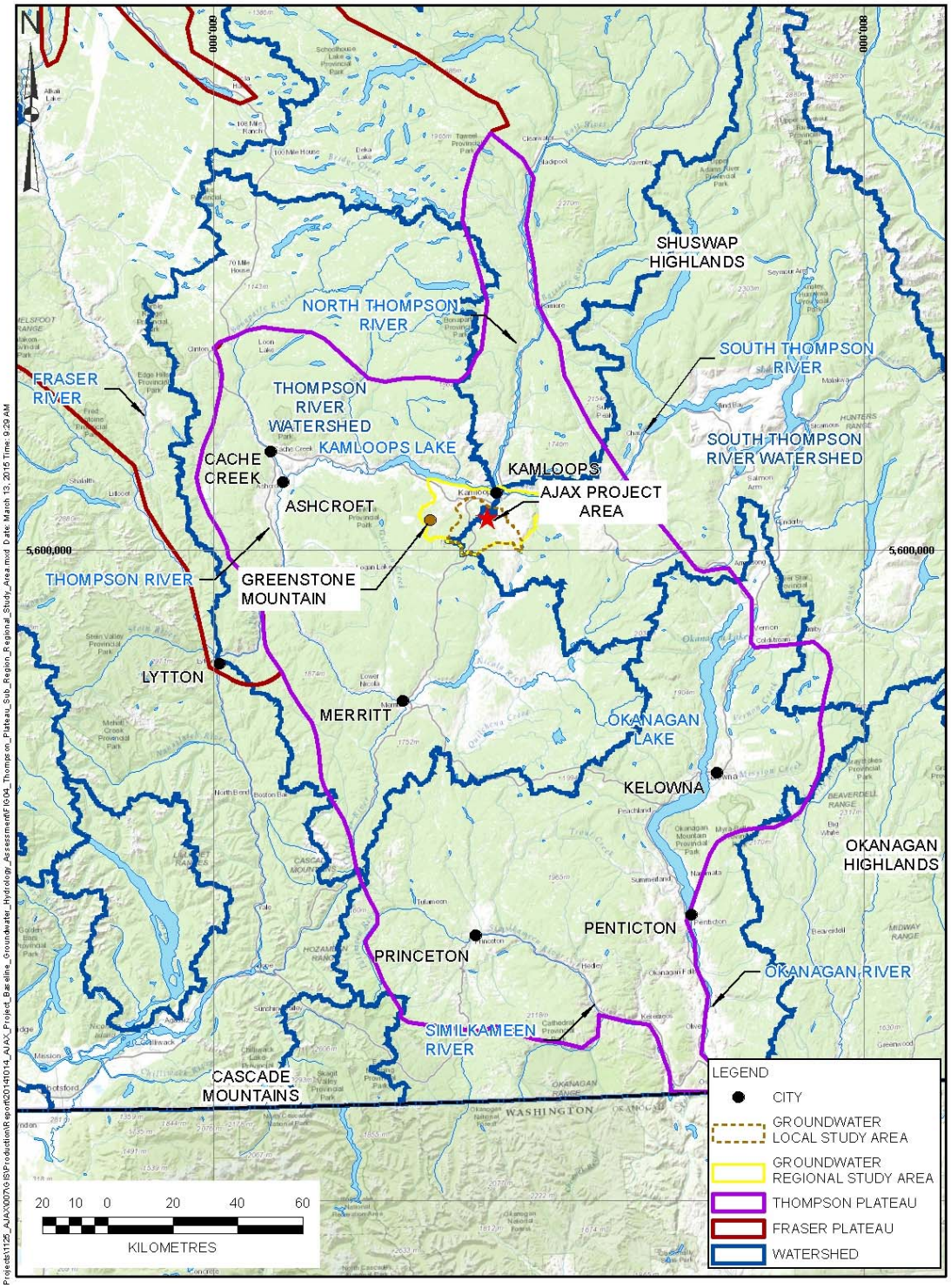


Figure 1. Thompson Plateau Sub-Region.

4.2. Local Study Area

The Project LSA is situated in an area of moderate relief with local elevations ranging from 800 m asl to 1,500 m asl. The area is characterized by rolling grasslands with timber at higher elevations. Forested areas consist mainly of Douglas fir, Lodgepole pine and Ponderosa pine. At lower elevations, vegetation typically consists of bunchgrass, sagebrush and prickly pear cacti [Keystone, 2008]. The main topographic feature of the LSA is the broad east-west and north-south valley of Peterson Creek (Peterson Creek valley).

Geomorphic landforms reflect the glacial history of the region. Prominent depositional and erosional features that have resulted from glacial recession include south and southeasterly trending drumlins, successions of melt water channels on sloping surfaces, and small depressions occasionally still occupied by ponds and lakes. Sugarloaf Hill is a prominent bedrock landform in the LSA and has an elevation of 1,130 m asl (Drawing 02).

KP [2011b] describe the drainage of the Mine Site as disrupted (i.e., due to previous mining and also to the glacial, periglacial and proglacial depositional environments). This has resulted in numerous shallow ponds, some of which are ephemeral and bordered with precipitate encrustations. Other ponds in the region have been raised with dams. The principal watercourses in the area run northeast and typically consist of north and east flowing sections that follow the principal lineation pattern.

The Project lies fully within the Peterson Creek watershed (Drawing 02). The largest water body near the Mine Site is Jacko Lake, which is located adjacent to the planned Ajax open pit. The most recent bathymetric survey of Jacko Lake was completed by Frontier Geoscience in 2014. That survey found a maximum water depth of 24 m and a volume of 4.2 Mm^3 at the invert of the spillway outlet (i.e., 892.0 masl). Smaller alkaline lakes are common within the Peterson Creek watershed [*KP*, 2011b].

Peterson Creek originates at the Chuwels Mountain and flows north through a wide valley to Jacko Lake. This portion of the creek is referred to as Peterson Creek (Upper). Jacko Lake drains an area of approximately 37 km^2, about half of which is located above an elevation of 1,200 masl. Historical records indicate that Jacko Lake has been managed for human use since the early 1900s, when the outlet to Peterson Creek was raised to impound water for irrigation. This earthfill dam has since been raised on several occasions and is currently about 3 m high, impounding a volume of about 4.2 Mm^3 [*Frontier Geosciences Inc*, 2014].

At higher water levels, flow discharge through a spillway located adjacent to the dam. But below elevation 892.0 masl, the spillway invert, flows are released through a low-level outlet to support downstream water licenses (see BGC [2015a]). The outlet consists of a 17 m long concrete culvert with a sluice gate at its inlet [*BC MOE*, 1980]. The pipe discharges immediately downstream of the dam and flows into a small concrete weir structure located approximately 30 m downstream of the dam, which overflows into the natural Peterson Creek channel. Jacko Lake is an important water body for recreational fisheries and has been stocked with rainbow trout.

The portion of the creek downstream of Jacko Lake is referred to as Peterson Creek (Lower). Downstream of Jacko Lake, the creek flows east through Knutsford and north again through downtown Kamloops ending at the confluence with the South Thompson River. Within the downtown core of Kamloops, the majority of Peterson Creek (Lower) is contained within culverts and channeled through concrete waterways to its confluence with the South Thompson River (City of Kamloops 2001). Peterson Creek (Upper and Lower) has a mainstem length of approximately 40 km and drains a watershed area of approximately 130 km^2.

Significant tributaries of Peterson Creek (Lower), from west to east, include Keynes Creek, Humphrey Creek, and Davidson Brook. Keynes Creek discharges into Peterson Creek (Lower) from the south immediately downstream of Jacko Lake. Keynes Creek drains an area of 11.4 km^2 and the proposed TSF for the Project is located in this tributary watershed.

Humphrey Creek is located to the immediate east of Keynes Creek, and also flows from south to north. Humphrey Creek originates from Edith Lake, flowing north over a distance of approximately 2.5 km to the confluence of Peterson Creek (Lower) draining an area of approximately 5.8 km^2. Edith Lake is similar to Jacko Lake in that it is stocked with fish and has a dam, which was originally constructed to support downstream water licenses on Peterson Creek (Lower). The lake is a popular destination for recreational fishing, particularly during the winter for ice fishing. Moving further to the east, Davidson Brook discharges into Peterson Creek (Lower) in the vicinity of Knutsford. This tributary flows from south to north and has a watershed area of approximately 6.2 km^2.

Drainages on the north side of Peterson Creek (Lower) are best described as disrupted, with numerous shallow ponds, some of which are ephemeral containing alkaline water and bordered with saline soils and mineral deposits.

There are a number of endorheic basins in the area of the Mine Site. An endorheic basin, also called a terminal or closed basin, is a closed drainage basin that retains water and allows no surface outflow to other external bodies of water, such as a river, but converges instead into lakes or swamps, permanent or seasonal, that equilibrate through evaporation. Endorheic basins near the Project are discussed in BGC [2015a] and include Inks, Nelson and Wallander Lakes, which are located northwest of Jacko Lake, and an unnamed lake located north of the existing Ajax Pits (Drawing 03).

Water storage and irrigation licenses have been present throughout the region since at least 1877 for Jacko Lake and Peterson Creek. Water licenses are described in more detail in BGC [2015a].

4.3. Climate

The climate of the Ajax Mine site is typical of the dry BC Interior with generally low total precipitation, high evaporation, and correspondingly low streamflow rates. Lying within the rain shadow of the Coast Mountains, this area has a semi-arid steppe climate characterized by generally cool dry winters and hot, dry summers, with low humidity. Convective storms are

frequent in the summer months, and as a result precipitation is generally highest in June and July [*KP*, 2013b].

Meteorological data have been collected at the site since August 2010 and include records of temperature, relative humidity, precipitation, and wind speed and direction. Mean annual precipitation for the site has been evaluated by KP [*KP*, 2013b; 2014a] who analyzed active and inactive regional climate stations throughout the area, several of which have two decades or more of data. Based on this analysis, KP [2014a] estimated average annual precipitation for the site at 336 mm, distributed as summarized in Table 4. This annual precipitation applies to an elevation of 950 m. Approximately 30% of the annual precipitation is estimated to occur as snow.

Annual potential evapotranspiration (PET) has been estimated by KP [2014a] at 579 mm using long-term synthetic temperature data; monthly values are shown on Table 4. In addition, sublimation between November and February has been estimated at 28 mm [*KP*, 2014a]. Potential evapotranspiration in the area of the Mine Site is discussed further in Section 9.2.2.

The nearest active manual snow survey station is the Highland Valley station (ID No. 1C09A), which is operated by the Ministry of Forest, Lands and Natural Resource Operations (FLNRO) This station is located 40 km southwest of the study area at an elevation of 1475 m and has been in operation since 1966. Long-term normals for this station show a majority of the snowpack melting in April and May. The normal snowwater equivalence on April 1 is 83 mm compared to 20 mm on May 1 and 3 mm on May 15. In most years, the snowpack has completely melted by the end of May [*BGC*, 2015a].

5.0 GEOLOGY

5.1. Bedrock Geology

5.1.1. Regional Study Area

Three principal sources of regional geology information are the 1987 study of the Iron Mask Batholith by Kwong [1987], the 2005 digital compilation by the B.C. Geological Survey Branch [Massey et al., 2005] and the study of porphyry Cu-Au deposits of the Iron Mask Batholith by Logan and Mihalynuk [2005]. As noted in Campbell [2011], there are only minor variations in the boundaries of the mapped rock units and in the configuration of the major faults between these three studies.

The bedrock geology mapped within the RSA is shown on Drawing 04, based primarily on the digital compilation of the BCGS [Massey et al., 2005]. Detailed mapping of bedrock geology within Aberdeen based on the work of Read [1998] is shown on Drawings and 04 and 05. A stratigraphic column is shown on Table 5.

From oldest to youngest, the bedrock geology within the RSA is comprised of:

- Triassic Nicola Group (volcanics, volcaniclastics, and picrite)
- Late Triassic to Early Jurassic Iron Mask Batholith (dioritic intrusive rocks)
- Eocene Kamloops Group (volcanic and the principal rock types mapped within the RSA belong to sedimentary rock groups).

The Nicola Group consists of a thick sequence of subaerial and submarine mafic to intermediate volcanic flows, volcaniclastics and related sedimentary rocks. Volcanic rocks of the Nicola Group (uTrNE) generally occur within the western portion of the RSA, whereas sedimentary facies (uTrNsf) occur east of the LSA (Drawing 05). The Nicola Group has been intruded by the northwest trending Iron Mask Batholith, an alkalic body about 34 km long and up to 5 km wide. Adjacent to the Batholith, Nicola Group rocks are characterized by basaltic to andesitic clinopyroxene phyric flows and flow breccias, light green massive tuffs and bedded ash to lapilli tuffs. Nicola Group rocks are also often foliated near the contact with the Iron Mask Batholith and can contain minor amounts of copper mineralization [Stokes, 2007].

The Iron Mask Batholith is comprised of two plutons: the smaller Cherry Creek pluton in the northwest of the RSA where exposures straddle Kamloops Lake and the larger Iron Mask pluton in the southeast. As the Iron Mask Batholith is associated with the previously noted mining projects of the region, the geology of this composite intrusion has been reviewed by multiple authors. Four major emplaced phases are recognized [Kwong, 1987]:

- Iron Mask Hybrid phase (diorite)
- Pothook phase (diorite)
- Sugarloaf phase (diorite)
- Cherry Creek phase (syenite, monzonite, and diorite).

The Ajax Project targets ore zones related to the Sugarloaf diorite (LTrJIS) as it occurs at the faulted contact of the Nicola Group volcanics (uTrNE) and the Iron Mask Hybrid diorite (LTrJIH) at the southern limit of the Iron Mask Batholith (Drawing 05).

The Middle Eocene rocks of the Kamloops Group (EKaT, EKav) unconformably overlie the Nicola Group and the Iron Mask Batholith to the north and northwest of the Mine Site. The unconformity is north-dipping and postdates mineralization within the New Afton area [Logan and Mihalynuk, 2005]. The extent of the Kamloops Group within the RSA is shown on Drawing 04; and in more detail just north of the LSA on Drawing 05. The sequence has been sub-divided into the Tranquille and Dewdrops Flat Formations (see Table 5), which are principally comprised of sedimentary rocks and volcanic flows/breccias, respectively.

The Tranquille Formation is approximately 500 m thick, and conformably underlies the 1300 m thick Dewdrops Flats Formation [Ewing, 1978]. North of the New Afton area, a thick sequence of sedimentary rocks belonging to the Tranquille Formation separates the Iron Mask and the Cherry Creek plutons (Drawing 04). Mapped Kamloops Group rocks extending east and south from this area generally consist of volcanics belonging to the Dewdrop Flats Formation [Massey et al., 2005]. Tranquille sediments are mapped through Aberdeen, just north of the Mine Site [Massey et al., 2005; Read, 1998]. Ewing [1978] indicates that these rocks consist of a combination of tuffaceous, fine-grained sediments with low organic contents and andesitic pillow breccias, and could be greater than 250 m thick. The work of Read [1998] reported in Golder [2008c] indicates that this package can be as thin as 150 m in some parts of the subdivision.

Geotechnical work referred to in Golder [2008c] indicates that areas underlain by Kamloops Group sediments within Aberdeen are susceptible to large scale instability under adverse conditions of slope and groundwater pressure at the contact with the overlying Quaternary materials.

Rock types, age relationships and general descriptions of the above units are summarized in Table 5, along with other mapped bedrock geologic units within the RSA.

5.1.2. Local Study Area

The available mapping data indicate that, with the exception of the sedimentary rocks of the Nicola Group, the principal rock types described in Section 5.1.1 are mapped within the LSA. However, Nicola Group sedimentary rocks (mudstones, sandstones and occasional conglomerates) were encountered in condemnation drill holes completed by KAM in the TSF area during 2014. The volcanics, tuffaceous sandstones, siltstones, and shales of the Kamloops Group have not been identified in the immediate vicinity of the Mine Site to date; however, these rocks have been mapped in faulted contact with the Batholith and Nicola volcanics within the LSA near New Afton and Aberdeen (Drawing 05).

To the west of the Iron Mask Batholith (southeast of Jacko Lake), a restricted sequence of ultramafic volcanic rocks crop out stratigraphically above the Nicola Group rocks within the

LSA (Drawing 05). These ultramafic volcanic rocks have been correlated with serpentinized picritic basalts which occur as wedges or slivers in major fault-related structural corridors within the Batholith [Snyder and Russell, 1994]. Picrite occurrences within the Iron Mask Batholith have been interpreted to be part of the Nicola Group stratigraphy, predating the Iron Mask intrusion [Logan and Mihalynuk, 2005]. Picrite occurrences as included in the 3D geologic model maintained by KAM are shown on Drawing 05.

5.2. Quaternary Geology

The materials that comprise the surficial materials of the RSA were deposited during the Quaternary and consist predominantly of Kamloops drift as defined by Fulton [1967]. This material was deposited during deglaciation associated with the decay of the Cordilleran Ice Sheet, which occurred in the area between 10,000 and 13 000 years ago. There are also more recent, post glacially deposited fluvial sediments mapped within the RSA [Fulton, 1975]. For the purpose of this report 'Drift' is material that was deposited during glaciation, while 'sediments' refer to material that was deposited in a non-glacial event [Fulton, 1967; Fulton and Smith, 1978].

BGC's review of available reports and publications for the area and of site data suggests that the thickest surficial deposits in the RSA are located within valleys and other topographic depressions. Where the deposit is sufficiently thick and consists of glaciofluvial sand and gravel, it is potentially a significant aquifer, as defined by the British Columbia Ministry of Environment (BC MOE). These deposits occur within the areas mapped as the Peterson and Davidson Creek Aquifers (discussed in Section 6.0). A discussion of the type sequence and depositional model for these deposits is included in this assessment.

The mapped distributions of unconsolidated materials and their thickness are discussed in Section 5.2.1. The discussion of a reference sequence or "type stratigraphy" and the associated depositional model for the deposits in valleys, topographic depressions and the Peterson Creek valley are discussed in Sections 5.2.2 and 5.2.3, respectively.

5.2.1. Material Distribution and Thickness

5.2.1.1. Regional Study Area

Kamloops Drift within the RSA can be broadly characterized as till, although localized thin lenses of sand and gravel may be present in the till. The tills are laterally discontinuous, and extend from the Thompson Valley in the north portion of the study area to the Chuwels Uplands in the south portion of the study area.

In addition to the till, glaciofluvial deposits were identified in the area [Fulton, 1967]. These deposits, which consist of thick sequences of sand and gravel are sparsely distributed throughout the RSA, although several accumulations have been mapped near the eastern boundary of the LSA. As noted above, some of these deposits coincide with the mapped

Peterson and Davidson Creek Aquifers (Nos. 0278 and 0277), and the Cherry Creek Valley Aquifer (No. 0728) near the north-western boundary of the RSA (Drawing 02).

Glaciolacustrine deposits have also been mapped with the RSA [Fulton, 1967]. These deposits consist of rhythmically bedded silt, sand and clay with occasional sequences of sand and gravel. These deposits are predominately found south of Kamloops Lake/Thompson River valleys.

Material that was deposited post-glacially within the RSA consists of accumulations of alluvium, fan, bog and landslide deposits. These are found within the Kamloops Lake/Thompson River area, and Campbell Creek. The distribution of the deposit types near the Mine Site are based on the mapping of Fulton [1975] and are shown on Drawing 04. The various deposits, associated depositional environments and age relationships of geologic events are summarized in Table 6.

In the Aberdeen area, the descriptions of Quaternary-aged materials are described by Golder [2008c]. The descriptions are consistent with Fulton's mapping, with the exception of an area of bedded gypsum (referred to as "gypsum spring" in Golder [2008c]). . Materials in this area comprise a general assemblage of swelling clays/bentonite that are inferred to have developed due to alteration of tills along the contact with the underlying Kamloops Group; the area is shown on Drawing 05.

Drill hole records for the area record indicate that the range of surficial deposit thickness is from less than 5 m to greater than 120 m in the RSA [*BC MOE*, 2014]. Unconsolidated material thicknesses greater than 50 m within the creek, stream, lake and river valleys of the RSA are reported in the drill records. The thickness of surficial materials was interpreted from the available borehole and test pit data and mapped locations of outcrop within the RSA and is shown on Figure 2. The interpreted bedrock topography based on these data is shown on Figure 3.

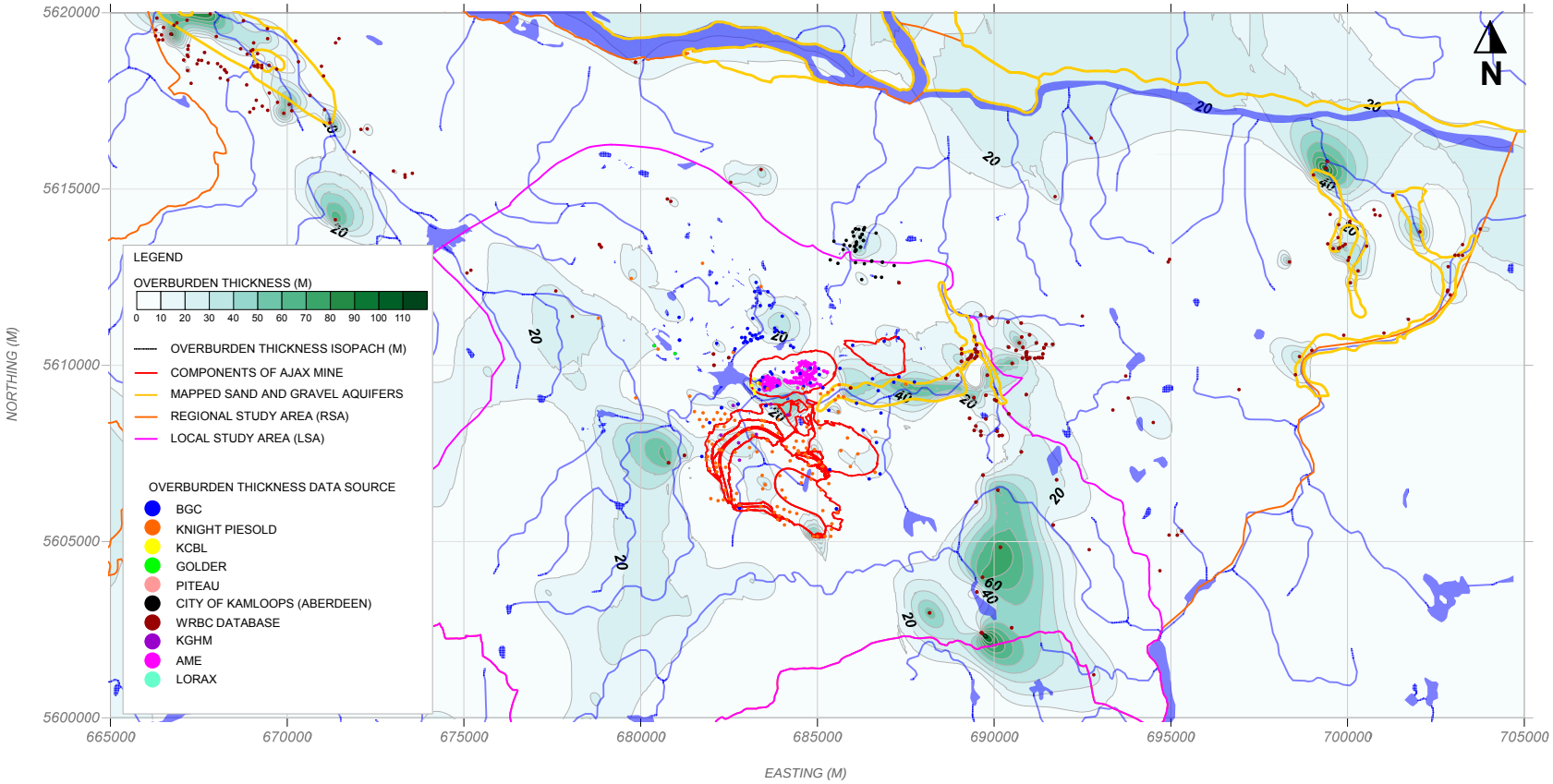


Figure 2. Interpreted Thickness of Surficial Deposits within the RSA.

Notes:

1. Surficial deposit thickness isopach generated by Kriging with linear Z transform at a 25m x 25 m grid spacing using depth to bedrock data from borehole logs.

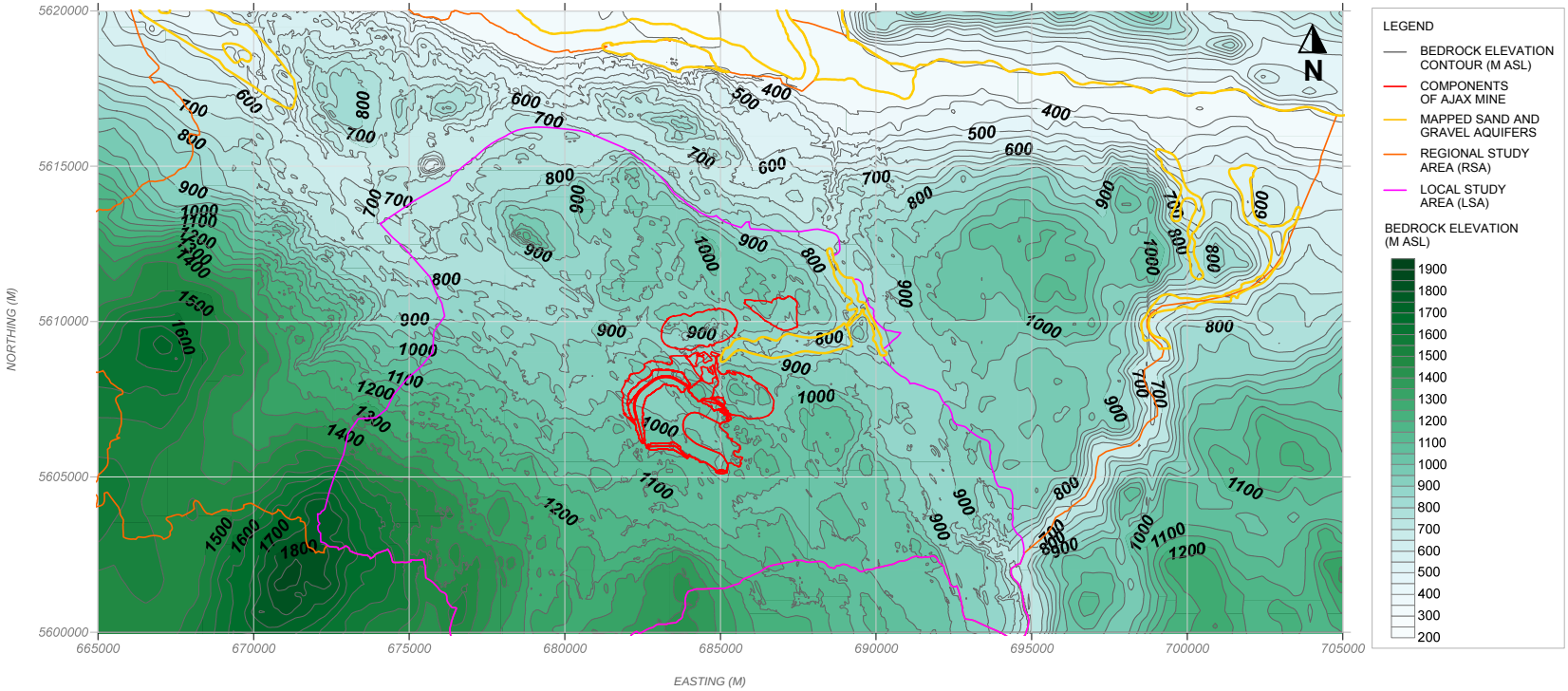


Figure 3. Interpreted Bedrock Topography within the RSA.

Notes:

1. Bedrock elevation contours generated by Kriging with linear Z transform at a 25m x 25 m grid spacing using depth to bedrock data from borehole

5.2.1.2. Local Study Area

The surficial materials within LSA was deposited glacially and post-glacially. The Kamloops Lake Drift is the predominant unconsolidated material mapped within the LSA. The terrain and landform GIS datasets from Keystone [2008] and KP [2014b] and the regional mapping by Fulton [1975] indicate that surficial materials within the LSA generally consist of widespread discontinuous glacial till with occasional sands and gravels that form hummocks. The distribution and age relationships of materials mapped by these sources is summarized in Table 6 and on Drawing 06.

Bedrock outcrops have been mapped near the limits of the TSF, to the north of the SMRSF and scattered around Jacko Lake and the open pit area. Weathered bedrock outcrops have been mapped in the existing Ajax East Pit area and to the north of the Mine Site, mostly north of Jacko Lake.

Surficial materials in the LSA that were emplaced during the Fraser glaciation (i.e., Kamloops Lake Drift) were deposited by glacial and glaciofluvial processes. Textural descriptions for these deposits according to Keystone [2008] and Fulton [1975] and their mapped locations with respect to the Mine Site are as follows:

- Glaciofluvial deposits classified as terrace deposits, delta terraces, kettle terrace, rill complexes and hummocky gravels. These deposits include the Peterson and Davidson Creek Aquifers (i.e., located south of the planned open pit and EMRSF and to the west of the EMRSF), and consist broadly of gravel, sandy gravel and sand. Glaciofluvial materials have also been mapped within the TSF and to the south of the SMRSF footprints.
- Glacier-formed drumlinoid moraines that consist of till with lenses of sand, gravel and silt. These deposits have an undifferentiated texture and form sharp ridges with adjacent kettles. This is the most common surficial material within the study area and is mapped around all Project facilities.

Surficial materials deposited post glacially within the LSA were deposited in lacustrine, fluvial, eolian, colluvial and bog depositional environments (Table 6, Drawing 06). Textural descriptions of these deposits as reported by Keystone [2008] and their distribution with respect to the Mine Site are as follows:

- Lacustrine deposits consisting of rhythmically bedded fine sands, silts and clays. These deposits are located within ponds throughout the RSA and nave not been mapped near the Mine Site.
- Fluvial deposits consisting of loose unconsolidated, non-cohesive sand and silt. These are fans that formed floodplains and terraces. These deposits have been mapped in the Peterson Creek area, south of the planned open pit and EMRSF.
- Eolian deposits consist of silt and fine sand. They typically form a veneer, but form sand plains and dunes near the Mine Site. These deposits have been mapped along the south-western limit of the EMRSF.

- Colluvial/mass movement deposits consist of loose, unconsolidated sediments of various sizes that have been deposited at the base of hillslopes. These materials have been mapped near the eastern limit of the open pit, to the north of the WMRSF and near and within the footprints of the TSF, SMRSF and EMRSF.
- Bog and organic deposits consist of decayed plant material and form veneers in wetlands. These deposits are not common in the study area.

Surficial materials mapped in areas where the natural character of the ground surface was modified by human activity have been classified as "anthropogenic materials" by Keystone [2008]. Anthropogenic materials consist of fill used for roads and other construction, historic waste rock and tailings areas and mining haul roads. These materials were mapped within the planned open pit and stockpile footprints south of Peterson Creek (Table 6, Drawing 07). Considerable amounts of mine rock from previous mining activities have also been noted within the LSA at the New Afton Mine [Piteau Associates, 2006].

Surficial materials are less than 20 m (on average 5 m to 10 m) thick near the Mine Site. There are a few exceptions such as at the locations of drill holes MW11-10D, BGC14-018 and BGC14-PW01, where up to 80 m of sands, silts and gravels of glaciofluvial and/or glaciolacustrine origin were intercepted. The thicker surficial materials near the Mine Site is mainly restricted to the Peterson Creek valley and other topographic depressions. Surficial material is up to 41 m thick along the Keynes Valley bottom [*KP*, 2015a]. Thickness of surficial deposits interpreted from borehole, test pit and seismic refraction data[4] collected near the Mine Site is shown on Figure 4. The interpreted bedrock topography near the Mine Site is shown on Figure 5.

[4] Seismic refraction data were limited to surveys on the southeast dam at the time the interpolation was completed.

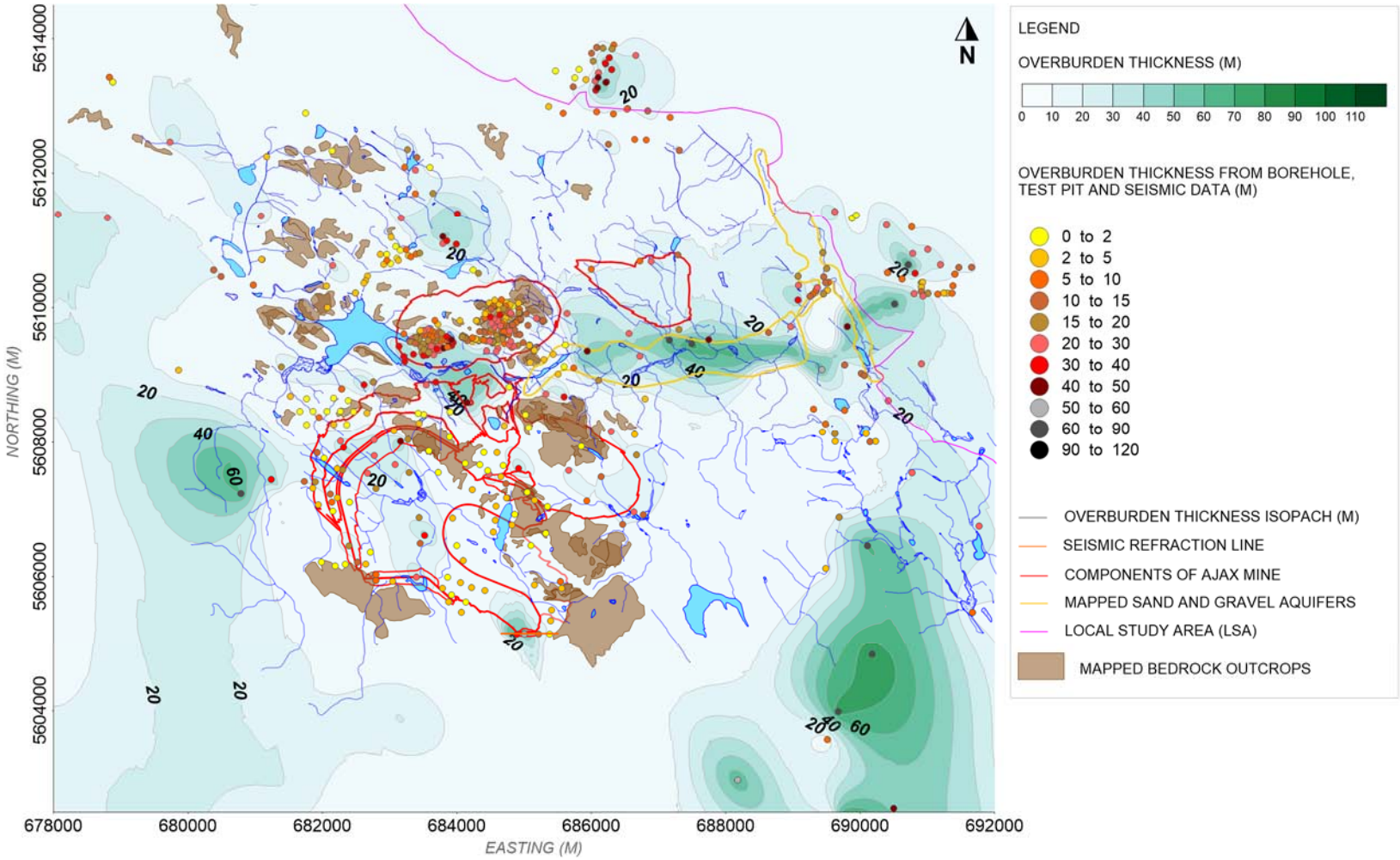


Figure 4. Interpreted Thickness of Surficial Deposits within the LSA.

Notes:
1. Mapped Outcrops are from Knight Piesold, 2014c and Keystone 2008
2. Seismic Refraction Line provided by Knight Piesold, 2014 (See Appendix D). Additional Seismic Refraction Lines were not available at the time of interpretation.
3. Surficial deposit thickness isopach generated by Kriging with linear Z transform at a 25m x 25 m grid spacing using depth to bedrock data from borehole logs.

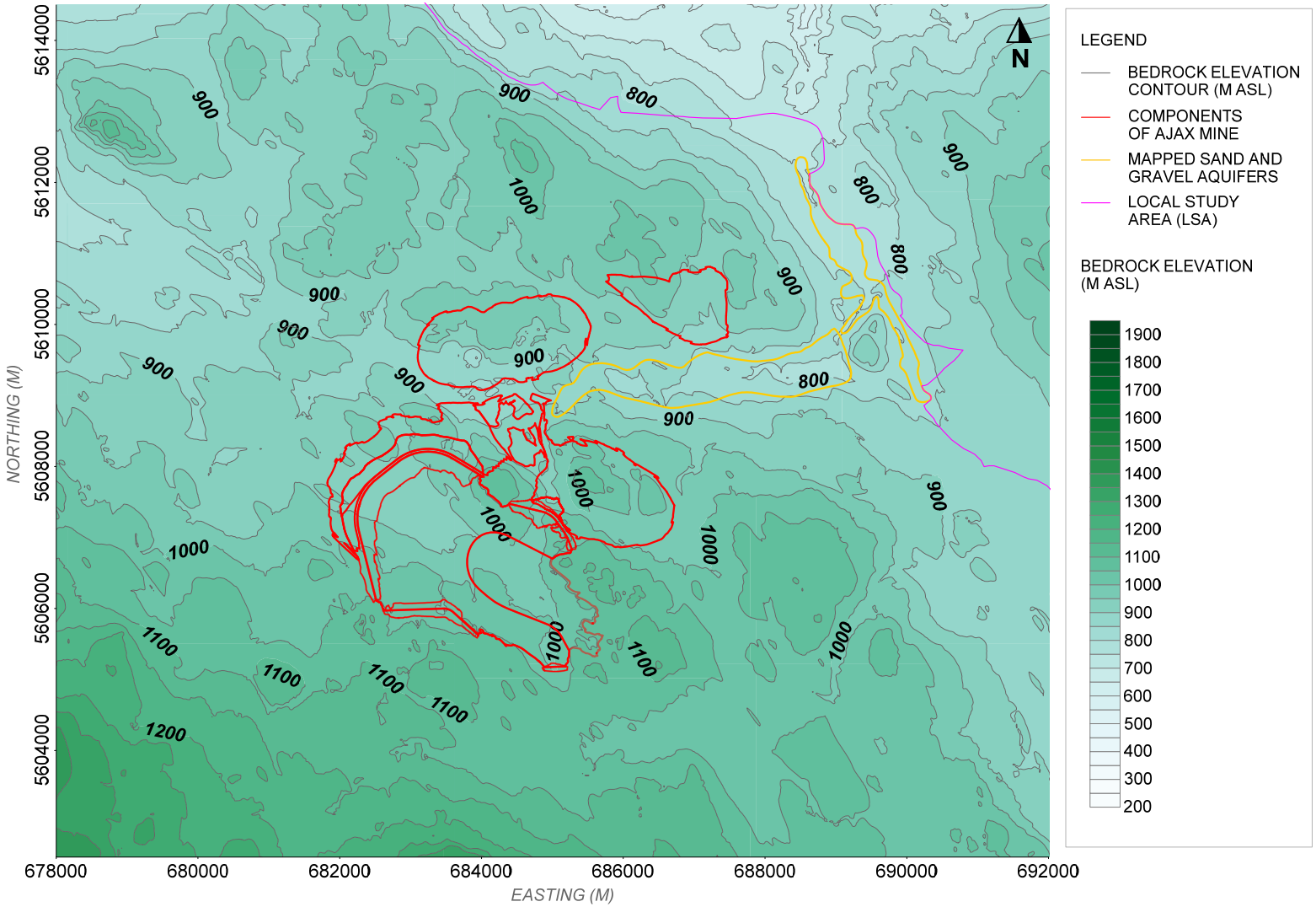


Figure 5. Interpreted Bedrock Elevation within the LSA.

Notes:

1. Bedrock elevation contours generated by Kriging with linear Z transform at a 25m x 25 m grid spacing using depth to bedrock data from borehole logs.

5.2.2. Stratigraphy of deposits within Peterson Creek Valley

5.2.2.1. Regional Study Area

Three stratigraphic units identified in the literature that are thought to be comparable to those mapped in the Peterson Creek valley were logged in a section that is located approximately 2 km west Kamloops and north of the LSA [Armstrong and Fulton, 1965; Fulton, 1967; Fulton and Smith, 1978]. From oldest to youngest, these include:

- Okanagan Centre Drift
- Bessette Sediments
- Kamloops Lake Drift.

The reference or type section for the entire sequence is shown below on Figure 6 and the following descriptions are taken from Fulton and Smith [1978].

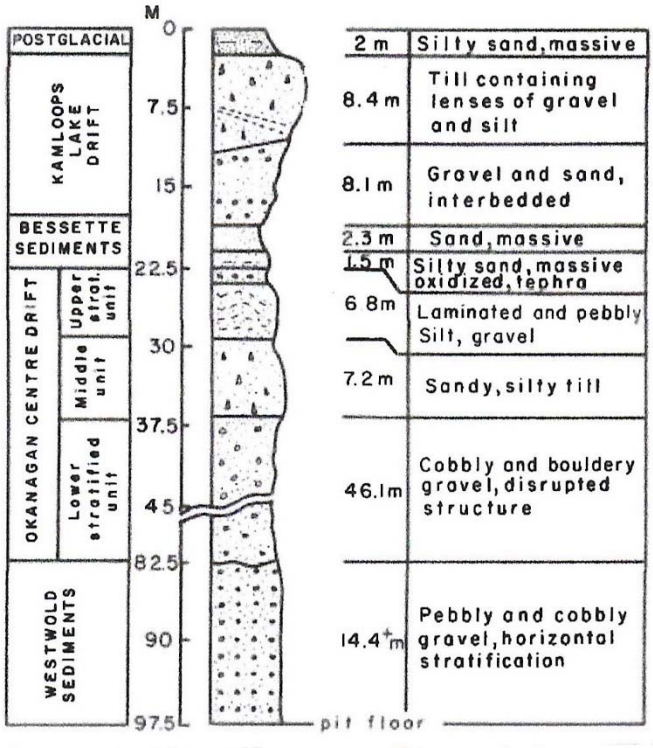


Figure 6. Type Section for Sediment in the Peterson Creek Valley Area (Fulton and Smith, 1978).

The Okanagan Centre Drift may be up to 60 m thick and is considered as outwash [Fulton and Smith, 1978]. From base to top, this succession consists of:

- Cobbles, boulders and gravel
- Sandy/silty till (diamicton)
- Laminated and pebbly silt and gravel.

The lower unit consists of sand and gravel and is often truncated, which suggests that the material may not be laterally extensive and that the grain size could change considerably over short distances. The till or diamicton that overlies the gravel is described as silty with a high sand and gravel content and stratified in parts. The work of Fulton and Smith [1978] suggests that the sand and gravel within the diamicton resulted from the entrainment of the underlying sand and gravel. This material is considered to have been deposited as a combination of outwash (i.e., subaerially and/or subaqueously) till and then glaciolacustrine silts and sand. Capping the Okanagan Centre Drift is a laminated and pebbly silt and/or possibly gravel. The laminated silt within this sequence is interpreted as glaciolacustrine in origin.

The Bessette sediments overlie the Okanagan Centre drift. The fine to silty sand materials were thought to be interglacial due to the presence of volcanic ash and plant remains. These sediments are typically less than 4 m thick and have been mapped at depth along Peterson Creek, north of the Mine Site [Armstrong and Fulton, 1965].

The Kamloops Lake Drift succession overlies the Bessette sediments, and consists of three sub-units, which include:

- A lower unit of stratified silt sand and gravel (up to 45 m thick)
- A middle unstratified unit of till (typical thickness of 1 to 5 m but is up to 15 m thick)
- An upper unit of stratified silt, sand and gravel (rarely more than 4.5 m thick).

A detailed type section for this succession is shown in Figure 7.

The lower sub-unit consists of rhythmically bedded silt and clay and cross-laminated fine sand to poorly stratified pebbly sand, boulders and gravel. It is generally overlain by till (unstratified Kamloops Lake Drift); although in some places it is found at the surface. For example, it is exposed in areas southwest of Kamloops, near Cherry Creek, on Peterson Creek and at Kamloops Lake. In Peterson Creek, the lower sub-unit consists of 23 m of boulders and gravel that contains matrix-supported bimodal gravel that was deposited as outwash, deltas or fans, into the lake that existed in the Peterson Creek Valley [Fulton and Smith, 1978].

The middle, unstratified till sub-unit of the Kamloops Lake Drift generally has a silty sand matrix with pebbles and cobbles that are usually the same lithology as the underlying sediment or bedrock [Fulton and Smith, 1978].

Stratified silt, sand and gravel, comprise the upper unit of the Kamloops Lake Drift. The unit is considered to be predominantly glaciolacustrine in origin and was deposited during the final deglaciation of the area. The depositional environments likely included glacial lakes that occupied topographic depressions and the Peterson Creek valley as the ice retreated. The sand and gravel in this sub-unit likely accumulated as glacial outwash, as well as ice contact deposits, within spillways between glacial lakes [Fulton and Smith, 1978].

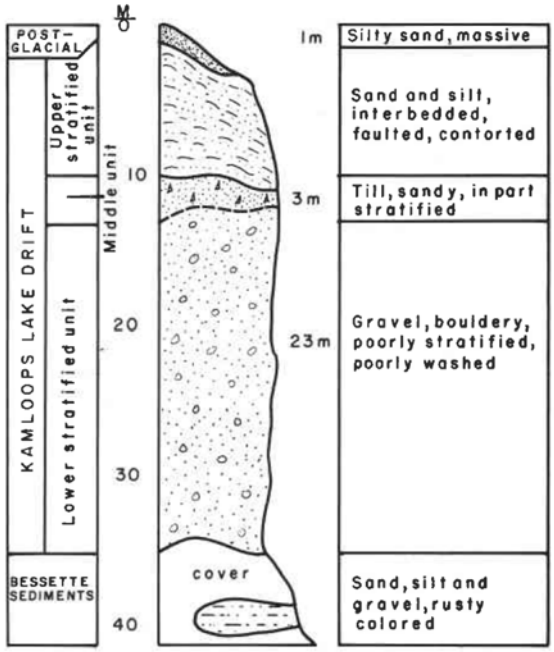


Figure 7. Section exposing Kamloops Lake Drift, on Peterson Creek near Kamloops [Fulton and Smith, 1978].

5.2.2.2. Local Study Area

The type sections discussed in Section 5.2.2.1 are located just south of Kamloops within the Peterson Creek valley [Armstrong and Fulton, 1965]. Interpretation of stereo aerial photograph pairs [National Air Photo Library (Ottawa), 1964; 1971] by BGC staff suggests that these deposits may extend laterally through the Mine Site along the Peterson Creek valley to Jacko Lake (Appendix K). The sediment intercepted and described in some Ajax boreholes within and near to the mapped Peterson Creek Aquifer[5] may be of similar age to these type sections.

The stratigraphy of surficial deposits identified in several boreholes drilled around Peterson Creek and Jacko Lake are similar to the type sections described by Armstrong and Fulton [1965] in terms of both stratigraphic sequence and thickness (Appendix A and B). The 80 m-thick succession of poorly graded gravels overlain by silty gravel, clay and silt encountered in BGC14-PW01 and potentially MW11-10D are similar to the type section described for the Okanagan Centre Drift. This poorly-graded material is interpreted as diamicton that was likely deposited as glaciofluvial debris flows or due to ice collapse. The sediment encountered at nearby BGC14-018, from base to top, consist of silty sand units with trace gravel at the base of the borehole, overlain by layers of alternating silt and sand units and capped with silty gravel, similar to the mid and upper units within the Okanagan Centre Drift. The lack of direct lateral correlation between sand and silt of BGC14-PW01 and BGC14-018 despite the proximity of the two holes (i.e., approximately 10 m) is consistent with the “disrupted structure” or truncation typical of basal sands and gravels of the Okanagan Centre Drift [Fulton and Smith, 1978]. This

[5] BGH13-021, BGC13-022, BGC14-004, BGC14-005, BGC14-PW01, BGC14-018 and MW11-10D/S.

suggests that, although the complex itself may be laterally continuous within the Peterson Creek valley, glacial processes such as meltwater scour and fill may have truncated and subsequently filled the scours with different materials at depth.

This type stratigraphy, in addition to the surficial mapping (Drawing 07) and material classifications (Table 6) discussed previously, was considered when interpreting and correlating material described in the site drilling data to create the hydrogeologic cross sections for the Peterson Creek portion of the Mine Site (Drawings 08A through 08E). From the cross section interpretations, some key characteristics of these deposits near the Mine Site are as follows:

- Coarse, cobbley gravels interpreted as glaciofluvial in origin are often encountered at the bases of the thickest identified sequences within bedrock troughs that may extend from Jacko Lake to the limit of the mapped Peterson Creek Aquifer (Drawing 08A to 08E).
- Basal gravel units appear to be discontinuous over relatively small (i.e., 10 m) lateral distances, separated by poorly sorted sand, silt and clay (diamicton) (i.e, Drawing 08A and 08E, near BGC14-PW01).
- Basal gravel units are often overlain or truncated by poorly sorted sands, silts and clays (interpreted as glacolacustrine complexes including diamicton).
- Silt and clay deposits interpreted as glaciolacustrine in origin form isolated lenses within the larger glaciofluvial sand complexes (Drawing 08A to 08E).

The above descriptions show that the deposits within the Peterson Creek valley change considerably both laterally and horizontally over short distances. The hydrostratigraphy or hydrogeological characteristics of the deposit reflects this complexity. This is discussed further in Section 7.1. The general depositional model that would result in deposits is discussed in Section 5.2.3.

5.2.3. Valley Depositional Model

5.2.3.1. Regional Study Area

The Cordilleran Ice Sheet that covered the RSA decayed by regional stagnation and resulted in the formation of ribbon-shaped glacial lakes that dissected the valleys of the Interior Plateaus of BC ([Fulton, 1967], Johnsen and Brennand [2004] and references therein). Valleys were considered to act as conduits and basins for water flow and sediment deposition from adjacent highlands. Stagnant ice masses that were separated from the active glacier were left in the valleys. These blocks of ice dammed and created glacial lakes. These lakes enlarged as the glacier retreated northwest from the Mine Site. Drainage in the Kamloops area is thought to have been controlled by ice blocking the main valleys in the mountains after most of the Interior Plateau was free of ice [Fulton, 1967]. Catastrophic drainage of water from glacial lakes resulted from ice-dam failures as stagnant ice melted. These events are thought to have resulted in a regional reversal in flow direction of the Thompson and South Thompson Rivers

and the capture of the Thompson Basin by the Fraser River system (Johnsen and Brennand [2004] and references therein).

Following the regional drainage reversal, the water level in Kamloops Lake progressively lowered and the Thompson River incised approximately 150 m into existing valley fill that consisted of glaciolacustrine silts and fine sands. This incision created fluvial terraces composed of sand and gravel. Subsequently, isostatic rebound caused the former glacial shoreline to tilt approximately 0.5 to 1 m/km (Johnsen and Brennand [2004] and references therein).

5.2.3.2. Local Study Area

The ice retreat sequence for the LSA discussed by Fulton [1967] describes the processes that may have led to the distribution of sediment currently mapped in the LSA. Based on this geologic conceptual model, sediments mapped as glaciofluvial deposits in the LSA may have accumulated in either of the following two sedimentary environments:

1. Proglacial and possibly subglacial glaciofluvial and glaciolacustrine deposition and erosion within valleys and basins that were occupied by active and/or stagnating glacier ice and ice dammed lakes.
2. Deposition from deltas or fans by meltwater discharging from deglaciated uplands into ice-dammed lakes within valleys and basins.

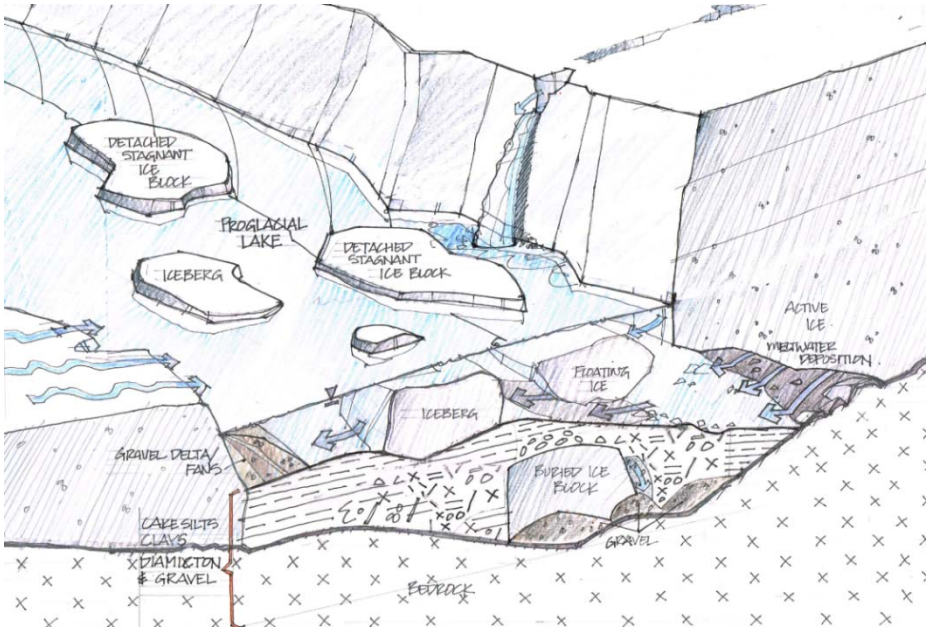
The general sedimentary environment and associated facies packages for the above settings are illustrated in Figure 8a.

In sedimentary environment 1, meltwater discharging from the active ice sheet located north-west of Peterson Creek would have flowed into and through the Peterson Creek valley. A proglacial lake is thought to have formed in the valley due to an ice dam northeast of the study area. Blocks of glacier ice that had previously detached from the active glacier were stagnating in the valley and Proglacial Lake. Meltwater discharging into the valley would have flowed beneath stagnating ice in bedrock troughs and around and overtop of the ice blocks as they melted (Figure 8a).

In sedimentary environment 2, a proglacial lake similar to that described for environment 1 would have existed in the valley. However, deposition in this setting would have been controlled by deltas or fans as flow expanded from adjacent uplands and emerged in the valleys, depositing sediment on top of stagnated ice (Figure 8b).

Subsequent ice melting would have resulted in a sequence of poorly sorted, partially re-worked diamicton or tills below fan deposits and above gravel-filled troughs, as illustrated in Figures 8a and 8b. This succession is consistent with sedimentary facies that have been identified in the Peterson Creek valley and in drill holes near the Mine Site (i.e., BGH13-021, BGC13-022, BGC14-PW01, BGC14-004, BGC14-005, BGC14-018 and MW11-10D/S).

(a)



(b)

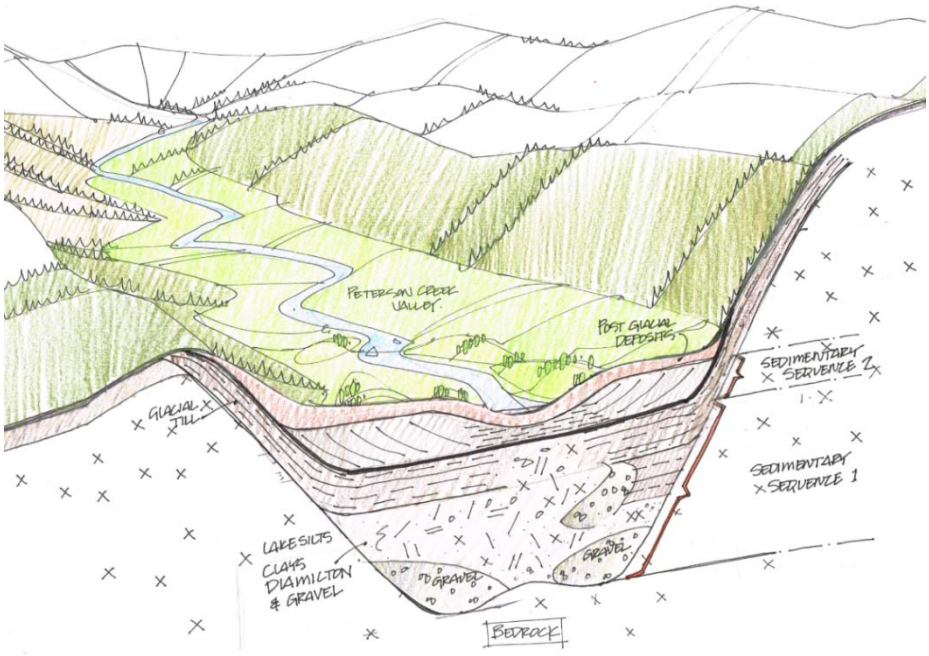


Figure 8. Conceptual Depositional Model for Surficial Materials within the Peterson Creek Valley.

The shapes and positions of isolated ice blocks that occupied topographic depressions near the Mine Site were interpreted by Fulton [1967] to coincide with areas mapped as kettle terrace deposits and/or rill complexes by the Geological Survey of Canada (GSC), as shown on Figure 9. These areas include:

- Jacko Lake
- The area mapped by the BC MOEMOE as the Peterson and Davidson Creek Aquifers
- The topographic low between Jacko Lake and mapped Peterson Creek Aquifer
- The Goose Lake/TSF area
- The Edith Lake/Anderson Creek area.

The above locations coincide with detailed mapping of glaciofluvial deposits by KP and Keystone near the Mine Site (Drawing 07), with the exception of kettle/terrace deposits and rill complexes mapped by the GSC in the Edith Lake/Anderson Creek area (Figure 9). These areas are outside of the limit of detailed mapping completed for the Ajax Project. The above locations also coincide with the interpreted limits of glaciofluvial sediments from aerial photography near the Mine Site (Appendix K).

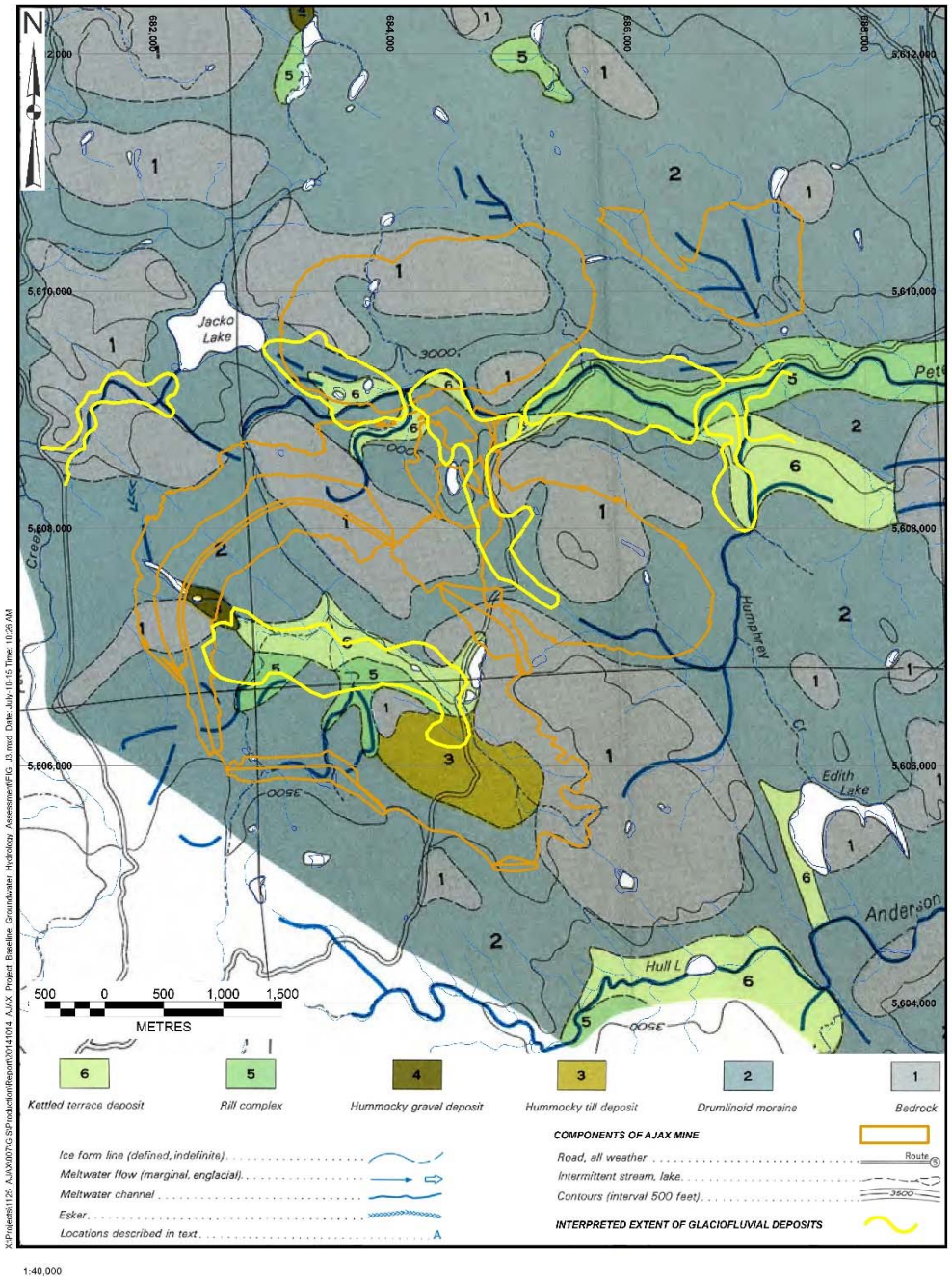


Figure 9. Interpreted Extent of Glaciofluvial Deposits near the Mine Site.

Notes:

1. Kettle terrace deposits and/or rill complexes mapped by the Geological Survey of Canada (GSC) represent approximate locations of isolated ice blocks that occupied topographic depressions near the Mine Site (Fulton, 1967).
2. Limits of glaciofluvial sediments interpreted from aerial photography in Appendix K.

5.3. Structure

5.3.1. Regional Study Area

Geological structures within the RSA include major faults within the Nicola Group volcanics and the Iron Mask Batholith; some of which follow regional northwest and southeast trends. Other faults observed within the RSA may be related to the contacts between individual geological units. As noted in Section 3.1.1, a review of regional structural geology was completed by Dr. K. V. Campbell as part of the FS for the Ajax project. The major faults and fault sets identified in that study are summarized below and are shown on Drawing 04[6].

The most common faults observed in the mapping completed to date [Kwong, 1987; Logan and Mihalynuk, 2005; Massey et al., 2005] are northwest (300° to 330°) striking. These features may be major basement faults of the Nicola Group that were active in the mid-Triassic. Therefore, the major faults of the country rock have influenced the distribution of the volcanic and sedimentary rocks of the Nicola Group, as well as the intrusive rocks of the Iron Mask Batholith. Younger faults may control the distribution of later dykes in the Iron Mask Hybrid and Sugarloaf diorite units (i.e., active during the Eocene).

The Eocene rocks of the Kamloops Group (i.e., near New Afton and Aberdeen) are intensely faulted and change lithologies over short distances [Kwong, 1987]. Faults along Cherry Creek were interpreted to be active during deposition of these rocks, and through the New Afton Mine (Golder 2008a and references therein). Northwest/southeast and east/west structures could have controlled basin geometry (Golder 2008a and references therein). In the New Afton Mine area, a thick sequence of Kamloops group rocks separate the Iron Mask and the Cherry Creek plutons in what has been interpreted as a graben structure, which resulted from renewed fault movement around the margins of the plutons during Paleocene or Early Eocene time [Kwong, 1987].

Additional fault systems have been mapped in detail within the bedrock underlying the Aberdeen area within the RSA, just north of the LSA [*Golder*, 2008c]. These include a west-northwest to east-southeast oriented set of strike faults and a north to northeast striking set of cross faults (Drawings 04 and 05). The former set of faults is post-depositional to the latter.

5.3.2. Local Study Area

Major faults in the Nicola Group and Iron Mask Batholith discussed above also occur within the LSA; some of which follow the major regional northwest and southeast trends. Other faults observed may be related to the contacts between individual geological units. Faulted contacts within the units of the Iron Mask Batholith and between the Iron Mask Batholith and Nicola

[6] Faults shown on Drawing 04 only extend to the ground surface at bedrock outcrops and are otherwise covered by Quaternary deposits.

Group appear to represent the most important large scale geological structures associated with the intrusive rocks of the study area.

The Cherry Creek tectonic zone, approximately 2 km southwest of the Ajax property (Drawing 05), is representative of this trend. The Edith Lake Thrust Fault (ELTF), a northeasterly dipping thrust fault interpreted by Logan and Mihalynuk [2006] and approximately 1 km southwest of the planned open pit (Drawing 05), may be associated with this trend. It is important to note that there is no discussion of the ELTF in Logan and Milalynuk's paper. None of the references to their compilation make any mention or identify such a structure. Work completed by Dr. Vin Campbell [2014] suggests that a zone of faulting is present that is roughly coincident with the ELTF alignment, as well as along a north-south trend near Jacko Lake (Drawing 03).

Preliminary drilling results from KP and KGHM reviewed as a part of Dr. Campbell's work indicate that faulting occurs on both sides of the fault trace. This implies that there is a zone of faulting or a number of steep faults dipping to the northeast around the interpreted fault trace. The term 'fault zone' (i.e. the Edith Lake Fault Zone or 'ELFZ') is used instead of the term 'thrust' in this assessment. The results from field investigations that were completed concurrently with the preparation of this report have confirmed the presence of a zone of faulted bedrock in the vicinity of the feature interpreted by Logan and Mihalynuk [2006]. Three potential interpretations with respect to geologic structure were presented as a result of the drilling program:

1. The ELFZ may represent a fault with a surface trace consistent with the feature interpreted by Logan and Mihalynuk [2006] and shown on Drawing 03, with a dip and dip direction of 83°/039°(i.e., striking N51°W and dipping 83° from the horizontal). The potential thickness of the fault zone in this interpretation is approximately 5m.
2. The ELFZ may represent a zone of faulting that is roughly parallel with the inclined holes drilled in the investigation. Structural features in this interpretation have a dip and dip direction of 62°/208° (i.e., striking S62°E and dipping 62° from the horizontal). The interpreted width of the fault zone in this scenario is approximately 4m.
3. The ELFZ in Interpretation 1 marks the north eastern extent of a larger fault zones which encompasses the zone encountered in the investigation borehole. In this interpretation, the ELFZ is near vertical with an estimated thickness of 50-60m.

The investigations around the ELFZ and results are discussed in detail in BGC [2015b]; hydraulic conductivity rest results from this study are discussed in Sections 7.1 and 7.2.

The East Pit Fault (Drawing 05) mapped within the open pit area also has a similar trend to the regional fault set, thus this appears to be the dominant fabric through the study area. Other sets include: inferred normal faults striking approximately north-south (350° - 005°) that are observed to truncate faults of the northwest-trending set, generally northeast striking faults interpreted to be post intrusion of the Iron Mask Batholith, and generally east-west striking

faults inferred from aeromagnetic linear features and the faulted contacts between the geotechnical units defined in the pit area.

Faults exposed in the Ajax West Pits and the Ajax East Pit have been mapped by AME as well as by Ross [1993] (Drawing 05). These faults are generally sympathetic to the faulted unit contacts and represent intermediate to major structures of the rock mass. Faults have served as the focus of mineralization, veining and alteration events near the Mine Site. Fault infill is variable, including barren and mineralized faults, gouge infilled faults, and vein healed faults.

The faulted contact of the Sugarloaf Diorite (SLD) and Iron Mask Hybrid (IMH) units is exposed in the Ajax West Pits and the Ajax East Pit (Drawing 05). This fault dips steeply to the south and strikes east in the Ajax West Pits; this fault strikes northeast in the Ajax East Pit. The contacts of the SLD and Nicola Group are also interpreted to be faulted. However, this is not well exposed in the existing pits.

The rocks of the Nicola Group, SLD and IMH in the pit area were divided into separate geotechnical units based on previous investigations [*BGC*, 2011b]. The geotechnical characterization of these units was as follows:

- The rocks of the Nicola Group unit are typically moderately strong to strong; with weaker rock observed in the highly serpentinized zones. The rock mass of the Nicola Group unit was characterized by a “poor” rock quality designation (RQD) and closely spaced discontinuities.
- The IMH diorite rocks are strong to very strong. The rock mass of the IMH unit was characterized by “good” RQD with closely to moderately spaced discontinuities.
- The rocks of the SLD unit are strong to very strong. The rock mass of the SLD unit was characterized by “fair” RQD with closely spaced discontinuities.

Further detail on geotechnical assessments of bedrock in the pit area are described in the Project Feasibility Study technical report [*Wardrop*, 2012].

5.4. Alteration

5.4.1. Regional Study Area

The interlayered tuffs, breccias, flows, and flow breccias of the Nicola Group are typically well indurated and weakly metamorphosed (greenschist facies), resulting in a green-grey colour for the Nicola volcanics (uTrN) near the Mine Site.

Alterations noted in the intrusive rocks include propylitic, albitic, potassic and scapolitic assemblages. The intensity of the propylitic alteration varies throughout the Iron Mask Hybrid. Epidote alteration occurs in the groundmass and as veinlets in the Sugarloaf diorite. Albitic alteration has been related to copper and gold mineralization of the deposit. Albitization is best developed in the Sugarloaf diorite, especially at the faulted contact with the Iron Mask Hybrid. Potassic alteration is marked mainly by veins of potassium feldspar. Scapolite alteration occurs in several areas as stockwork within the Iron Mask Hybrid.

The Eocene Tranquille sediments and tuffs of the Kamloops Group have undergone regional metamorphism, which produced zeolite facies [Owsiacki, 2003]. A significant resource of sodium bentonite (smectite-montmorillonite) has been discovered within a particular sequence of mudstone, sandstone and tuffs within this formation. As noted in Section 5.2.1.1, significant alteration occurs at the contact of the Kamloops Group and Quaternary tills in the Aberdeen area. This alteration has resulted in the development of swelling clays (montmorillonite and bentonite) inferred to be responsible for slope stability concerns in the subdivision. Planes of movement usually occur in the swelling clays along the interface between the Kamloops Group formation and overlying Quaternary units [*Golder*, 2008c]. A number of risk evaluation and control measures to mitigate ground instability issues in the Aberdeen area have been implemented by the City and are discussed in City of Kamloops [2008].

5.4.2. Local Study Area

Multiple stages and zones of alteration have been noted in the LSA. Serpentinization and hornfelsing of the country rocks has occurred locally with emplacement of the Iron Mask Batholith. Of potential importance is the picrite unit (uTrNop), possibly basalt [Snyder and Russell, 1994], which occurs as discrete serpentinized sections within the LSA (Drawing 05). When highly serpentinized, the picrite unit is weaker and more altered than the associated rocks of the Nicola Group. Serpentinization of the picrite within the Batholith is through-going, while windows of hornfelsed Nicola Group volcanics occur along the faulted contact with the Sugarloaf diorite. Minor silica alteration present in the existing Ajax Pits is related spatially to the post-porphyry mineralization dykes.

6.0 GROUNDWATER RESOURCE USE AND CLASSIFICATION

The BC MOE indicates that a hydrogeology study to support an EA Application for a resource development project should identify the extent, use and potential of groundwater resources in and around the proposed development [*BC MOE*, 2013b]. As such, a discussion of mapped aquifers and registered water users within the RSA as documented in BCMOE [2014] is provided in this section. A summary of aquifers mapped by the BC MOE within the RSA is provided in Table 7.

The BC MOE has developed a map-based aquifer classification system to support the management of groundwater resources in the province. Aquifers have been classified on the basis of their level of development and vulnerability to contamination. The system also provides ranking values for aquifers based on hydrogeologic and water use criteria to indicate the relative importance of an aquifer.

An aquifer's class is determined based on the combination of three development and three vulnerability subclasses. The development subclass (I, II or III) refers to the level of development of an aquifer determined by assessing demand verses the aquifer's yield or productivity. A high (I), moderate (II), or low (III) level of development may be designated. The vulnerability subclass (A, B or C) refers to the vulnerability of an aquifer to contamination from surface sources assessed based on type, thickness and extent of geologic materials overlying the aquifer, depth to water (or top of confined aquifers), and the type of aquifer materials. A high (A), moderate (B), or low (C) vulnerability may be designated.

An aquifer's ranking value is a numerical measure of its priority, determined by summing point values assigned based on productivity, size, vulnerability, demand, type of use, quality concerns (that have health risk implications), and quantity concerns.

The classification system was developed in part to support the MOE Water Management Program's direction toward groundwater allocation, planning and protection. A description of aquifer classification (i.e. by development and vulnerability) and ranking components is provided in Appendix L for reference. The classification system is described in detail by Kreye et. al [2013].

Identification and delineation of aquifers and their boundaries are primary tasks of classification. As the current system relies on existing information, only aquifers which have sufficient groundwater development have been delineated and classified. In cases where aquifers could not be fully delineated, especially confined unconsolidated aquifers and bedrock aquifers, the MOE defined aquifer boundaries by the area of groundwater development. Aquifer boundaries within the inventory therefore range from reasonable assessments (where detailed information is available) to general approximations (scarce information availability). In general, aquifers with areas less than 1 km^2 have not been mapped. The current inventory of delineated aquifers is available as a spatial dataset for download from the MOE's WRBC database [*BC MOE*, 2014]. Most aquifer boundaries within the dataset have been delineated based on the available geologic, hydrologic and topographic information. Due to resource or

data constraints at the time of mapping, some boundaries within the dataset border mapsheet boundaries.

The following sections summarize the classification and rank of mapped groundwater resources within the RSA and LSA, as well as the documented groundwater wells that have been drilled, dug or driven within these resources [*BC MOE*, 2014]. Mapped aquifers and wells within the study areas are shown on Drawing 02.

6.1. Regional Study Area

Identification, classification and ranking details for aquifers delineated within the RSA are summarized in Table 7. As shown on Drawing 02, there are a total of 13 mapped aquifers within the RSA. Eight aquifers (including the Peterson and Davidson Creek Aquifers) consist of sand and gravel mixtures. The remaining five aquifers are comprised of bedrock.

Figure 10 shows the distribution of mapped aquifers identified within the RSA according to class.

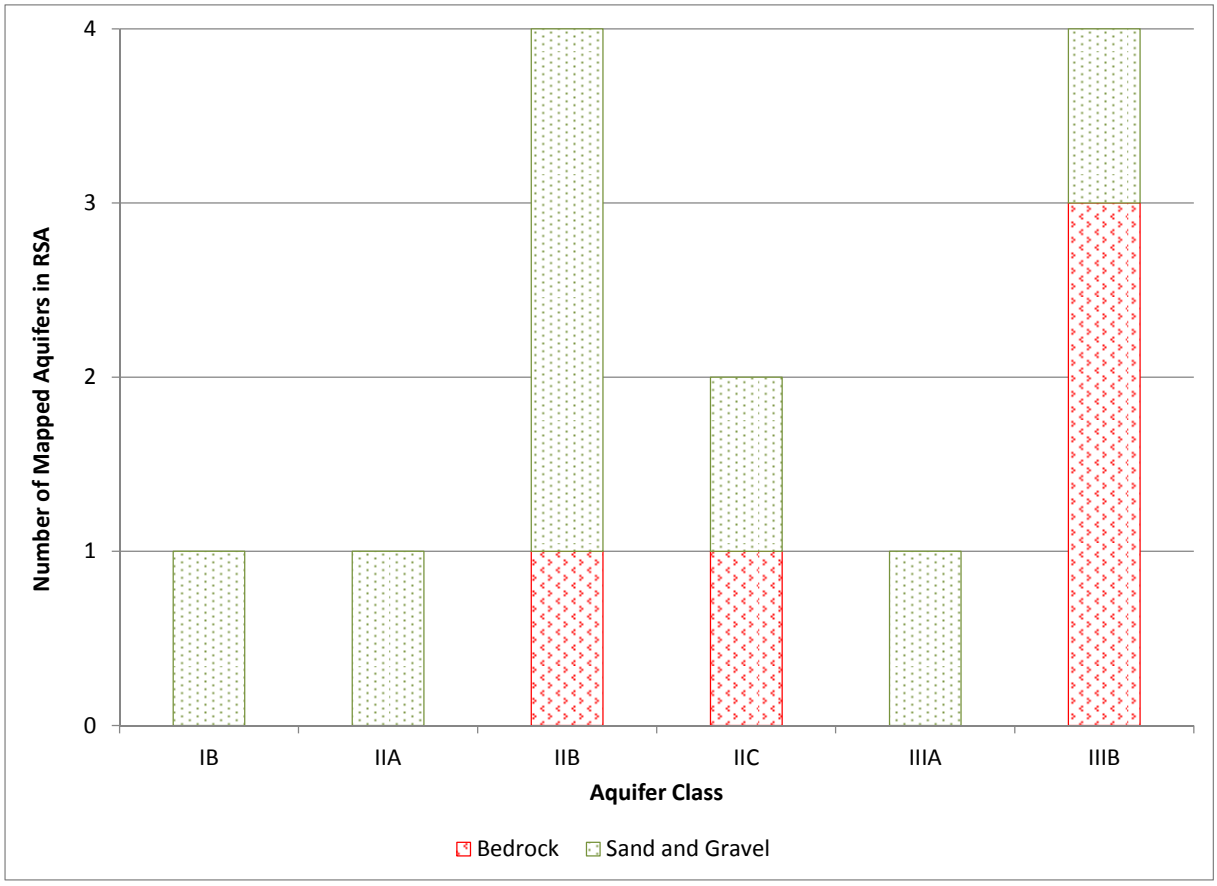


Figure 10. Distribution of Mapped Aquifers in the RSA according to Class.

Notes:

1. See Appendix L for description of BC MOE Classification system.

The WRBC database has recorded that there are 495 registered wells within the RSA. Lithology, estimated well yield based on airlift tests and well use are specified in some of the well records.

Of the 495 registered wells within the RSA, 333 (approximately 70%) are reported to be completed within bedrock deposits. One-hundred and ninety-eight (198) of these wells report yields of less than 1L/s; 34 wells report yields between 1 to 5 L/s; 4 wells report yields between 6 to 10 L/s; 1 well reports a yield between 10 to 15 L/s and 3 wells report yields between 15 to 18.9 L/s. Ninety-three (93) wells reported to be completed within bedrock do not report well yield.

Of the remaining wells, 47 (approximately 10%) are reported to be completed in unconsolidated materials and 115 (approximately 20%) do not report aquifer lithology. The wells reported to be completed in unconsolidated material were classified according to potential yield; 12 wells with yields less than 1 L/s; 19 wells with yields between 1 to 5 L/s; 7 wells with yields between 5 to 10 L/s; and 1 well with a yield of 20.5 L/s. Eight (8) wells reported to be completed within unconsolidated materials do not report well yield.

The database search results indicate that wells are used for private domestic (267 wells or 54%), commercial and industrial (6 wells or about 1%), irrigation (6 wells or about 1%) water supply system (3 wells or about 0.6%) and observation (1 well or about 0.2%) purposes. Well use for 209 wells (about 42%) is documented as unknown, and 4 wells (about 1%) within the RSA have been abandoned. Registered wells interpreted to be completed in each aquifer within the RSA are summarized according to well use in Table 7. Usage is identified for individual wells in Appendix E.

The Cherry Creek Valley sand and gravel Aquifer (No. 0728) is the only aquifer in the RSA that is classified as highly developed (i.e. Sub-class I, where demand is high relative to productivity). This aquifer has also been classified as only moderately vulnerable to contamination from surface water sources (Sub-class B), and potentially supplies water for domestic use to 37 registered water wells (Table 7 and Appendix E).

A total of 7 moderately developed aquifers are mapped within the RSA. These include one IIA, four IIB and two IIC aquifers. Two of these aquifers (one IIB and one IIC class) are bedrock, whereas the others are mapped as sand and gravel. The remaining 5 aquifers within the RSA are classified as lightly developed, with one IIIA sand and gravel aquifer, one IIIB sand and gravel aquifer and three IIB bedrock aquifers.

6.2. Local Study Area

Five (5) of the aquifers noted in Section 6.1 fall within the LSA. These include the Sugarloaf Hill (No. 0276) and Knutsford (No. 0275) bedrock Aquifers, part of the Brigade Lake (No. 0274) bedrock Aquifer, and the Davidson Creek (No. 0277) and Peterson Creek (No. 0278) sand and gravel Aquifers. Of these aquifers, the Davidson Creek and Knutsford Aquifers are classified

as moderately developed, while the Peterson Creek, Sugarloaf Hill and Brigade Lake Aquifers are classified as lightly developed.

The Sugarloaf Hill bedrock Aquifer is generally located within the Iron Mask Batholith rock type and covers approximately 65km^2 in the northern part of the LSA. It is classified as lightly developed with moderate vulnerability and low productivity (Class IIIB). There are a total of 16 WRBC registered water wells within this aquifer. Six (6) of these wells are used for domestic purposes, 2 are used for commercial or industrial purposes, 1 is used for observation purposes and one well has been abandoned. Usage for the 6 remaining wells in this aquifer is unknown (Table 7). Recorded well yield estimates were typically less than 1 L/s (Appendix E).

The Knutsford bedrock Aquifer is located near the eastern border of the LSA and is directly below the Davidson Creek sand and gravel Aquifer, in the Knutsford development area. The aquifer is classified as moderately developed and with low vulnerability and low productivity (Class IIC). A total of 12 registered water wells are located within this 1km^2 aquifer, 10 of which are used for domestic purposes. Usage for the remaining 2 wells within this aquifer is unknown (Table 7). Recorded well yield estimates within this aquifer range from less than 1 L/s to approximately 4 L/s (Appendix E).

The Brigade Lake bedrock Aquifer is located partially within the LSA, near the southern limit of the boundary and south of Anderson Creek (Drawing 02). The aquifer is classified as lightly developed and with moderate vulnerability and low productivity (Class IIIB). A total of 9 registered water wells are located within this aquifer, 8 of which are used for domestic purposes. Usage for the remaining well within this aquifer is unknown (Table 7). Recorded yield estimates for wells interpreted to be completed within this aquifer range from less than 1 L/s to approximately 1.6 L/s (Appendix E).

The Davidson Creek Aquifer generally consists of sand and gravel deposits around Davidson Brook, to the east of the LSA and above the Knutsford bedrock aquifer. The aquifer is classified as moderate demand, moderate vulnerability and moderate productivity (Class IIB). A total of 10 registered water wells were drilled in this aquifer, 8 of which are used for domestic purposes. Usage for the remaining 2 wells within this aquifer is unknown (Table 7). Well yields recorded in these wells were less than 1 L/s (Appendix E).

The Peterson Creek Aquifer is a 2 km^2 sand and gravel aquifer located south of the project site along Peterson Creek. The aquifer is classified as low development, high vulnerability and moderate productivity (Class IIIA). There are a total of 7 wells interpreted to be completed within the aquifer, 6 of which are used for domestic purposes. Usage for the remaining well within this aquifer is unknown (Table 7). Estimated yields in wells interpreted to be completed in this aquifer were all recorded at less than 2 L/s by the WRBC (Appendix E).

7.0 PHYSICAL HYDROGEOLOGIC SETTING

7.1. Hydrostratigraphic Units (RSA and LSA)

The formations encountered within the RSA have been divided into 13 principal hydrostratigraphic units for the purpose of this assessment. Eight (8) of these units include Quaternary or recent surficial deposits, and the remaining 5 units are bedrock. The division of units is based on the geologic assemblage from the available mapping, KAM's 3D geologic model, borehole and test pit and hydraulic conductivity testing data, as well as the geologic depositional model discussed in Section 5.0. Hydrostratigraphic units may be comprised of multiple lithologies which are expected to behave in a similar manner with respect to groundwater movement at a large scale.

7.1.1. Surficial Deposits

The eight Quaternary or recent surficial hydrostratigraphic units consist of the following material assemblages:

1. Fluvial and Glaciofluvial sands and gravels.
2. Glacial till, diamicton and undivided glacial material.
3. Lacustrine and glaciolacustrine deposits and undivided recent lake sediments.
4. Mine rock and anthropogenic materials.
5. Eolian deposits.
6. Colluvium.
7. Organic materials.
8. Bedded Gypsum.

7.1.1.1. Fluvial / Glaciofluvial Deposits

The fluvial/glaciofluvial hydrostratigraphic unit includes sand and gravel deposits that accumulated in valleys during the Fraser glaciation, as well as post-glacial sands and gravels mapped within the RSA and LSA. These materials comprise the terrace, kettle terrace, rill complex and hummocky gravels discussed in Section 5.2.1 that would have been deposited in proglacial and/or subglacial environments or meltwater deltas as discussed in Section 5.2.3.2. The key characteristics noted from cross section interpretations (discussed in Section 5.2.2.2) suggest that the deposits comprising the fluvial/glaciofluvial unit have the potential to form highly heterogeneous aquifer complexes with limited large-scale hydraulic connectivity of conductive units. Variable states of aquifer confinement throughout the complex would also be anticipated due to succession layering. The fluvial/glaciofluvial unit occurs in the areas mapped by the MOE as the Peterson and Davidson Creek Aquifers, the area extending from Jacko Lake to the Peterson Creek Aquifer, and within the Edith Lake, Anderson Creek and Goose Lake/ TSF areas mapped as fluvial/glaciofluvial by Keystone [2008] (Drawing 06). Modern alluvial-fan complex materials (i.e. post-glacial sediments in the Kamloops Lake/Thompson River and Campbell Creek areas) mapped within the RSA were also grouped with the fluvial/glaciofluvial hydrostratigraphic unit. The sand and gravel aquifers (No.s 0280,

0283, 0284, 0285, 0286 and 0728) are considered to be part of this group due to their mapped locations and generalized lithologic descriptions as belonging to glacial or modern alluvial depositional events (Drawing 02, Table 7).

7.1.1.2. Glacial Till Deposits

The glacial till hydrostratigraphic unit comprises the veneer of poorly sorted tills, diamicton and undifferentiated glacial deposits discussed in Section 5.2.1. This includes tills mapped in uplands that were likely deposited below melting or receding ice as well as poorly sorted, laterally discontinuous diamicton within valley deposits as described in Section 5.2.3.2. Materials logged within the LSA as till and/or poorly sorted surficial sediments within test pits and drill logs noted above were included in this group. These materials are not expected to transmit significant groundwater when compared to the glacial sediments deposited by fluvial processes.

7.1.1.3. Lacustrine / Glaciolacustrine Deposits

The lacustrine/glaciolacustrine hydrostratigraphic unit includes undifferentiated lacustrine deposits and areas mapped as recent lakebed sediments throughout the RSA discussed in Section 5.2.1. In the LSA and near the Mine Site, this unit includes areas with existing lakes and ponds and materials logged as silty sands and silts within available test pit and drill hole data. Sediments of glacial origin within this unit would have accumulated within a proglacial ice-dammed lake as described in Section 5.2.3.2; post-glacial deposits within this unit would have accumulated from more recent, low-energy lake environments. Similar to the glacial till hydrostratigraphic unit, these materials are not expected to transmit significant groundwater when compared to the glacial sediments deposited by fluvial processes.

7.1.1.4. Mine Rock / Anthropogenic Materials

The mine rock/anthropogenic hydrostratigraphic unit comprises areas mapped as “anthropogenic materials” by Keystone [2008] and discussed in Section 5.2.1.2. This unit includes materials logged as mine rock from previous mining activities in the Ajax and New Afton areas.

7.1.1.5. Colluvial, Eolian and Organic Materials

The information available to classify colluvial, eolian and organic hydrostratigraphic units is limited to textural descriptions and mapping by Keystone [2008]. Similarly, SI or WRBC drill data for the area of bedded gypsum referred to as “gypsum spring” by Golder [2008c] were not available for this assessment. However, these assemblages were classified as distinct hydrostratigraphic units based on their geologic descriptions within the literature and mapped distributions within the RSA. These units are considered in the companion numerical groundwater flow modelling study being completed for the Application/EIS [*BGC*, 2015d].

7.1.2. Bedrock

The 5 bedrock hydrostratigraphic units considered for this assessment consist of the following:

1. Nicola Group volcanics and sediments[7].
2. Picrite.
3. Iron Mask Hybrid.
4. Sugarloaf Diorite.
5. Kamloops Group volcanics and sediments.

7.1.2.1. Nicola Group

The Nicola Group hydrostratigraphic unit underlies the majority of the RSA and LSA. Nicola Group rocks are found on the south and southwest limits of the planned open pit, at depth in the floor of the ultimate pit, and on the upper east wall. Although the available test data are restricted to volcanics, this unit incorporates all rocks of the Nicola Group, including sedimentary facies to the north east, amphibolite facies to the south of the planned open pit (Drawing 04 and 05). The mapped Rose Hill / Barnhartvale / Shumway Lake bedrock Aquifer is included in this unit due to its mapped location and lithologic description (Table 7). The rocks of the Nicola volcanics unit in the pit area are typically moderately strong to strong [*Wardrop*, 2012].

7.1.2.2. Picrite

The Picrite hydrostratigraphic unit comprises serpentinized and unserpentinized picrite basalts described in Section 5.4.2. It is a distinct and poorly delineated unit within the Nicola Group volcanics. The mapped distribution of the Picrite unit is shown on Drawing 05. The 3D representation of this unit in the geologic model maintained by KAM has been considered in the companion numerical groundwater flow modelling study being completed for the Application/EIS [*BGC*, 2015d].

7.1.2.3. Iron Mask Hybrid

Rocks of the Iron Mask Hybrid hydrostratigraphic unit intrude the Nicola Group rocks, occurring as an elongated composite band that extends northwesterly across the RSA, and the northeast edge of the LSA. The Iron Mask Hybrid unit occurs in the northwest, north-central and northeast areas of the planned open pit. The unit includes the Cherry Creek, Pothook and Iron Mask Hybrid geologic units and also the Sugarloaf geologic unit outside of the immediate pit area. The mapped Sugarloaf Hill bedrock Aquifer (No. 0276) is included in this unit based on its lithologic description (Table 7). The Cherry Creek Valley bedrock Aquifer (No. 0727) has been included with this unit due to its name and mapped location (i.e., roughly below the Cherry

[7] It should be noted that the data available for the Nicola Group are limited to the volcanics; data was not available for the Nicola Group sediments.

Creek phase of the pluton); no lithologic description was included in the WRBC aquifer files (Table 7).

7.1.2.4. Sugarloaf Diorite

The Sugarloaf Diorite hydrostratigraphic unit is considered separate from the IMH unit in the immediate pit area only, as it has been extensively delineated by AME and has been characterized by hydraulic conductivity testing by BGC in this location. The Sugarloaf Diorite unit coincides with the SLD geological and geotechnical unit [*Wardrop*, 2012]. In general, the lower slopes of the planned Ajax open pit intersect the rocks of this unit.

7.1.2.5. Kamloops Group

The Kamloops Group hydrostratigraphic unit overlies the IMH and Nicola Group units in the northwest to north-central portion of the RSA. Minor packages of this unit occur in close proximity to the contact of the IMH and Nicola group rocks, near the northeastern boundary of the RSA. This hydrostratigraphic unit is comprised of all rock types, structures and alteration zones within the Kamloops Group, as the level of information currently available is not sufficient to differentiate between volcanic and sedimentary members. Golder [2008c] has suggested that the sub-horizontal deposition of the Kamloops Group rocks imparts a layered characteristic inferred to give it a macroscale anisotropy (i.e., differing vertical and horizontal hydraulic conductivity). They have also indicated that the Kamloops Group is distinct from the Nicola Group due to the presence of swelling clays which may serve to magnify the anisotropy within this unit.

The mapped Knutsford Aquifer (No. 0275) is included in the Kamloops Group hydrostratigraphic unit based on its lithologic description (Table 7). As previously noted, regional mapping indicates that the Kamloops Group rocks can reach up to 2km in thickness, although it can be as thin as 150 m in the Aberdeen area. The contact between Kamloops Group unit and underlying units is interpreted to dip towards the north.

7.1.3. Fault and Alteration Zones

Other features that may be of potential hydrogeologic significance include faults (both regional and in the pit area) and zones of alteration, including the alteration zone within the Kamloops group rocks as noted by the City [2008]. In addition, Golder [2008c] has suggested that two mapped faults in the Aberdeen area (i.e., the Hugh Allen and Versatile Faults, Drawing 04 and 05) are hydrologically significant, acting as a barrier to northward groundwater flow. Numerical modelling studies completed by Golder [2008c] required the Hugh Allen and Versatile Faults to be simulated with significantly lower hydraulic conductivities than adjacent rock types. Both of these faults are considered to be syndepositional with the country rock in this area (i.e., the Kamloops Group) and do not correspond with or truncate any mapped aquifers within the area. The eastern 650 m of the Hugh Allen Fault intersects with mapped bedrock aquifer No. 0273 (i.e., the Rose Hill / Barnhartvale / Shumway Lake Aquifer).

Hydraulic testing completed as part of recent investigations into the ELFZ have suggested that this feature may have implications for groundwater flow near the Mine Site. Results from packer tests show that hydraulic conductivity within the ELFZ can be locally up to at least two orders of magnitude greater than surrounding competent bedrock. This suggests that a local groundwater flow conduit along strike of the ELFZ may be present in the vicinity of Jacko Lake, where the drilling and testing were conducted (lateral extent of the ELFZ across the Mine Site is uncertain). This interpretation is supported by slight upward vertical hydraulic gradients (i.e., potential upward groundwater flow towards the fault) calculated from potentiometric data collected at VWPs installed around the zone of faulting [*BGC*, 2015b].

As discussed in Section 5.3.2 and BGC [2015b], several interpretations are plausible for the structural orientation and thickness of the ELFZ. Therefore, some uncertainty remains on the interpretation of the thickness, hydraulic properties and orientation (dip and dip direction) of ELFZ; however, in all cases the ELFZ is interpreted to have a dip that is near vertical.

7.2. Hydrogeologic Parameters

7.2.1. Hydraulic Conductivity

A summary of hydraulic conductivity estimates from data discussed in Section 3.1.4 is provided in Figure 11 according to each interpreted hydrostratigraphic unit. The geometric mean hydraulic conductivity for each interpreted unit has been calculated from SI data collected for the Ajax Project, the New Afton Mine and studies completed in Aberdeen for the purpose of providing a bulk hydraulic conductivity estimate for each unit. The first and third quartiles of values computed from SI data are also shown on Figure 11 for each hydrostratigraphic unit.

Figure 11 shows that there is considerable variation between estimates (i.e., between 3 and 6 orders of magnitude) for each unit within the compiled data sets. The distribution of data shown in Figure 11 indicates that, within surficial deposits, fluvial/glaciofluvial deposits and mine rock are generally the most conductive, and glacial till / diamicton deposits are the least conductive. Only single estimates for materials interpreted as colluvium (9×10^{-4} m/s) and lacustrine / glaciolacustrine deposits (1×10^{-7}m/s) were available.

The distribution of data in bedrock as shown in Figure 11 suggests that the bedrock hydrostratigraphic units may be ordered from most to least conductive as follows: Kamloops Group, Iron Mask Hybrid, Picrite, Sugarloaf Diorite, Nicola Group.

Figures 12 and 13 show estimated hydraulic conductivity with respect to depth (where depth information is available). Overall, there is considerable variation (i.e. up to 6 orders of magnitude) in surficial deposits and shallow bedrock (i.e., less than 200 m deep) hydraulic conductivity in the dataset, with less (i.e., 4 orders of magnitude) variation in the deeper bedrock for on-site data. A general trend of decreasing bedrock hydraulic conductivity with depth is discernible from the data. This overall trend is common in bedrock settings as described by Rutqvist and Stephansson [2003]. Figures 12 and 13 also show that below approximately 200 m bgs, bedrock K is typically less than 1×10^{-8} m/s. This depth may also

be considered as the approximate maximum practical depth for groundwater resource development, as the majority of wells within the WRBC search record have been completed at depths shallower than 200 m bgs (Appendix C).

The presence/absence of faults and structural contacts in the packer tested intervals is also considered in Figure 12. The existing data indicate that the presence of a fault or shear within a tested interval does not indicate any general trend towards either significantly higher or lower hydraulic conductivity. However, as noted in Section 7.1.3 and BGC [2015b], the results from geotechnical investigations being completed as a part of the EA suggest that the investigated locations in the ELFZ have higher hydraulic conductivity than the surrounding bedrock.

	Hydrostratigraphic Unit	Hydraulic Conductivity Data (m/s)	Geometric Mean K $(m/s)^2$	Specific Storage (1/m)
		• Aberdeen • New Afton • Ajax 1E-11 1E-10 1E-09 1E-08 1E-07 1E-06 1E-05 1E-04 1E-03 1E-02		
SURFICIAL DEPOSITS	Fluvial and Glaciofluvial Sands and Gravels		1 E-05	1E-05 - 2E-03
	Glacial Till, Diamicton and Undivided Glacial Material		1 E-07	2E-06 - 2E-02
	Lacustrine and Glaciolacustrine Deposits and Undivided Recent Lake Sediments		1 E-07	1E-03[1]
	Mine Rock and Anthropogenic Materials		1 E-05	1E-03[1]
	Colluvium		9 E-04	1E-03[1]
	Undivided Surficial Deposits		4 E-08	1E-03[1]
	All Surficial Deposits		**5 E-07**	2E-06 - 2E-02
BEDROCK	Nicola Group Volcanics and Sediments		2 E-08	5E-07 - 4E-03
	Picrite		4 E-08	2E-07[1]
	Iron Mask Hybrid		5 E-08	4E-07 - 9E-04
	Sugarloaf Diorite		2 E-08	1E-06 -1E-07[1]
	Kamloops Group		1 E-07	1E-06[1]
	Unndivided Bedrock		5 E-08	1E-07 - 2E-03
	All Bedrock		**4 E-08**	1E-07 - 9E-04

Figure 11. Estimated Hydrogeologic Parameters within the RSA.

Notes:

1. Storativity estimates based on calibrated parameters in numerical groundwater flow model (BGC, 2015d) and assumed saturated thickness of 80 m for model cells within surficial deposits and 200 m for model cells within bedrock.
2. I Denotes first quartile, geometric mean and third quartile values for K estimated from SI data for the Ajax, Aberdeen and New Afton Mine areas.

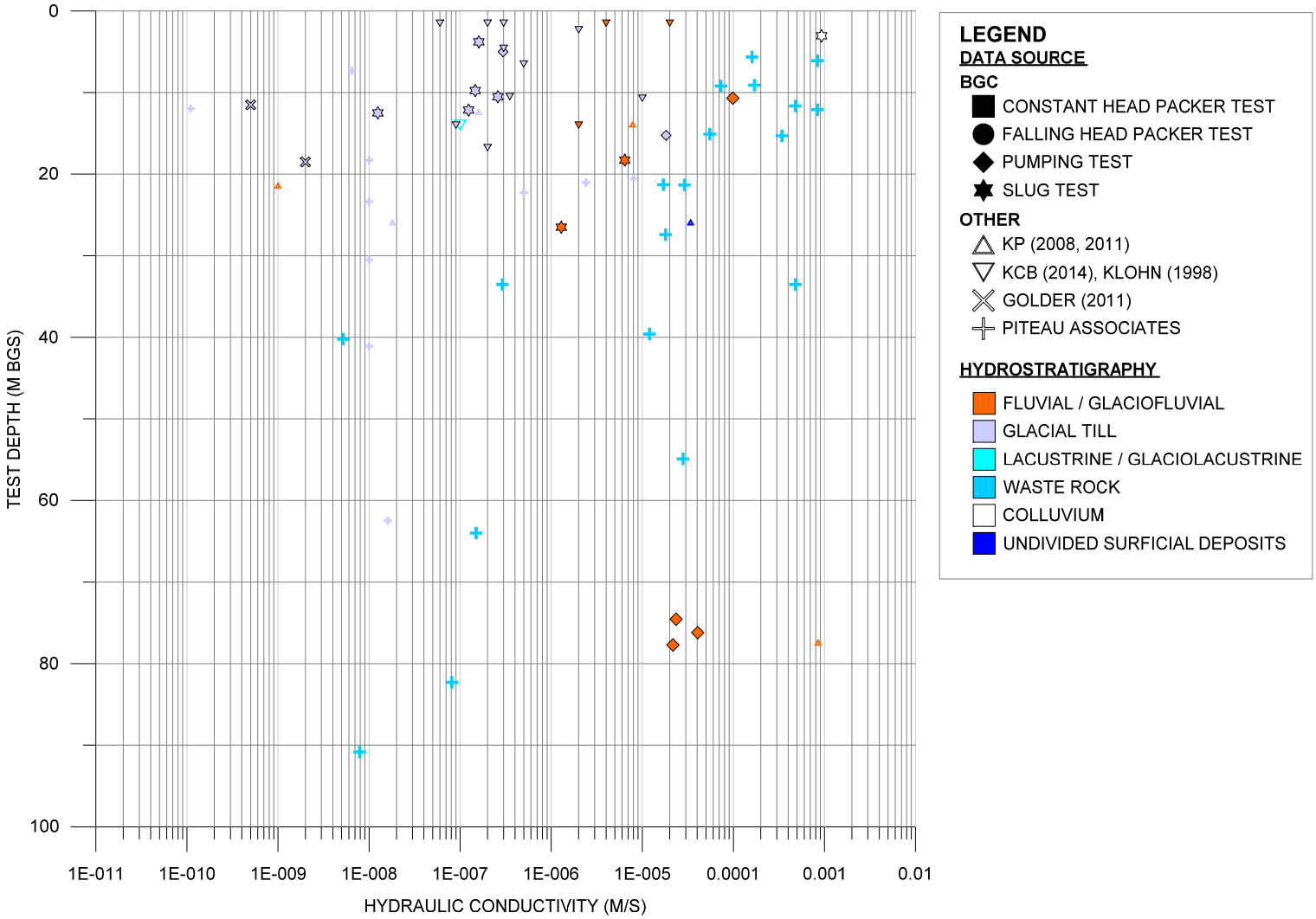


Figure 12. Estimated Hydraulic Conductivity vs. Depth within interpreted Surficial Hydrostratigraphic Units.

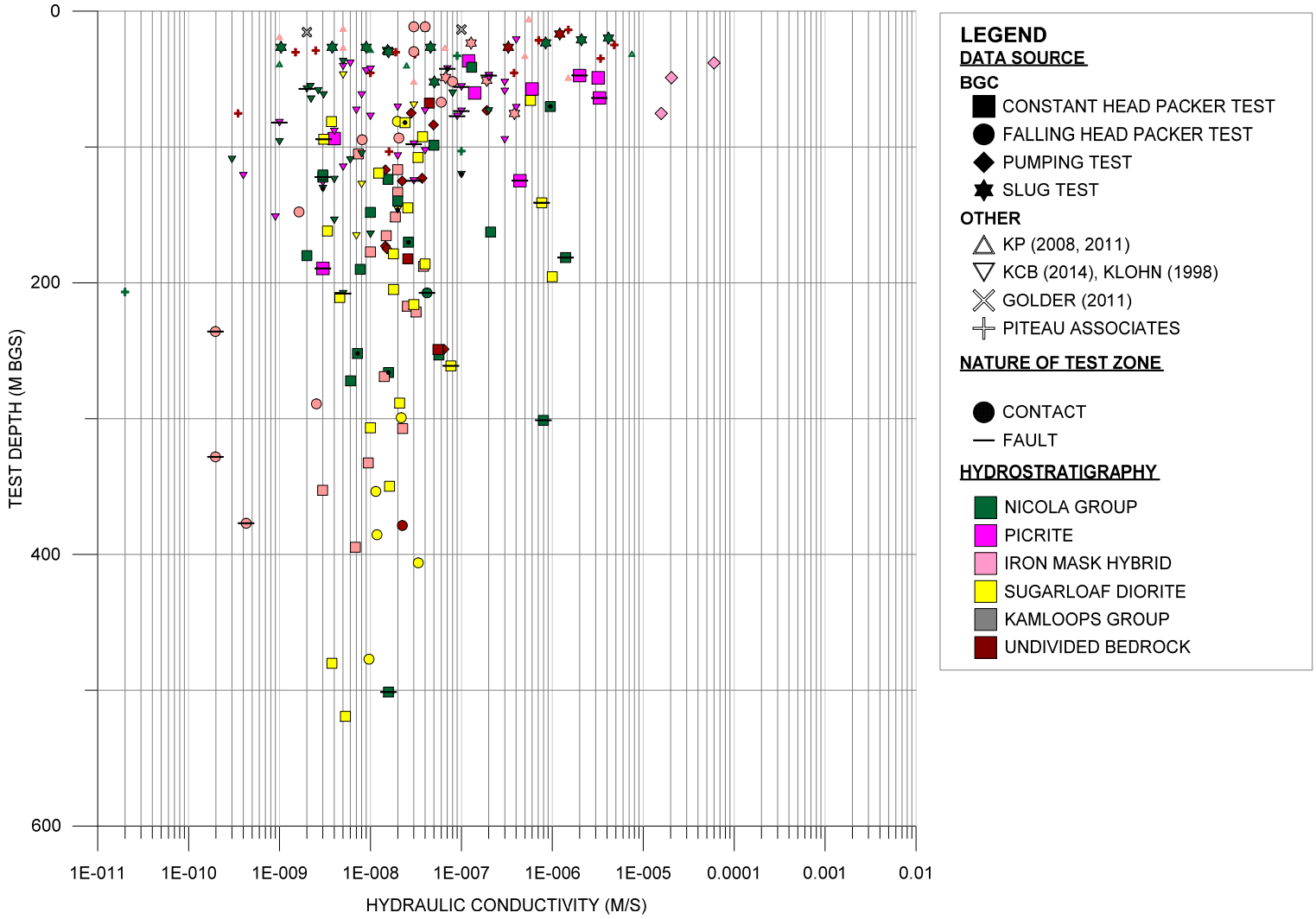


Figure 13. Estimated Hydraulic Conductivity vs. Depth within interpreted Bedrock Hydrostratigraphic units.

7.2.2. Storage

Estimates of specific storage at the site include values calculated from the results of pumping tests conducted at the west side of the planned open pit and north west from Jacko Lake [*BGC*, 2011c], within the Peterson Creek Aquifer to the south of the EMRSF [*BGC*, 2015g], and from slug tests conducted in wells installed as part of the BGC 2014 SI program [*BGC*, 2015f].

In the numerical groundwater flow model developed for the Ajax site [*BGC*, 2015d], specific storage was specified based on results obtained from SI data and guided by representative parameter values from the literature for bedrock and unconsolidated materials [Maidment, 1993]. Figure 11 provides a current summary of storativity estimates from both SI data and numerical model calibration for the interpreted hydrostratigraphic units in the area. Further detail on numerical model calibration methodology is discussed in BGC [2015d].

7.3. Seasonal Groundwater Elevation Trends (LSA)

Time-series groundwater elevation data from the active groundwater monitoring network (Table 2, Section 3.1.3) are plotted with meteorological data on the hydrographs provided in Appendix G. Data from several monitoring locations listed in Table 2 are not plotted in Appendix G due to sensor specifications not being available in time for this assessment (i.e., KAX-14-124A/B and KAX-14-130A/B), water levels being reported to be at the top of PVC pipe and thus not representative of groundwater elevation (i.e., flowing artesian conditions at BGC14-017D, DH-BGC11-ND-04 and MW11-06D/S) or wells being reported as dry (BGC14-001S, BH10-9 and BH10-14). The hydrograph figure numbers for each monitoring location within the active monitoring network are provided in Table 2.

The following observations are made about the seasonal data collected from the active monitoring network:

1. Where continuous measurements (i.e., data collected from dataloggers at set frequencies) are available, the data record indicates a fluctuation in groundwater levels on the order of 2.5 m or less, with the exception of BGC10-MWB-175 (which shows an apparent annual amplitude up to 3 m). It is possible that this higher amplitude is the result of nearby drilling adjacent to Jacko Lake during the monitoring period.
2. The hydrographs that show a discernable annual variation also show water levels decreasing over the course of the autumn and winter seasons (i.e., approximately from September to March) and recovering with the recharge that occurs associated with the spring freshet.
3. The groundwater recharge period is variable throughout the active monitoring network, i.e.:
    a. Some locations appear to reach maximum groundwater elevations in May/June. (e.g., BGG14-003D/I/S, 011D/S, 012D/S, 013, 016, 017S; DH-BGC11-ND-05, 09, BGC10-MWA-075/125/175; BGC10-MWB-075/125/175; KAX-13-004-D; AJGW01, 02-D/S, 03-D, 04-D, 05-S, 06-D, 07-D/S; MW11-09D/S, 10D).

   b. Some locations reach maximum groundwater elevations in September/October (e.g., potentially BGC14-009; DH-BGC11-ND-06, ND-08, ED-11; MW11-02, 04D/S, 05/D/S, 07D/S, 08D/S; KAX-13-004-S, 007-D/S; MW11-01S, 03S; AM-10-061-S; AE-10-064-D).

4. In general, a greater seasonal fluctuation amplitude in groundwater elevation corresponds with a relatively quick recharge period in wells screened within higher permeability materials (e.g., glaciofluvial sands or fractured bedrock). Similarly, a more subdued or attenuated hydrograph (fluctuations typically less than 0.5 m) is generally observed in wells that are screened within lower permeability materials (i.e., bedrock, till or diamicton), where maximum groundwater elevations occur in the fall (September – October).
5. There is also a general trend of a more subdued hydrograph with increasing depth of well completion; however, many shallow wells screened within till or diamicton also show an attenuated seasonal fluctuation in groundwater levels.
6. Some locations appear to show slight increases in water levels that occur rapidly (i.e., less than a month) following rain events, suggesting an enhanced connection to surface. The majority of wells showing this behaviour are located around the perimeter of the planned open pit to the north of Peterson Creek and are screened within till, fluvial or glaciofluvial materials or shallow bedrock (AJGW01-D, 02-D/S, 03-D, 04-D, 06-D, 07D/S). Other wells showing this behaviour are located around the perimeter of the TSF and screened within colluvium, till or shallow bedrock (BGC14-012S, 013, 016, 017S).
7. Seasonal variations cannot be interpreted at some locations because:
   a. The data record is limited to intermittent measurements (e.g., BGC13-021, 022, DH-BGC11-PS-03, ND-07, ES-16, WC-17, WC-18, PS-19, PS-20, PS-21, PS-22, PS-23, PS-24, PS-25, ND-26, BH10-10, 11-12),
   b. Ongoing monitoring of groundwater levels (for more than one year) is required to understand the seasonal variation (e.g., BGC14-001D, 002D/S, 004, 005, 006D/S, 010, 014D/S, 015D/S; DH-BGC-ED-14, ED-15; AW-09-103-D/S; KAX-14-107D/S, 108D/S, 114D/S, 121, 124S/B, 130B),
   c. Wells are reported as dry (e.g. BGC14-001S; BH10-9, 14) or with water levels above the top of PVC and representative groundwater elevations are not available (e.g. BGC14-017D; MW11-06D/S, DH-BGC11-ND-04),or
   d. Groundwater levels appear to have not yet recovered since instrument installation due to the wells being screened within till or diamicton (e.g. BGC14-007S and MW11-10S) or bedrock (e.g., BGC14-007D, 008D, MW11-01D and 03D) with low hydraulic conductivity.

Groundwater at monitoring locations showing a rapid response to recharge after rain events and/or the freshet may be completed in more permeable materials with little if any intervening low permeability material between the monitored zone and surface recharge.

The monitoring locations where recharge is delayed (i.e., in September or October) may be completed in less permeable units with limited connection to surface recharge.

Interpretation of hydraulic head data at the Ajax Project is influenced by on-site activities such as drilling, pumping and discharge at the ground surface for the purposes of groundwater sampling during the data collection period. For example, anomalous increases in water levels at AM-10-061-D, DG-BGC11-ED-11, BGC10-MWA-075/125/175 and MW11-09D/S are likely the result of drilling activities during 2013 and/or 2014. As noted in Section 3.1.3, the data record presented in Appendix G was filtered to exclude data collected during known testing events (e.g., groundwater sampling, slug tests, pumping tests); however, the data record for some wells (e.g., BGC14-006S, MW11-04S) appears to include a recovery response from these activities.

7.4. Potentiometric Surface and Groundwater Flow Direction

7.4.1. Regional Study Area

Using the available groundwater level data discussed in Section 3.1.3, an equipotential contour map for average annual conditions was prepared for the RSA (Figure 15). The available information suggests that the water table configuration is a subdued replica of topography, with depths to groundwater typically being greater in the uplands relative to the Kamloops River valley bottom. The general direction of regional groundwater flow is from south to north from Chuwels Mountain to Kamloops Lake/Thompson River. The flow system is predicted to be modified by local topographic highs and depressions within the RSA and groundwater divides are predicted to mimic topographic divides. These include a north-south trending divide to the west of the New Afton Mine site, a northwest-southeast trending divide just north of the Mine Site (between the Project and Aberdeen), and an east-west trending divide through the central LSA area.

The interpreted potentiometric surface suggests that the magnitude of groundwater entering the flow system varies spatially, with greater amounts of recharge in mountainous or upland areas and lesser amounts in depressions and valley bottoms. The interpreted potentiometric surface also suggests that discharge zones are generally restricted to streams, rivers , natural lakes and the open pit lakes at New Afton and the Ajax Mine Site. Based on the data collected by Piteau [2006] a local discharge zone is predicted in the area coinciding with the New Afton mine, just beyond the north west limit of the LSA.

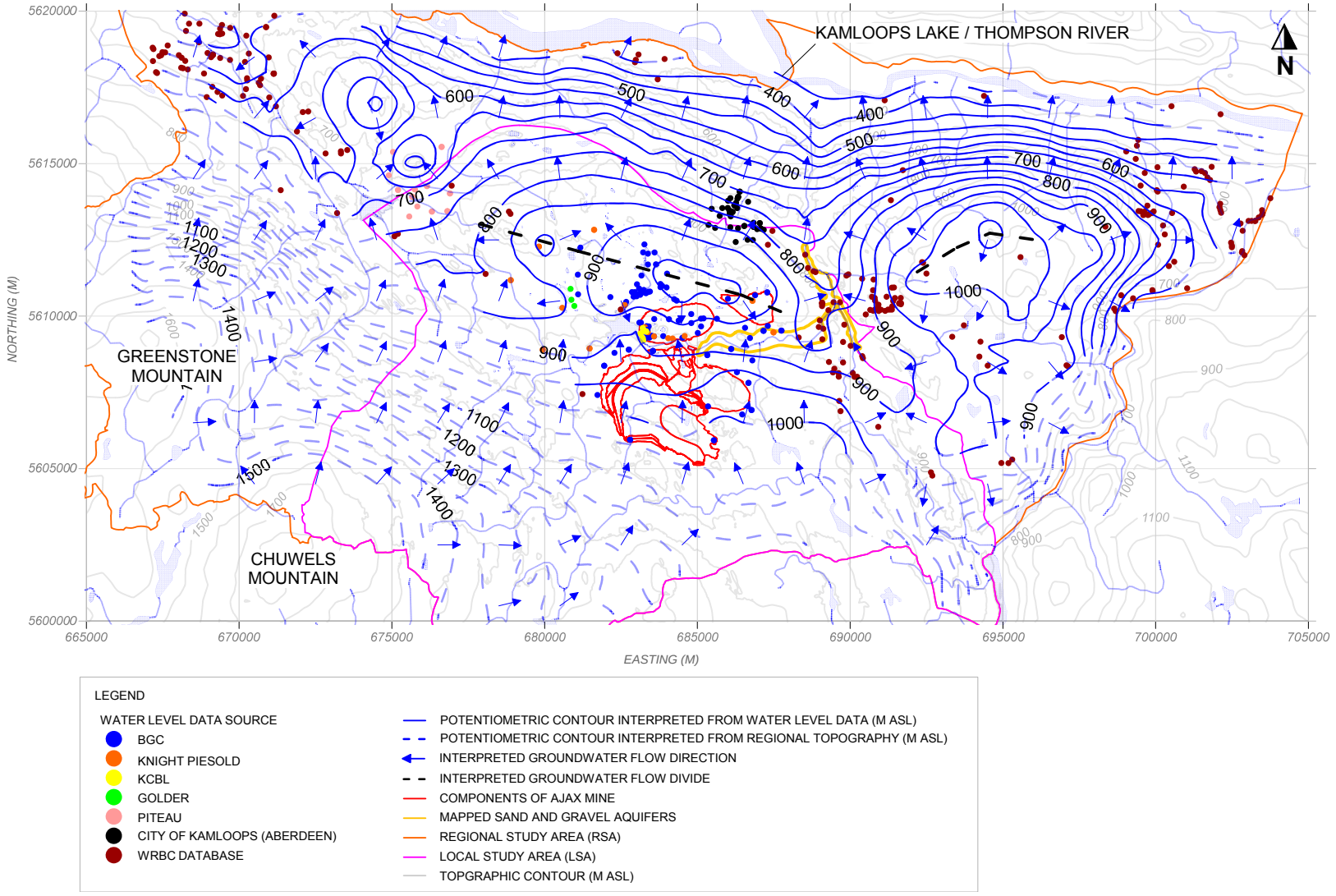


Figure 14. Interpreted RSA Water Table Configuration.

7.4.2. Local Study Area

Project-area potentiometric surfaces were prepared for average annual conditions in surficial deposits and bedrock using groundwater monitoring data discussed in Section 3.1.3. The potentiometric contours within surficial deposits and bedrock are presented in Figures 15 and 16, respectively.

Groundwater flow is interpreted to be controlled by the underlying bedrock topography, with higher groundwater elevations occurring in bedrock uplands. This is consistent with interpretations of seismic data completed by KP around the TSF (Appendix D). Groundwater within the LSA is interpreted to be recharged through uplands and discharge to lower lying areas, principally Peterson Creek and Jacko Lake, the existing Ajax West Pit lakes as well as other local ephemeral streams and ponds. Groundwater converges towards the existing Ajax West Pits and feeds a small water body occupying the pit floor. The groundwater monitoring data suggest that the groundwater system has not reached equilibrium, as groundwater levels in monitoring wells installed around the perimeter of the existing pits are considerably higher than the existing pit lake levels (e.g., approximately 902 masl at AJGW07-D/S, compared to approximately 875 and 837 masl for the existing Ajax West W and West E Pits, respectively). Some water entering the pit is lost to evaporation.

Groundwater flow within the surficial deposits is driven by regional and local topographical conditions and the distribution and magnitude of recharge. Infiltration from streams such as Upper Peterson Creek is a source of recharge to the shallow groundwater flow system. The shallow groundwater discharges to groundwater-fed lakes and ponds – for example Jacko Lake, Goose Lake and Edith Lake and as baseflow to streams and springs. Natural flowing artesian conditions (discussed further in Section 7.5.1) are observed in low-lying areas at the toes of slopes and in wells installed below or near upland areas. These include areas to the north of Jacko Lake and at several locations around the TSF and SMRSF (see Section 7.5.2 and Figure 17).

There is a groundwater divide in the shallow groundwater system separating groundwater from the Peterson Creek watershed with the northwesterly flowing Alkali Creek (Drawing 02). There is also a groundwater divide separating the mine area from the Aberdeen area. This groundwater divide is interpreted to extend below the topographical ridge located north of the mine area.

As a result of lower potentiometric elevations in bedrock wells, there is a downward component of groundwater flow from the shallow groundwater flow system to bedrock within some wells. Groundwater flow within bedrock appears to be less influenced by topographical controls than the groundwater movement within surficial deposits. Groundwater flow within bedrock may discharge locally to the Ajax Pits and to the surficial deposits infilling the Peterson Creek valley. Groundwater flow within bedrock likely also flows in a generally northerly to northwesterly direction toward the Thompson River. Similar to the shallow groundwater flow system, a bedrock groundwater divide is interpreted to be present between the mine area and the Aberdeen area.

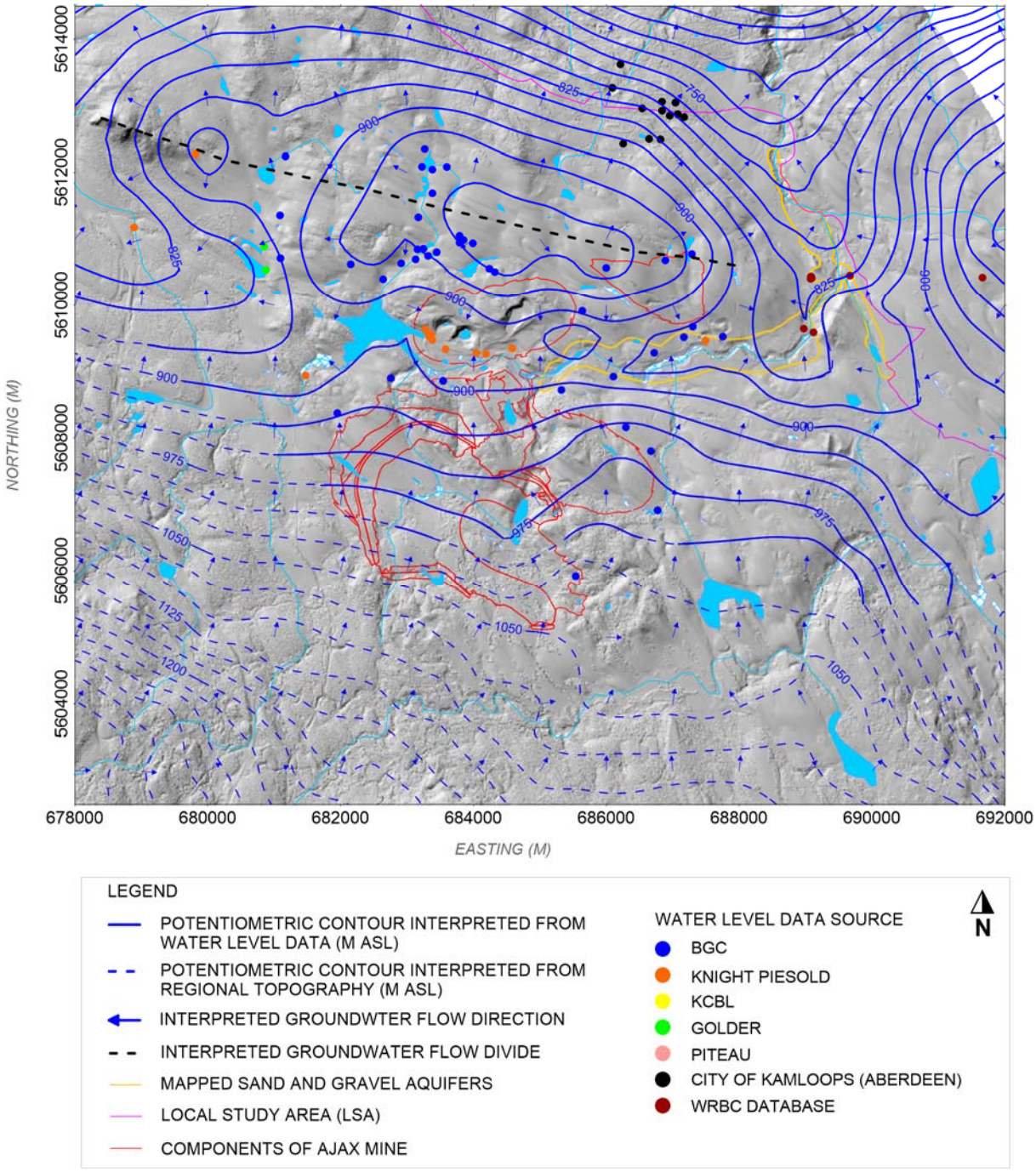


Figure 15. Interpreted LSA Water Table Configuration and Groundwater Flow Directions – Surficial Deposits.

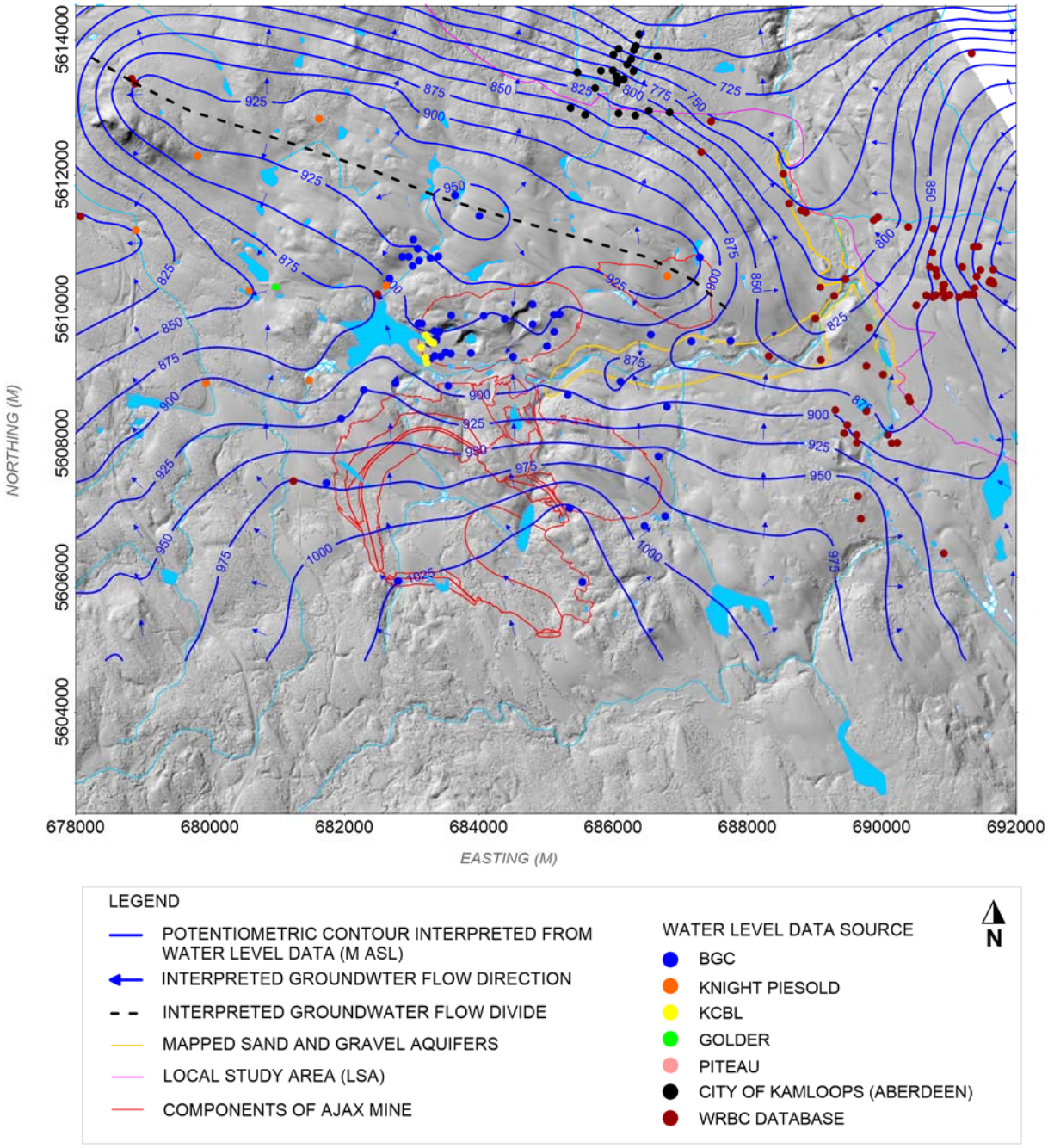


Figure 16. Interpreted LSA Potentiometric Surface and Groundwater Flow Directions - Bedrock.

7.5. Vertical Gradients and Flowing Artesian Conditions

Vertical hydraulic gradients provide an indication of the potential vertical component of groundwater flow through the comparison of groundwater elevations at monitoring locations with nested installations (i.e., more than one installation monitoring the formation at variable depths). For nested installations, a higher groundwater elevation in the shallow vs. deeper

installation indicates a downward component of gradient, whereas a higher groundwater elevation in the deeper installation indicates an upward component of gradient.

Vertical hydraulic gradients may provide an indication of potential groundwater recharge or discharge in shallow groundwater flow systems. In a recharge area, there is a component of groundwater flow near the ground surface that is directed downward. In a discharge area, there is a component of groundwater flow near the ground surface that is directed upward. Recharge and discharge areas may be defined as the portions of a drainage basin where net saturated groundwater flow is directed away from and towards the water table, respectively. [*Freeze and Cherry*, 1979].

It is noted that the presence of downward or upward hydraulic gradients do not unequivocally indicate that an area is a groundwater recharge or discharge zone. Observed vertical components of flow could simply be an indication of upward or downward migration of groundwater away from the point of measurement, with recharge and discharge occurring elsewhere along the flow path.

7.5.1. Regional Study Area

In the Aberdeen area, upward hydraulic gradients and flowing artesian conditions have been documented in an interpreted ancient landslide area and in the vicinity of the Van Horne Drive and Howe Road intersection. Downward hydraulic gradients within the Quaternary Units in the subdivision area have also been reported [*Golder*, 2008c].

7.5.2. Local Study Area

Vertical components of hydraulic gradient near the Mine Site were calculated using groundwater elevation data from nested piezometers where synoptic measurements were available. This included data from locations within the active monitoring network, as indicated in Table 8. Average vertical hydraulic gradients computed within surficial deposits for these locations are shown on Figure 17 with contours of depth to groundwater interpreted based on water level data in monitoring wells within surficial deposits. Gradient magnitudes and directions are summarized in Table 8 along with the gradient range, standard deviation and number of data points available for calculation at each location.

The vertical components of hydraulic gradient between the majority of well pairs near the Mine Site are directed downwards, with steeper gradients predicted in local upland areas (Figure 17, Table 8). Well pairs that show upward directed hydraulic gradients are all located in local depressions or low areas adjacent to local topographic highs. This suggests that the local groundwater system in these areas is recharged from adjacent local uplands with topographically driven groundwater flow towards local lowlands. Both downward and upward hydraulic gradients were noted within well pairs installed along Lower Peterson Creek. This suggests that there may be gaining and losing reaches along the water course. This observation is supported by simulation results with the calibrated numerical groundwater flow model developed for the Project [*BGC*, 2015d].

Table 8 and Figure 17 show that downward groundwater flow is predicted in the following areas of the Mine Site:

- South of the EMRSF and north of Lower Peterson Creek at BGC14-005/BGC13-022 and MW11-10D/S
- North of the EMRSF at MW11-05D
- North of the SMRSF and South of Lower Peterson Creek at BGC14-007D/S and 008D/S
- East of the SMRSF near Humphrey Creek at BGC14-014D/S
- South west of Jacko Lake and near Jacko Creek at MW11-08D/S
- Near the south west wall of the planned open pit and east of Jacko Lake at AW-09-103-D/S, BGC10-MWA and MWB, KAX-13-004-D/S and 007-D/S
- Within the planned open pit area at AJGW02-D/S, AW-10-105-D/S and AM-10-061-D/S
- West of the Mine Site at MW11-01D/S and 03D/S.

These observations suggest that groundwater recharge may occur near the above monitoring locations.

Table 8 and Figure 17 show that upward groundwater flow is predicted in the following areas of the Mine Site:

- North of the WMRSF at BGC14-002D/S, 003D/I/S and 012D/S near Keynes Creek, Lower and Upper Peterson Creek, respectively
- South of the TSF South Embankment at BGC14-011D/S near an intermittent stream that drains into Keynes Creek
- Near the south eastern limit of the TSF at BGC14-017D/S near an unnamed stream that drains into Goose Lake
- South of the EMRSF at BGC14-004/BGC13-021 near Lower Peterson Creek
- Near the north eastern limit of the EMRSF at and BGC14-006D/S near an unnamed tributary of Lower Peterson Creek
- South of the eastern limit of the SMRSF at BGC14-015D/S near Humphrey Creek
- North of Jacko Lake at MW11-04D/S and 06D/S near an unnamed intermittent stream that drains into Jacko Lake
- North of Jacko Lake at MW11-07D/S near the endorheic basin containing Nelson Lake
- The planned open pit at AJGW07-D/S near the existing Ajax West W pit
- West of the Mine Site at MW11-09D/S near the endorheic basin containing Wallander Lake.

These observations suggest that groundwater discharge may occur near the above-noted monitoring locations and surface water bodies.

Local flowing artesian conditions were observed near the Mine Site within several of the monitoring wells noted above. These monitoring wells are located at the toes of slopes and/or installed below or near upland areas and include:

- MW11-04D, MW11-06D/S, which are located to the north of Jacko Lake near the west end of the planned open pit
- MW11-07D, which is located northwest of the Mine Site beyond an interpreted groundwater flow divide
- BGC14-012D, which is located north of the WMRSF
- BGC14-015D/S, which are located near the south eastern limit of the SMRSF
- BGC14-017D/S, which is located near the south eastern limit of the TSF.

In addition, flowing artesian conditions were noted at DH-BGC11-ND-04, which is located north of Jacko Lake. This observation suggests potential groundwater discharge near this location and an unnamed intermittent stream that drains into Jacko Lake.

Monitoring locations showing local flowing artesian conditions are summarized in Table 8 and shown on Figure 17 below. The extent and location of flowing artesian conditions are not surprising based on site topography and observed depth to water within the groundwater level monitoring network. Some locations where flowing artesian conditions are observed may facilitate compliance monitoring and/or interception of potential seepage from the Mine facilities during operations and post closure (i.e., BGC14-012D/S, 017D/S and 015 D/S for the WMRSF, TSF and SMRSF, respectively).

It should be noted that the vertical component of hydraulic gradient calculated for piezometers installed at KAX-13-004-D/S, 007-D/S and AW-09-103-D/S, AW-10-105-D/S and AM-10-061-D/S are approximate as VWPs are installed into inclined holes. Vertical component of hydraulic gradients calculated for piezometers installed at MW11-01D/S, 03D/S, 10D/S, BGC14-006D/S, 007D/S, 008D/S and 017D/S are also approximate, as the water levels at these locations appear to be recovering.

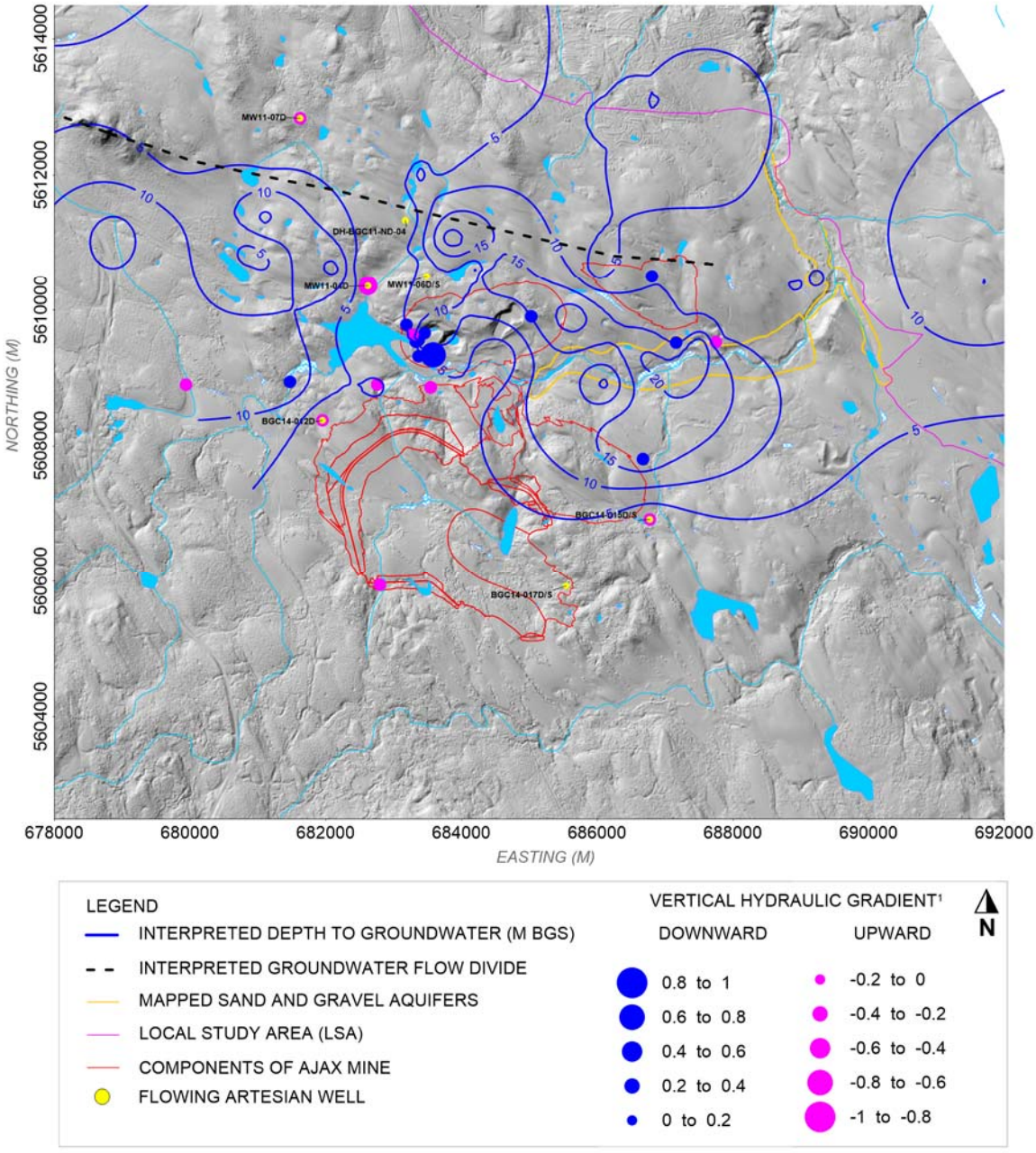


Figure 17. Interpreted Depth to Groundwater and Vertical Components of Hydraulic Gradients in the LSA

Notes:

1. Negative sign indicates potential upward component of groundwater flow.
2. Depth to groundwater contours interpreted from water level data at groundwater monitoring locations within surficial deposits.
3. Vertical components of hydraulic gradients calculated for piezometers installed at MW11-01D/S, 03D/S, 10D/S, BGC14-006D/S, 007D/S, 008D/S and 017D/S are not shown as water levels at these locations are recovering.

7.6. Groundwater Seeps and Springs

Springs and seeps represent natural groundwater discharge, and can be used as an indicator of in-situ geochemistry. The geochemical fingerprint of the springs can also be used to understand the source of recharge to the spring and general hydrogeological setting. Springs are often found in topographic lows or where higher hydraulically conductive rock units overlie rocks of much lower hydraulic conductivity (Figure 18). Seeps and springs can also occur where faults or fracture zones daylight in rock of low hydraulic conductivity, where groundwater movement is principally through these fractures [Fetter, 2001]. Some springs represent the intersection of the land surface and a larger groundwater system, whereas other springs represent local, typically seasonal, discharge from a smaller recharge area.

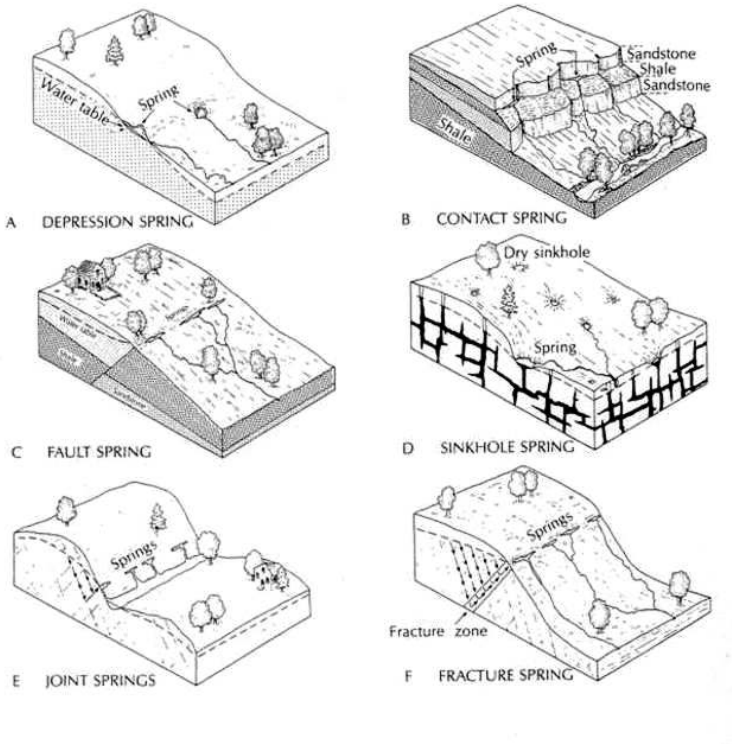


Figure 18. Types of Groundwater Springs - from Fetter (2001).

7.6.1. Regional Study Area

Extensive groundwater springs and seeps have been noted in the Aberdeen area by Golder [2008c], and are most common within fault-bounded “panels” of land where the Nicola Group is adjacent to the Kamloops Group formation. They indicate that seeps are generally absent south of the Python Lake Fault, which corresponds to the IMH/Nicola Group contact, north of the Ajax mine. Golder [2008c] also noted springs and seepage faces associated with Nicola Volcanic outcrops near the Thompson River, and seeps within Kenna-Cartwright Park (Dufferin Area) associated with white sulphate efflorescence that is most obvious during summer months.

7.6.2. Local Study Area

No springs have been observed near the Mine Site. Minor seeps have been noted from fractures in the existing Ajax West and East Pit walls during several SIs carried out by BGC between 2010 and 2014. During spring and summer seep flow rates are difficult to measure and are typically limited to moist or damp rock faces on joint planes or in shadowed or overhanging areas. During winter, these seeps are most notable by ice build-up on the existing pit walls, particularly the West Pits. Flowing water was not observed at any of these locations during four site visits (i.e., in April 2010, December 2010, January 2011 and July 2012) conducted by BGC. Seepage faces observed in the existing Ajax Pits are interpreted to indicate migration of groundwater into localized groundwater level depressions caused by earlier mining activities.

8.0 GROUNDWATER QUALITY

8.1. Regional Study Area

Groundwater quality records reviewed by Zubel [2001] for the Thompson River watershed are limited and cover a larger region than the RSA. Zubel indicates that groundwater is typically bicarbonate or sulphate type in wells constructed in bedrock and is generally bicarbonate type in wells constructed in unconsolidated sediments. Zubel also reported high levels of TDS (> 500mg/L) and sulphate (> 500mg/L) in many water samples and indicated a source of sulphate may be the sulphate-rich rocks around the east end of Kamloops Lake. Water quality in the area is characterized as very hard and highly mineralized [Zubel, 2001].

Groundwater quality data reported within Golder [2008c] were collected from locations within the RSA ranging from Chuwels Mountain to the Aberdeen subdivision area. Within Aberdeen, groundwater quality was reported as alkali, having high TDS and to be of sodium-magnesium and bicarbonate-sulphate type. A general trend towards increasingly sodium rich waters was noted to occur with depth in the Aberdeen subdivision area, whereas water samples from shallow wells and springs reported to be more magnesium-type. Chloride was noted to exhibit an increase in concentration with decreasing altitude; this was inferred by Golder [2008c] to have resulted from evaporation, concentrating meteoric chloride concentrations infiltrating to the water table. High nitrate concentrations were also noted within the sample suite, particularly in lakes (up to 4 mg/L), and seeps and springs (up to 6 mg/L) within the subdivision area. Unlike chloride, nitrate was reported to exhibit no correlative relationship with ground elevation.

8.2. Local Study Area

As noted previously, a groundwater quality monitoring program has been in effect since 2007 with sampling completed on an approximately quarterly basis in many of the project monitoring wells. Detailed review of the program results, including a discussion of data quality, is provided by KP [2013a; 2015b]. Detailed geochemical assessment of the groundwater quality within the Peterson Creek and Cherry Creek catchments is beyond the scope of this report; however, a limited review of major water quality indicator parameters was completed to improve the conceptual understanding of the local study area hydrogeologic setting.

Groundwater quality data for the project area was assessed by KP [2015b] with respect to well installation depth and the lithology of the well completion zone. This was further interpreted with respect to proximity to local groundwater recharge (upland areas) and discharge zones (historical open pits, Jacko Lake, Peterson Creek, and local sloughs) and proximity to the deposit area and historic waste rock. The overall LSA groundwater quality as reported by KP [2015b] is summarized in Section 0. Potential trends in groundwater quality with depth and lithological unit as reported by KP [2015b] are summarized in Sections 8.2.2 and 8.2.3, respectively.

8.2.1. Overall LSA Groundwater Quality

KP [2015b] characterized the local groundwater quality near the Mine Site as alkaline, hard to very hard and high in total dissolved solids (TDS). Based on TDS concentrations, 52% of the monitoring wells that were sampled produced freshwater, 35% produced slightly saline water and 12% of wells produced moderately saline water [*KP*, 2015b]. KP [2015b] interpreted TDS concentrations as increasing along groundwater flow paths, with lower concentrations typically noted in groundwater samples collected from monitoring wells installed at higher elevations or in upper reaches of local catchments (i.e., potential groundwater recharge areas). Higher TDS concentrations were typically noted in samples collected from monitoring wells installed at lower elevations such as sloughs and creeks (i.e., potential groundwater discharge areas). KP [2015b] indicated that the highest TDS values were observed in samples collected from monitoring wells installed near the existing Ajax Pits and near the Peterson Creek Aquifer.

KP [2015b] identified the major water types near the Mine Site to be sodium-sulphate, magnesium-sulphate, or sulphate type. Sulphate concentrations were elevated in groundwater samples throughout the study area, with the highest sulphate concentrations noted in wells installed near local groundwater discharge areas, such as the Ajax West open pits, sloughs, Inks Lake and Peterson Creek. KP [2015b] noted that the lowest sulphate concentrations were in samples from monitoring wells in the Keynes Creek and Humphrey Creek watersheds.

KP [2015b] also indicated that bicarbonate was the dominant anion only in samples collected from monitoring wells in upland areas of the Humphrey Creek and Keynes Creek watersheds (i.e., where sulphate concentrations were lowest) and at a few monitoring wells south of Jacko Lake. It was suggested that this was likely due to closer proximity of these wells to local groundwater recharge areas compared to other monitoring sites in the project area [*KP*, 2015b].

Elevated fluoride concentrations were reported within groundwater samples collected from monitoring wells throughout the project area though locally enriched near the proposed Open Pit [*KP*, 2015b].

KP [2015b] indicated that only weakly dominant cations were observed in the water quality results, and that this varied by location with respect to the Mine Site facilities, i.e.:

- Sodium was noted to be the dominant cation in samples from deeper monitoring wells located in the Open Pit area, and wells to the west and north of Jacko Lake.
- Magnesium was noted to be the dominant cation in samples collected from shallower monitoring wells located in the Open Pit area and most wells to the east and southeast of the Open Pit.
- Calcium was noted to be weakly dominant in samples collected from a few wells located between Jacko Lake and the Ajax West open pits.

Elevated trace metals and metalloids within groundwater near the Mine Site include arsenic, boron, manganese, molybdenum and selenium. KP [2015b] indicated that concentrations of these parameters also varied according to monitoring location, e.g.:

- Arsenic, boron, manganese, and selenium concentrations tended to be higher in samples collected from monitoring wells installed in the Open Pit area.
- Arsenic, molybdenum, and selenium tended to be higher in samples collected from monitoring wells installed in the waste rock backfill in the historical Ajax East Pit.
- Manganese and iron concentrations were elevated in samples from monitoring wells installed in the vicinity of the proposed EMRSF and in the lower reaches of the Humphrey Creek watershed.

KP [2015b] noted that trace metal and metalloid concentrations did not always correlate well with major ions, and that their distribution appeared to be more strongly influenced by local geological enrichment in specific minerals and by proximity to the Open Pit area. KP [2015b] indicated that concentrations of aluminum, chromium, cobalt, copper, mercury, uranium, and zinc were elevated compared the generic water quality guidelines, and the majority of these parameters were measured at very low concentrations, if detected at all, and were not widespread in the LSA.

8.2.2. Water Quality Trends associated with Depth

KP [2015b] examined groundwater quality samples from monitoring locations with nested installations to determine whether any consistent trends with depth could be deciphered. The following observations were made based on water quality results from these wells:

- Groundwater pH was typically higher in shallower wells
- Hardness and alkalinity concentrations typically decreased with depth
- Fluoride, arsenic, boron, iron, and manganese concentrations typically increased with depth.
    - Exceptions to this were noted for manganese and fluoride at BGC14-003D/I/S and iron at the BGC14-002D/S; concentrations for these parameters at these monitoring sites decreased with depth.
- TDS and sulphate concentrations tended to be similar in samples from deep and shallow wells at the same monitoring locations.
- No trends with completion depth were noted for selenium or molybdenum.

KP [2015b] collected considerably more samples were collected from monitoring well pairs where upward hydraulic gradients or flowing artesian conditions were observed (i.e., AJGW07-D/S, MW11-06D/S, MW11-07D/S, MW11-09D/S, BGC14-002D/S, BGC14-003D/I/S, BGC14-006D/S, BGC14-011D/S, BGC14-012D/S, BGC14-015D/S, and BGC14-017D/S) compared to well pairs where downward hydraulic gradients were observed (MW11-05D/S and AJGW02-D/S). KP [2015b] therefore did not summarize general observations for well pairs where downward hydraulic gradients were observed due to the limited dataset for groundwater quality data specific to those areas.

8.2.3. Water Quality Trends associated with Completion Lithology

KP [2015b] indicated that water quality signatures generally were not distinct for the specific bedrock or surficial lithological units interpreted near the Mine Site, and that water quality was more easily distinguished by location in the Project area. The groundwater quality within all interpreted units was sodium-magnesium-sulphate type, with the exception of some samples collected from wells screened within Nicola Volcanics, which were bicarbonate and intermediate bicarbonate-sulphate type and/or were weakly dominant in calcium.

KP [2015b] also indicated that trace metal and metalloid concentrations did not correlate well with interpreted lithological units of monitoring well completion zones and that *"..the distribution appears to be more strongly influenced by local geological enrichment in specific minerals (deposit area) and by proximity to local scale groundwater discharge areas which are typically at lower elevation in the Project area (historical open pit, Peterson Creek, Peterson Creek Aquifer)."* KP [2015b] indicated that the only correlation of trace metal and metalloid enrichment to specific surficial lithological unit in the Open Pit area was within groundwater samples collected from wells installed into waste rock backfill in the historical Ajax East Pit.

9.0 GROUNDWATER BUDGET

A groundwater budget is generally based on the concept that, under steady state groundwater flow conditions, the mass of water introduced to a flow system must equal the mass of water exiting the system (i.e., mass is conserved and transient effects [e.g., groundwater injection or abstraction, seasonal fluctuations, or storage changes] are not occurring).

Within the RSA, the water introduced to the groundwater system enters naturally as meteoric recharge (i.e., rain and snow melt) both locally and distally at higher elevations. Groundwater may also enter the system as infiltration of surface water at creeks and gullies where there is a downward component of hydraulic gradient. An additional source of recharge to developed areas is supplied through irrigation by the municipality (e.g., parks, playfields, medians, leaking pipes, and other landscaped areas), homeowners (e.g., lawn watering and gardening) and businesses (e.g., golf courses) that are serviced by the City's water supply system. Net infiltration of meteoric water (i.e., potential diffuse groundwater recharge) is generally estimated as total precipitation subtracting runoff and evapotranspiration losses (i.e., root uptake and evaporation). However, any additional recharge flux introduced through irrigation and other sources is included in the groundwater budget if appropriate. The extent of areas serviced by the municipal water supply within the RSA is shown on Drawing 02 [*City of Kamloops*, 2013a].

Groundwater generally discharges naturally from the hydrogeological system as base flow to rivers and streams, as groundwater discharge to lakes, ponds, springs and seeps, and as shallow evapotranspiration where the water table is very close to ground surface. Groundwater abstraction associated with the Aberdeen Dewatering and Monitoring System (DWMS) required to maintain subdivision slope stability [*City of Kamloops*, 2008] also removes groundwater (Section 1.2.1). Additionally, pumping from registered water wells in rural and residential areas removes water from the hydrogeological system. Former and active mine pits (i.e., the existing Ajax Pits and the Afton Pit, Drawing 03) may also be long-term local sinks for groundwater removed due to pit dewatering and depressurization during mining, and gradual pit flooding after mining is complete.

Estimates of groundwater recharge are often derived from seasonal low surface water flow (base flow) measured at stream gauging stations. However, due to the arid climate, significant surface water management (e.g., storage dams, diversions, water licenses) for crop/livestock watering, rural/residential domestic groundwater use and slope stability management, seasonal low flow rates likely do not represent undisturbed groundwater discharge rates in the RSA. Developing a groundwater budget for the RSA therefore requires additional analysis, as described below.

The following sections identify the various groundwater sources and sinks, and present estimates of the potential ranges of groundwater recharge and discharge. A summary of representative values of groundwater inputs and outputs is provided in Table 9. These values guided the calibration of the numerical groundwater flow model [*BGC*, 2015d]..

9.1. Groundwater Recharge

9.1.1. Meteoric Sources

9.1.1.1. Regional Study Area

Previous estimates of natural infiltration to the water table within the RSA have been reported by Piteau Associates [2006] through numerical modelling and by Golder [2008c] using a chloride mass balance (CMB) method (described below and in Healy [2010]). A summary of these reported values is provided in Table 10. Using available regional climate data, Golder [2008c] further extrapolated their estimates to predict infiltration for elevation bands ranging from 350 to 1828 m asl and to reflect differences in recharge due to the orographic effect of precipitation in the region. These results are provided in Table 11.

9.1.1.2. Local Study Area

BGC estimated potential infiltration to the water table in the LSA from meteoric sources using the CMB method and data collected from monitoring wells installed near the Mine Site. Inputs for the CMB method include chloride concentrations in project-area groundwater monitoring wells reported by KP [*KP*, 2013a; 2014c] that were above instrument detection limits, the average annual precipitation from the AJAXMET climate station of 336 mm/yr [*KP*, 2014a] , and an assumed weighted average chloride concentration in precipitation of 0.12 mg/L in the Kamloops area (based on data from Environment Canada, [*Golder*, 2008c]). The distribution of recharge estimates using the CMB method is shown on Figure 19 with representative values (i.e., geometric mean) for the various lithology types. As shown in in Figure 19, the range in representative recharge estimates is between 0.9 and 5.7 mm/yr (0.3% and 1.7% of mean annual precipitation (MAP)). Recharge estimates calculated using the CMB method are also summarized in Table 12.

Unsaturated flow modelling through the planned Mine infrastructure (i.e., MRSFs and TSF) using HYDRUS-1D [Šimůnek et al., 2008] is currently being completed by BGC as part of the water balance model (WBM) that is under development for the Project EA. Results from this work suggest that average infiltration through fine-grained tills is approximately 8 mm/year, which is in agreement with Site estimates using the CMB and also the values reported by Golder, and is considered to be a representative value for recharge near the Mine Site. A description of HYDRUS-1D and conceptual details and inputs to the model are presented in BGC [2015c].

Estimates made based on site data (both with the CMB method and HYDRUS-1D modelling) are in reasonable agreement with estimates of recharge for elevation ranges similar to the Ajax Mine Site reported by Golder [2008c] using the CMB method (i.e., 2 mm/yr (0.5 % MAP) at Goose Lake, 960.1 m asl, Table 10), and by their extrapolation to various elevation bands (i.e., approximately 0.55 to 0.74 mm/yr (0.2 % MAP) from 700 to 900 m asl, and between 2.72 and 3.68 mm/yr (0.8 and 0.9% MAP) from 900 to 1,200 m asl, Table 11)..

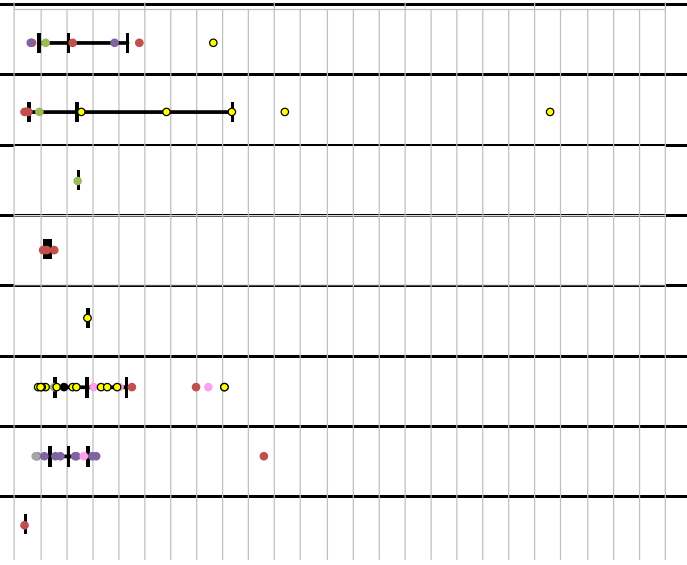
Hydrostratigraphic Unit	Mine Facility / General Location	Geometric Mean Value (mm/yr)	% MAP
Fluvial and Glaciofluvial Sands and Gravels		4.2	1.3%
Glacial Till, Diamicton and Undivided Glacial Material		4.8	1.4%
Lacustrine and Glaciolacustrine Deposits and Undivided Recent Lake Sediments		4.9	1.5%
Mine Rock and Anthropogenic Materials		2.6	0.8%
Colluvium		5.7	1.7%
Nicola Group Volcanics and Sediments		5.6	1.7%
Iron Mask Hybrid		4.2	1.2%
Unndivided Bedrock		0.9	0.3%

Figure 19. Estimated Groundwater Recharge near the Mine Site using the Chloride Mass Balance Method.

1. | Denotes first quartile, geometric mean and third quartile of estimated recharge values.

9.1.2. Anthropogenic Sources

Golder [2008c] estimated natural recharge in the Aberdeen area to be approximately 0.55 mm/yr but indicates that anthropogenic recharge from irrigation (lawns, playing fields, golf course) water infiltrating to the water table in this area could exceed natural recharge rates by up to two orders of magnitude. The increases in piezometric pressures that cause slope instabilities in Aberdeen are driven by anthropogenic recharge (domestic and municipal irrigation, leaking pipes and sewers, etc.) because the size of the subdivision has increased substantially since the 1970s [*Golder*, 2008c].

A wide range in estimates of the annual anthropogenic infiltration in residential and golf course areas in Aberdeen were reported by Golder [2008c]. These values were calculated from metered water use compiled by the City, as well as measured irrigation residential water use from 10 “Residential Cooperators” in a study completed by Chanasyk [2000]. Residential and golf course infiltration estimates were 370 and 924 mm/yr based on the City data, and 61 and 153 mm/yr based on the Chanasyk analysis [*Golder*, 2008c]. In their numerical modelling simulations Golder [2008c] found that anthropogenic recharge rates of 135 mm/yr for residential and 336 mm/yr for golf course areas were able to simulate the hydraulic heads measured in Aberdeen.

Detailed irrigation data for infiltration calculations outside of Aberdeen that are serviced by the City’s municipal water supply (shown on Drawing 02) are not available for this assessment. However, it is reasonable to assume that landscaping practices and associated water use in these areas are similar to Aberdeen. The infiltration quantities estimated and compiled by Golder [2008c] for Aberdeen are therefore extrapolated to these areas.

In addition to residential and golf course irrigation, ranch irrigation could potentially contribute significantly to groundwater recharge. The existing surface water use licenses for Cherry Creek indicate that a total of approximately 1.2 Mm^3 of water is allocated to irrigation on an annual basis upstream of the Cherry Creek below Pendleton Creek gauging station (No. 8LF086 (See Drawing 08 of BGC [2015a]). Existing surface water licenses for irrigation within the Peterson Creek Watershed that could provide a source of groundwater recharge include the following [*BGC*, 2015a] :

- Peterson Creek below Jacko Lake (620,763 m^3/yr)
- Peterson Creek above Jacko Lake (530,396 m^3/yr)
- Keynes Creek (55,013 m^3/yr)
- Anderson Creek (529,903 m^3/yr)
- Davidson Brook (115,947 m^3/yr)
- Separation Lake (156,035 m^3/yr).

Because no data exist as to which licenses are exercised on an annual basis and to what extent, it is difficult to quantify the amount of diverted surface water that potentially could infiltrate to the water table. Given the high potential evapotranspiration estimated for the area

(524 to 584 mm/yr KP [2014a], Section 9.2.2), irrigation during the growing season would most likely be consumed by ET. However, over-irrigation could allow water to infiltrate below the rooting zone and enter the groundwater system.

9.2. Groundwater Discharge

9.2.1. Baseflows

9.2.1.1. Regional Study Area

Long-term average flows measured at regional climate stations have been compiled and summarized by BGC [2015a] and KP [2013b]. Ranges in monthly average flows during the project low flow period (i.e., July through November) for the various Water Survey of Canada (WSC) stations were considered to approximate groundwater baseflows. The stations with available data are listed below. Of these stations, only Cherry Creek below Pentleton Creek (08LF086) is within the groundwater RSA (See Drawing 08 of BGC [2015a] and Figure 2.1 of KP [2013b]). Average flows during the low flow period were reported are as follows:

- Salmon River Above Salmon Lake, 08LE075: between 0.2 and 0.8 m^3/s (44 to 177 mm/yr for a catchment area of 143 km^2)
- Criss Creek Near Savona, 08LF007: between 0.4 and 1.7 m^3/s (26 to 112 mm/yr for a catchment area of 479 km^2)
- Deadman River at Criss Creek, 08LF027: between 0.6 and 2.3 m^3/s (22 to 83 mm/yr for a catchment area of 878 km^2)
- Guichon Creek at Outlet of Mamit Lake, 08LG041: between 0.2 and 1.2 m^3/s (7 and 44 mm/yr for a catchment area of 871 km^2)
- Nicola River above Nicola Lake, 08LG049: between 0.7 and 4.9 m^3/s (15 to 103 mm/yr for a catchment area of 1,500 km^2)
- Guichon Creek above Tunkwa Lake Diversion, 08LG056: between 0 and 0.2 m^3/s (0 and 81 mm/yr for a catchment area of 78.2 km^2)
- Cherry Creek below Pendleton Creek, 08LF086: between 0.025 and 0.216 m^3/s (6 and 55 mm/yr for a catchment area of 123 km^2) [8].

As noted in Section 0, seasonal low flows at some of the regional hydrometric stations have been impacted by surface water management, land use and groundwater use, which accompany ranching and residential development. As a result, seasonal low flow rates in the area do not necessarily represent natural groundwater discharge rates (e.g., Cherry Creek station). The extent to which groundwater discharge has been modified at these stations has not been estimated due to limited documentation on water use practices.

[8] The WSC report a drainage area of 143 km^2 for this station, but analysis of available GeoBase contour data in BGC (2015d) indicates that the WSC estimate is inaccurate.

9.2.1.2. Local Study Area

Vertical hydraulic gradients calculated from data collected at monitoring wells near streams near the Mine Site suggest that Peterson Creek and its tributaries may be characterized by a combination of recharge and discharge zones (Section 7.5.2). As such, baseflows are not expected to be observed consistently along the stream lengths within the LSA. However, the available flow measurement data were examined to provide an estimate of potential baseflows in the LSA.

Near the Ajax Mine Site, six (6) surface water gauging stations have operated between 2008 and 2014. Results of the 2014 surface water monitoring program, which was carried out for five stations between March and early October [*BGC*, 2015e], give the following flow ranges for the low flow period between July and September as presented in BGC [2015a]:

- Jacko Lake Inflow (JACINF): This station is located on Peterson Creek upstream of Jacko Lake and has a catchment area of 31 km^2. Flows ranged between 0.002 and 0.027 m^3/s (2 to 28 mm/yr over the catchment area) in August and September (data were unavailable at this station for July).
- Jacko Lake (JACLAKE): This gauge monitors Jacko Lake water levels and flow over the Jacko Lake spillway, which was observed to be dry from mid-July onwards. The catchment area is 41 km^2. Flows ranged between 0.000 and 0.062 m^3/s (0 to 48 mm/yr over the catchment area) from July through September.
- Jacko Lake Seepage (JACSEEP): This station monitors releases from the Jacko Lake low-flow outlet, which is operational between July and October when lake levels are below the spillway invert. The catchment area is 41 km^2. Flows ranged between 0.000 and 0.231 m^3/s (0 to 178 mm/yr over the catchment area) from July through September.
- Peterson Creek (PETER): This station is located downstream of Jacko Lake, with a catchment area of 60 km^2, and it receives flows from all other stations. Flows can be approximated by combining flows from JACLAKE and JACSEEP. Flows ranged between 0.000 and 0.286 m^3/s (0 to 150 mm/yr over the catchment area) in August and September (data were unavailable at this station for July).
- Keynes Creek (KEYNES): This small tributary to Peterson Creek (catchment area of 11 km^2) was dry throughout the low flow period.

The locations of the above stations are shown on Drawing 05 of BGC [2015a].

The JACINF station (located about 1 km upgradient from the southwest arm of Jacko Lake) is considered to be most representative of existing, unregulated conditions in the LSA that can be correlated to regional flow records. Flows at the other gauge sites are subject to influence by lake outlet operation and beaver dam activity. Average flows during the baseflow period from the long-term synthetic dataset developed by Knight Piésold [2013b] for this gauging station range between 0.001 to 0.027 m^3/s (1 to 28 mm/yr over the catchment area), which has good agreement with observed 2014 flows. However, streamflows measured at JACINF are considered to represent surface and near surface (interflow) runoff only [*BGC*, 2015a]. Groundwater is measured at a depth of approximately 15 m below the ground surface in

groundwater well (MW11-08S) located immediately downstream of JACINF. This information suggests that there is no groundwater baseflow discharging to the JACINF gauge.[*BGC*, 2015a], although numerical groundwater flow modelling simulations predict some areas along Jacko Creek and Upper Peterson Creek may be net groundwater discharge zones [*BGC*, 2015d].

The KEYNES station (located approximately 200 m north east of BGC14-002D/S) was installed in March 2014 [*BGC*, 2015f]. As such, no earlier stage-discharge measurements are available to compare with measurements collected during 2014. The observation that this tributary was dry during the low flow period of 2014 suggests that there is no groundwater baseflow reporting to the KEYNES gauge. This assumption is consistent with observations at groundwater wells BGC14-002D/S, which show groundwater levels about 7 m below the surface. However, upward hydraulic gradients noted at BGC14-002D/S (see Section 7.5.2) and numerical groundwater flow modelling simulations [*BGC*, 2015d] suggest that groundwater may discharge to some reaches of Keynes Creek. A summary of estimated baseflows based on observed low flows at stream gauging stations in the RSA and LSA is provided in Table 13.

9.2.2. Evapotranspiration

Potential evapotranspiration (PET) is defined as the amount of water that would evapotranspire from a crop surface if the supply of water was infinite. Monthly PET was estimated by KP [2014a] for the Mine Site using the Thornthwaite [1955] equation based on temperature records at the AJAXMET climate station. KP [2014a] also used long-term synthetic temperatures to estimate mean monthly PET values for the Mine Site. PET values for 2010, 2011 and 2012 estimated based on site data with the Thornthwaite method ranged from 524 to 584 mm/yr as distributed in Table 14. Average long-term estimates based on site data suggest that PET ranges from 0 mm in December and January to 130 mm in July (Table 14). Use of the long-term synthetic temperature series produced an average annual estimate of PET of 586 mm/yr, ranging from 0 mm in December and January to 130 mm/yr in July, consistent with estimates from site data (Table 14)

9.2.3. Groundwater Abstraction

There are various potential sources of groundwater abstraction within the RSA that require consideration in the groundwater budget. These include, but may not be limited to:

- Dewatering in Aberdeen through the DWMS
- Residential use from groundwater wells (potable and irrigation use)
- Irrigation and livestock watering from groundwater wells.

9.2.3.1. Aberdeen Dewatering and Monitoring System (DWMS)

In order to maintain low piezometric pressures in critical areas for slope stability, the City operates a dewatering system consisting of “more than 30” groundwater dewatering wells in the Aberdeen area [City of Kamloops, 2008]. The City has also required the installation of sub-

drains with the construction of new lots to limit infiltration to the groundwater system. The modelling studies of Golder [2008c] indicate that DWMS removes groundwater at a rate on the order of 70 m^3/day. The amount of infiltrating water intercepted by sub-drain systems was not known at the time of this study, but presumably is accounted for in net infiltration/recharge numbers used by Golder in their modelling.

9.2.3.2. Residential Well Use

As noted in Section 6.1, there are 267 registered water wells used for domestic purposes within the RSA. Per capita household water use in Canada is estimated to be about 343 L/day [Environment Canada, 2013]; estimates available for British Columbians indicate usage of about 490 L/day [*BC MOE*, 2013a] and the City of Kamloops estimates per capita water use at about 800 L/day [*City of Kamloops*, 2013b]. Average persons per household in British Columbia is 2.5 [Statistics Canada, 2011]. Usage of 343 L/day per person times 2.5 persons per household results in an estimated usage of 860 L/day (0.86 m^3/day) per household for Canadians. Similarly, 800 L/day per person for Kamloops times 2.5 persons per household results in an estimated usage of 2,000 L/day (2.0 m^3/day) per household for Kamloops residents.

If it is assumed that all registered domestic water wells are used to supply one household, domestic water use in the RSA is estimated to range from 230 to 534 m^3/day (i.e., based on 267 domestic wells within the RSA).

Using the same methodology described above, domestic water use is estimated between 60 and 140m^3/day (i.e., based on a total of 70 domestic wells within the LSA (Appendix E)) within the LSA. The ranges in groundwater extraction estimated for mapped aquifers within the LSA are as follows:

- Between 5 and 12 m^3/day from the Sugarloaf Hill bedrock Aquifer
- Between 9 and 20 m^3/day from the Knutsford bedrock Aquifer
- Between 7 and 16 m^3/day from the Davidson Creek sand and gravel Aquifer
- Between 5 and 12 m^3/day from the Peterson Creek sand and gravel Aquifer.

These values are summarized in Table 15 together with ranges estimated for the remaining aquifers in the RSA[9].

It is noted that many of these wells are located within the limits of the City's municipal water supply (Drawing 02). The above ranges in estimates therefore represent upper limits for domestic groundwater extraction, as many residents could also make use of the City's water supply.

[9] Note that not all domestic wells in the LSA and RSA are located within aquifers mapped by the MOE.

9.2.3.3. Irrigation and Livestock Watering

As noted in Section 6.0, there are 6 wells that are documented to be used for irrigation within the RSA; none of these wells fall within the LSA boundaries (Appendix E). It is assumed that these wells also supply water for livestock watering. Beef cattle require about 45 L/day and dairy cattle require about 135 L/day. Ranching is primarily beef cattle.

10.0 CONCEPTUAL HYDROGEOLOGIC MODEL

10.1. Overview

Based on the data reviewed above, a conceptual hydrogeologic model has been developed for the area. A schematic of the conceptual hydrogeologic model is shown on Figure 20.

The topography of the RSA ranges from an elevation of approximately 1,900 m asl at Chuwhels Mountain, approximately 20 km southwest of the planned pit, to about 340 m asl at Kamloops Lake / Thompson River, approximately 7 km north of the planned pit (Drawing 02). Thus, overall topographic relief is approximately 1,600 m.

The region has a semi-arid steppe climate (Section 4.3). Precipitation is limited, especially at lower elevations, and evaporation rates are high [*KP*, 2014a]. Therefore, groundwater recharge rates are relatively low. Groundwater recharge rates are interpreted to be less than 10 mm/year as a regional average [*Golder*, 2008c]. Groundwater recharge is primarily from infiltration of precipitation and snowmelt in uplands, irrigation and leaking pipes in developed areas, with lesser components supplied by surface water infiltration at ponds, lakes, creeks, and gullies, where groundwater elevations are below creek beds. Groundwater discharge zones are generally restricted to streams, rivers and seeps that often occur at breaks in slope. A significant amount of groundwater discharge is interpreted to occur along valley bottoms and depressions particularly where the water table is close to ground surface (i.e., evapotranspiration). Flowing artesian conditions have been encountered during drilling below or near upland areas; wells installed in these areas are sealed and capped to prevent artesian flows at surface. Groundwater intercepted by the abstraction system to maintain slope stability in Aberdeen is discharged to the City of Kamloops storm sewer system and has been conceptualized as a groundwater sink in the RSA.

10.2. Hydrogeology of Surficial Deposits

Quaternary glacial and post-glacial deposits of variable thickness (i.e., from less than 5 m to 120 m thick) comprise the surficial materials of the RSA. The Cordilleran ice sheet that covered the RSA between 10,000 to 13,000 years ago decayed by regional stagnation, depositing a thin till blanket in uplands (5 to 15 m thick near the Mine Site) and thicker (up to 80 m near the Mine Site) accumulations of permeable glaciofluvial and low-permeability glaciolacustrine sediments (i.e., diamicton) into valleys and former bedrock troughs. These thicker accumulations of glaciofluvial/glaciolacustrine sediment occur in the present-day Peterson Creek valley and other low lying areas throughout the RSA, and comprise the main sand and gravel aquifers mapped by the BC MOE within the LSA (e.g., Peterson Creek and Davidson Creek Aquifers). These aquifers are conceptualized as highly heterogeneous due to their complex depositional history, which is evidenced by laterally discontinuous stratigraphy over short distances (i.e., less than 10 m near the Project). The Peterson Creek Aquifer itself is best conceptualized as an unconfined and/or discontinuously confined, heterogeneous, channel aquifer bounded by lower hydraulic conductivity materials and some form of leakage

(e.g., recharge from an overlying saturated lower permeability unit, or from an underlying bedrock aquifer, or both [*BGC*, 2015g].

Post-glacial sediments mapped within the RSA consist of lacustrine, fluvial, eolian, colluvial and bog/organic deposits. Post-glacial materials are generally restricted to the Kamloops Lake / Thompson River area, and Campbell Creek, although occurrences of all deposits have been mapped around the Mine Site. An area of bedded gypsum referred to as “gypsum spring” by Golder [2008c] within Aberdeen includes an assemblage of swelling clays/bentonite and montmorillonite, which is inferred to have developed due to alteration of tills along the contact with the underlying bedrock in this area [*Golder*, 2008c].

Surficial materials within areas of the RSA that have been modified by human activity (e.g., gravel pits, construction fill, historic mine rock and tailings areas, and mining haul roads) have been classified as “anthropogenic” materials. These include areas around the Mine Site, Aberdeen, the New Afton Mine and the City of Kamloops.

10.3. Bedrock Hydrogeology

The bedrock within the RSA consists of the low permeability Triassic Nicola Group (volcanics, volcaniclastics, and picrite); the Late Triassic to Early Jurassic Iron Mask Batholith (dioritic intrusive rocks); and the Eocene Kamloops Group (volcanics and sedimentary rocks). The moderately permeable Kamloops Group overlies the Nicola Group and can be greater than 250 m thick in the RSA. The sub-horizontal deposition of Kamloops Group rocks may impart a layered characteristic giving it a macroscale anisotropy, potentially magnified by the presence of swelling clays in localized areas (i.e., as mapped in Aberdeen and noted above). The Iron Mask Batholith is a composite dioritic intrusion that includes phases known as the Iron Mask Hybrid (IMH) and Sugarloaf Diorite (SLD) near the Mine Site. The SLD occurs in faulted contact with the Nicola Group and IMH near the Mine Site. Serpentinized picritic basalts occur as wedges or slivers in major fault-related structural corridors within the Batholith. Picrite zones are typically weaker and more altered than surrounding rocks, and could potentially provide a conduit for enhanced localized groundwater flow where the unit is encountered.

Numerous fault systems have been noted within the RSA. These include the major basement faults of the Nicola Group and younger faults within the Iron Mask Batholith. The Edith Lake Fault Zone (ELFZ) is a regionally mapped northwest-southeast trending structure to the south of the Mine Site. Based on recent investigations being completed concurrent with the preparation of this report, the ELFZ exhibits locally higher hydraulic conductivity compared to the surrounding country rock within the LSA. The Hugh Allen and Versatile faults in the Aberdeen area have also been identified by others as hydrogeologically significant, potentially acting as barriers to northward groundwater flow and contributing to the development of upward hydraulic gradients observed within the some areas of the subdivision [*Golder*, 2008c].

Shallow bedrock (i.e., up to approximately 200 m) deep is interpreted to be heterogeneous, with hydraulic conductivity influenced by rock type, weathering, faults, joints, and fractures. Shallow bedrock zones of higher hydraulic conductivity form part of the active (intermediate)

groundwater flow systems in the region. Deeper bedrock (i.e., greater than 200 m deep) is generally of low hydraulic conductivity due to less weathering, higher confining stresses that close joints and fractures, combined with the rock types that occur in the region.

10.4. Groundwater Flow Conditions

The potentiometric surface (water table) is interpreted as a subdued replica of topography, with depths to groundwater typically being greater in the uplands than in local valleys or the Thompson River valley. Groundwater flow is generally directed from south to north from Chuwels Mountain to Kamloops Lake / Thompson River, but with local variations due to topography and geological conditions.

The ridge system that trends northwest-southeast and located immediately north of the Mine Site is interpreted to coincide with a groundwater divide between northward (i.e., towards Aberdeen) and southward (i.e., towards the Mine Site) flowing groundwater. Project-scale groundwater flow is predicted to be dominated by shallow groundwater flow primarily within glacial sediments. Principal discharge zones near the Mine Site include reaches of Peterson Creek, Goose Lake/Edith Lake and Jacko Lake, the existing Ajax West Pit lakes as well as other local ephemeral streams, sloughs and ponds.

Near the Mine Site, groundwater converges locally towards the existing Ajax West Pits. Groundwater also converges towards the topographic saddle that occurs near the confluence of Peterson Creek with Jacko Lake, and then flows either northwestward from Jacko Lake beyond the Mine Site, or eastward following the Peterson Creek drainage.

Seasonal fluctuations in groundwater levels at the Mine Site range from less than 0.1 m to approximately 4 m, annually. Groundwater elevations monitored near the Mine Site typically decline through the winter and spring (i.e., September to March), and are highest during the summer and fall quarter (i.e. June to September). The seasonal variation in groundwater levels is consistent with climatic trends. Some monitoring locations near the Mine Site also show rapid water level recoveries (i.e., within a month) following precipitation events. These locations are interpreted to receive localized sources of recharge due to higher permeability near surface sediments or fractured bedrock. Groundwater at locations where groundwater levels appear to reach seasonal maxima in September or October likely receive recharge from more distant sources in addition to delayed infiltration from surface recharge caused by near surface lower permeability sediments.

10.5. Groundwater Flow Systems

Three types of groundwater flow systems are interpreted within both the RSA and the LSA based on the hydrogeological conditions:

1. Shallow (localized) groundwater flow system.
2. Intermediate groundwater flow system.
3. Regional groundwater flow system.

Each groundwater flow system and the interaction between the systems is described below.

10.5.1. Shallow Groundwater Flow System

Shallow groundwater flow systems are expected to be found throughout the RSA and LSA. Their presence is interpreted to be a function of the local topography, underlying geological/hydrogeological conditions and magnitude/distribution of recharge/discharge conditions. The shallow flow systems are thought to exist primarily within the Quaternary deposits and shallow fractured bedrock, particularly where there are relatively large changes in topography over short distances. The topographic relief may result in several hydraulically separated shallow groundwater flow systems within a localized area defined by shallow water table divides or stream channels. This condition is observed locally within the TSF, EMRSF and SMRSF and to the north of Jacko Lake where there are drainages that appear to receive localized recharge and boreholes indicate locally flowing conditions. In general, shallow groundwater flow is interpreted to be restricted to depths of less than 30 m, but in some cases (e.g., within the Peterson Creek Valley) the system may reach up to 80 m. Groundwater flow paths in the shallow groundwater flow system are interpreted to be on the order of a few tens to several hundreds of metres.

Groundwater recharge occurs from snowmelt in the spring and early summer as evidenced by the annual rise in groundwater levels at the Mine Site. Infiltration and recharge is conceptualized to be greatest in areas underlain by the more permeable glacial fluvial sediments and fractured bedrock, with less recharge in areas underlain by glacial till and glaciolacustrine sediments. This is supported by monitoring data from the Mine site, which typically show greater and faster increases in groundwater levels in the spring within shallow wells completed in glaciofluvial sands or fractured shallow bedrock. Similarly, a lesser and attenuated rise in groundwater levels is typically observed with increasing depth of monitoring well completion, and a more subdued hydrograph is observed in areas where low-permeability glacial till is present at or near the surface.

Recharge is estimated in the range of 0.3 to 8 mm/yr. In the upper reaches of the LSA and RSA, the streams are often losing surface water to groundwater, providing an additional source of recharge to the groundwater system. Localized recharge and discharge may occur along stream segments driven by local stream gradients (topography) and the underlying geological conditions (thickness and permeability of glacial sediments).

Some groundwater from the shallow flow system may move under downward components of hydraulic gradients to the underlying intermediate and regional groundwater flow systems. The greatest component of vertical flow to the deeper groundwater flow systems is conceptualized to be in the upper elevations of the drainage basins in the RSA and LSA.

Discharge from the shallow groundwater flow system occurs primarily to streams and creeks as baseflow, and as shallow evapotranspiration where the water table is close to ground surface. Groundwater discharge to small lakes from within localized topographic basins may

result in salt crust development and saline water bodies if the lake evaporation rate exceeds groundwater recharge and runoff within the localized basin.

The underlying intermediate groundwater flow system may discharge (through vertical leakage) to the deeper sections of the shallow groundwater flow system – for example in the lowest elevation sections of the Peterson Creek Aquifer or to the shallow flow system feeding Jacko Lake. Local flowing artesian conditions within monitoring wells are observed in lower lying regions near the southeast extent of the TSF.

Groundwater quality results from studies completed by KP at the Mine Site suggest that there is a correlation between water quality results and sampling location along a groundwater flowpath. The results of this study indicate that groundwater from monitoring wells installed at lower elevations such as sloughs and creeks tended to be enriched in TDS and sulphate compared to wells installed at higher elevations or in upper reaches of local catchments. KP [2015b] interpreted this signature to potentially be indicative of the length of time groundwater interacts with lithological units along a flow pathway, where sulphate and TDS enrichment occurs with increasing proximity to local discharge zones. This interpretation is consistent with the shallow flow system characterization conceptualized for the Mine Site.

10.5.2. Intermediate Groundwater Flow System

The intermediate groundwater flow system is thought to exist primarily within the upper 200 m of bedrock within more permeable fractured and faulted zones (Figure 04). Flow paths within the intermediate groundwater flow system are interpreted to be on the order of hundreds of metres to several kilometres. The system is recharged by vertical leakage from the overlying shallow groundwater flow system where surficial deposits are present. Where there are little to no surficial deposits overlying bedrock, then recharge can occur directly to the bedrock.

The intermediate groundwater flow system is conceptualized to discharge either to the deeper regional flow system or to the overlying shallow groundwater flow system in areas where upward vertical components of groundwater flow develop. These conditions may include discharge to the Peterson Creek Aquifer, Jacko Lake, Humphrey Creek, and potentially discharge via the ELFZ. The degree of vertical groundwater flow within the intermediate groundwater flow system is a function of the local hydraulic conductivity and local hydraulic gradients.

10.5.3. Regional Groundwater Flow System

The regional groundwater flow system is conceptualized as deep (i.e., greater than 200 m) with flow paths on the order of kilometres to tens of kilometres. Regional flow is conceptualized to be very slow compared to shallow and intermediate flow systems due to the passage of groundwater through deeper bedrock of lower hydraulic conductivity. Groundwater divides within the regional flow system are interpreted to coincide with local and regional topographic divides, which include a north-south trending divide to the west of the New Afton Mine Site, a

northwest-southeast trending divide just north of the Mine Site, and an east-west trending divide to the east of the LSA (Figure 05). Groundwater discharge from the regional flow system is generally to Kamloops Lake/Thompson River.

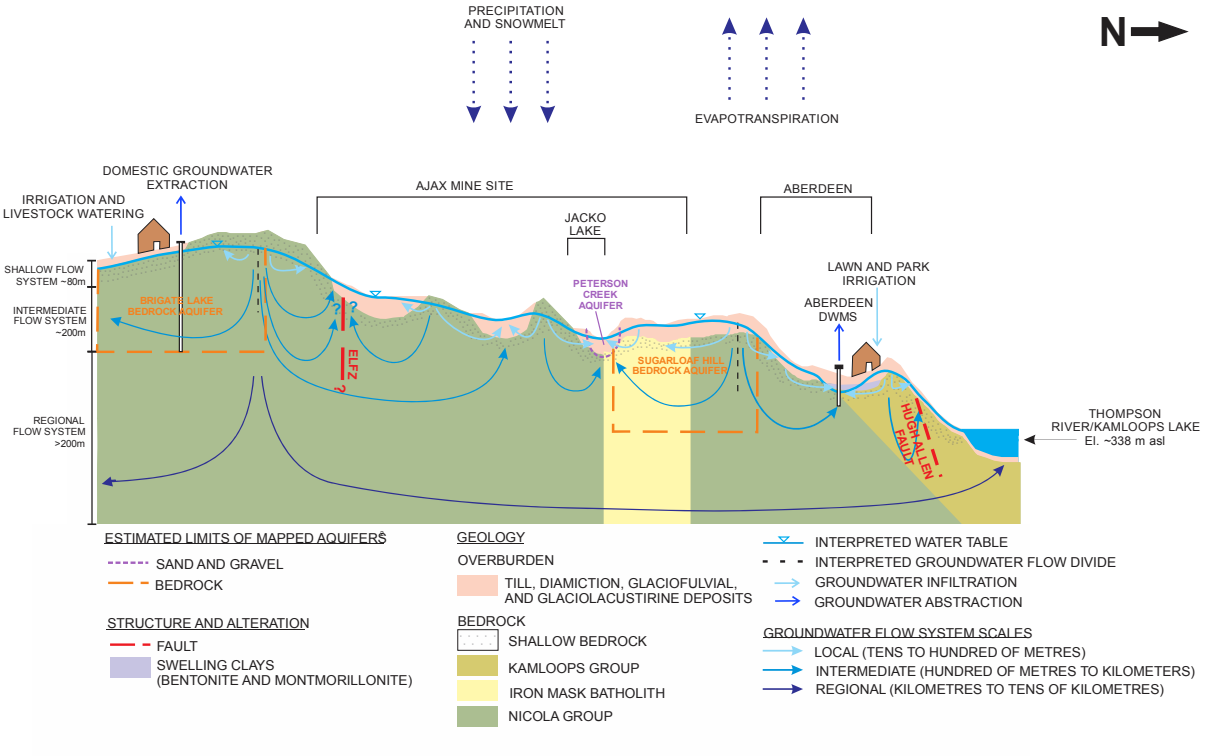


Figure 20. Conceptual Hydrogeologic Model.

Notes:

1. Drawing is schematic and not to scale. Limits of bedrock aquifers estimated based on WRBC mapped limits and maximum practical depth of groundwater abstraction in registered water wells (approximately 200m)
2. ELFZ = Edith Lake Fault Zone; Aberdeen DWMS = Dewatering and Monitoring System.
3. The Hugh Allen fault is interpreted as a groundwater flow barrier by Golder (2008a).

11.0 CONCLUDING SUMMARY

The baseline hydrogeologic conditions and related datasets near the Ajax Mine Site (LSA) and surrounding region (RSA) are summarized in this report. The report describes the physiography, geology, groundwater resources, physical hydrogeologic setting, groundwater quality, groundwater budget and conceptual hydrogeologic model based on the compilation and interpretation of existing available data. This baseline assessment will support the provincial Application (the Application) for an Environmental Assessment (EA) Certificate and the federal Environmental Impact Statement (EIS) for the Ajax Project. This assessment also provides the conceptual basis for the development of the numerical groundwater flow model being completed to support the Application/EIS [*BGC*, 2015d].

The Project is located within an area that contains groundwater resources used by several different user groups. Five (5) aquifers mapped by the MOE fall within the LSA. These include the Sugarloaf Hill (No. 0276) and Knutsford (No. 0275) bedrock Aquifers, part of the Brigade Lake (No. 0274) bedrock Aquifer, and the Davidson Creek (No. 0277) and Peterson Creek (No. 0278) sand and gravel Aquifers. A total of 38 registered wells are interpreted to extract groundwater from aquifers within the LSA for domestic purposes. The reported yields for the majority of these wells are 1 L/s or less. The Peterson Creek Aquifer is located directly south of the existing Ajax West and East Pits. There are a total of seven wells within this aquifer with reported yields that are less than 2 L/s.

Surficial materials in the RSA are comprised of glacial and post-glacial deposits consisting primarily of discontinuous glacial till, with occasional sand and gravel hummocks. Lacustrine silts and clays are common in valley bottoms. Surficial materials have been grouped into glaciofluvial/fluvial, glacial till, glaciolacustrine/lacustrine, mine rock and colluvium hydrostratigraphic units based on geologic provenance, available drill hole, test pit and mapping data.

The glaciofluvial/fluvial hydrostratigraphic unit consists of glacial sand and gravel complexes and post-glacial fluvial deposits. The connectivity of hydraulically conductive gravels within these deposits could be limited due to their complex depositional history. Variable states of aquifer confinement throughout the fluvial/glaciofluvial unit are conceptualized due to layering and heterogeneity. This hydrostratigraphic unit includes the mapped Peterson and Davidson Creek Aquifers near the Mine Site. The Peterson Creek Aquifer is conceptualized as an unconfined and/or discontinuously confined, heterogeneous, channel aquifer bounded by lower hydraulic conductivity materials and some form of leakage (e.g., recharge from an overlying saturated lower permeability unit, or from an underlying bedrock aquifer, or both.

Bedrock has been divided into Nicola Group, Picrite, Iron Mask Hybrid, Sugarloaf Diorite and Kamloops Group hydrostratigraphic units consistent with mapped and modelled geology. The mapped Sugarloaf Hill bedrock Aquifer is included with the Iron Mask Hybrid unit and the mapped Knutsford bedrock Aquifer is included in the Kamloops Group unit. The sub-horizontal

deposition of Kamloops Group could impart a layered characteristic giving it a macroscale anisotropy.

Available hydraulic conductivity (K) data indicate that, within surficial materials, fluvial/glaciofluvial sands and gravels are generally the most conductive, and glacial till deposits are the least conductive. The distribution of K data in bedrock suggests that the bedrock hydrostratigraphic units may be ordered from most to least conductive as follows: Kamloops Group, Iron Mask Hybrid, Picrite, Sugarloaf Diorite, Nicola Group.

There is a general trend of decreasing K with depth within the LSA, where below approximately 200 m bgs, bedrock K is typically less than 1×10^{-8} m/s. This suggests a potential for a separation of groundwater flow systems, with groundwater flow most active within surficial deposits and shallow bedrock, particularly within aquifer complexes comprising the fluvial/glaciofluvial hydrostratigraphic unit.

Estimates of specific storage for the various units vary by material type and include values calculated from the results of pumping tests and slug tests near the Mine Site. Specific storage estimates reported in this assessment were augmented by calibrated results from a companion numerical groundwater flow model being completed for the Project EA.

Alteration zones and geologic faults of potential hydrogeologic significance include swelling clays/bentonite and the Hugh Allen and Versatile faults in Aberdeen, and serpentinized picrite and the Edith Lake Fault Zone (ELFZ) near the Mine Site. The swelling clays in Aberdeen are susceptible to instability when groundwater pressures are raised due to development-related recharge [*Golder*, 2008c]. The Hugh Allen and Versatile faults have been interpreted to act as barriers to groundwater flow, contributing to local flowing artesian conditions [*Golder*, 2008c].The serpentenized picrite has been noted to be weaker and more altered than adjacent rocks and is considered to be a unique hydrostratigraphic unit in this assessment.

Results of drilling investigations suggest a potentially locally enhanced K (i.e., up to at least two orders of magnitude) within the ELFZ compared to the surrounding country rock. This suggests that a local groundwater flow conduit along strike of the ELFZ may be present. Slight upward vertical components of hydraulic gradients based on potentiometric data collected around the zone of faulting suggest that groundwater may flow towards the ELFZ (i.e. may preferentially flow or drain towards the ELFZ). Several interpretations are plausible for the structural orientation and thickness of the ELFZ. Therefore, some uncertainty remains on the interpretation of the extent, thickness, hydraulic properties and orientation (dip and dip direction) of ELFZ; however, in all cases the ELFZ is interpreted to have a dip that is near vertical.

Annual fluctuations in groundwater levels near the Mine Site range from less than 0.1 m to approximately 4 m. Groundwater elevations typically decline through winter and spring (i.e., September to March), and are highest during the summer and fall quarters (i.e., June to September). There appears to be a relationship between the annual rise in groundwater levels with near-surface geological conditions. A lesser and attenuated rise in groundwater levels is

observed with increasing depth of monitoring well completion although a more subdued hydrograph is also observed in areas where low-permeability glacial till is present at or near the surface. A greater and faster increase in groundwater levels in the spring is typically observed within wells completed in glaciofluvial sands or fractured shallow bedrock.

Some monitoring locations near the Mine Site show rapid water level recoveries following precipitation events and are interpreted to receive localized sources of recharge due to hydraulic connections to surface. Most wells showing this behaviour are located around the perimeter of the planned open pit to the north of Peterson Creek and are screened within till, fluvial or glaciofluvial materials or shallow bedrock. Other wells showing this behaviour are located around the perimeter of the TSF and screened within colluvium, till or shallow bedrock.

Vertical hydraulic gradients calculated from groundwater monitoring data collected near the Mine Site are generally directed downward. Upward directed hydraulic gradients are located in local depressions or low areas adjacent to local topographic highs and within faulted bedrock in the ELFZ suggesting potential groundwater discharge near these locations. Local flowing artesian conditions are observed in some wells installed in the lower lying region that extends from the north arm of Jacko Lake and in topographic depressions around the WMRSF, TSF and SMRSF footprints. Both downward and upward hydraulic gradients were noted within well pairs installed along Lower Peterson Creek suggesting that there may be gaining and losing reaches along the water course.

Groundwater quality near the Mine Site was characterized by KP as alkaline, hard to very hard and high in total dissolved solids (TDS), with sodium-sulphate, magnesium-sulphate, or sulphate as the major water types. Weakly dominant cations noted by KP included sodium (from deep monitoring wells near the Open Pit and west and north of Jacko Lake), magnesium (in shallower wells within and located east and southeast of the Open Pit) and calcium (from wells located between Jacko Lake and the existing Ajax West pits).

Elevated trace metals and metalloids identified by KP included arsenic, boron, manganese, molybdenum and selenium. KP noted that trace metal and metalloid concentrations did not correlate well with major ions, and that their distribution was more strongly influenced by local geological enrichment in specific minerals and by proximity to the Open Pit area.

KP also indicated that water quality signatures were not distinct for specific bedrock or surficial lithological units near the Mine Site, but were more easily distinguished by location and proximity to potential groundwater recharge and discharge zones. KP noted that groundwater from monitoring wells installed at lower elevations such as sloughs and creeks tended to be enriched in TDS and sulphate compared to wells installed at higher elevations or in upper reaches of local catchments. KP interpreted this to potentially reflect the length of time groundwater interacts with lithological units along a flow pathway, where sulphate and TDS enrichment occurs with increasing proximity to local discharge zones.

The water table configuration in the RSA is interpreted as a subdued replica of topography, with depths to groundwater typically being greater in the uplands than in topographic lows.

Shallow (localized), intermediate and regional scale groundwater flow systems are interpreted to exist throughout the RSA and LSA.

The presence of shallow scale flow systems is interpreted to be controlled by local topography, near-surface geology/hydrogeology and the magnitude and distribution of groundwater recharge and discharge zones. Shallow scale flow systems are interpreted to be active predominantly within the quaternary deposits and shallow fractured bedrock (i.e., 30 m deep on average, but up to 80 m in some cases such as within the Peterson Creek valley). Groundwater flow paths in the shallow scale flow system are conceptualized to be on the order of a few tens to several hundred metres, with recharge from infiltration of precipitation and snowmelt predominantly in upland areas and through more permeable glacial fluvial sediments. Shallow groundwater is interpreted to discharge to streams, creeks and to small lakes from within localized topographic basins. Shallow groundwater is also interpreted to discharge as evapotranspiration where the water table is near the ground surface.

Intermediate scale groundwater flow is conceptualized to occur primarily within the upper 200 m of bedrock within faulted and fractured zones. It is conceptualized to be recharged primarily by vertical leakage from the shallow flow system. The intermediate flow system may discharge either to the deeper, regional flow system or to the shallow groundwater flow system in areas where upward vertical components of groundwater flow develop. (i.e., potentially to the Peterson Creek Aquifer, Jacko Lake, Humphrey Creek or via the ELFZ). Groundwater flow paths in the intermediate system are conceptualized to be on the order of hundreds of metres to several kilometres.

The regional groundwater flow system is conceptualized as deep (i.e., greater than 200 m) with flow paths on the order of kilometres to tens of kilometres and is recharged by the intermediate system. It is interpreted to be slow compared to shallow and intermediate systems due to the lower hydraulic conductivity of deeper bedrock. The regional system generally discharges to the Thompson River/Kamloops Lake, but may be intercepted by deep-seated fault zones (such as the ELFZ) to convey groundwater towards the overlying intermediate and shallow systems.

Groundwater divides within the RSA are interpreted to coincide with local and regional topographic divides, which include a north-south trending divide to the west of the New Afton Mine site, an east-west trending divide to the east of the LSA and a northwest-southeast trending divide just north of the Mine Site. The interpreted groundwater divide to the north of the Mine Site is interpreted to separate northward (i.e., towards Aberdeen) and southward (i.e., towards the Mine Site) local scale flow systems. Groundwater data collected to date in the project area support this assumption, suggesting that local groundwater flow in the project area could be separate from the local groundwater flow system in Aberdeen.

12.0 CLOSURE

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REFERENCES

Armstrong, J. E., and R. J. Fulton (1965), Day 11 and Day 12 in Guidebook for Field Conference j Pacific Northwest INQUA, VIIth congress, USA pp 87-105.

BC MOE (1980), Jacko Lake Reservoir General Plan, Longitudinal Section and Cross Sections of Dam. Inventory 0302080-23, Drawing No. 4613-9A. Inventory and Engineering Branch.

BC MOE (2013a), Living Water Smart - British Columbia's Water Plan. http://livingwatersmart.ca/didyouknow.html.

BC MOE (2013b), Framework for a Hydrogeologic Study in support of an Application for an Environmental Assessment Certificate under the Environmental Assessment Act and Regulations. BC Ministry of Environment, Water Protection and Sustainability Branch. http://www.env.gov.bc.ca/wsd/plan_protect_sustain/groundwater/library/envass.html.

BC MOE (2014), Water Stewardship Division. BC Water Resources Atlas (WRBC) http://www.env.gov.bc.ca/wsd/data_searches/wrbc/ (accessed November, 2014).

BGC (2011a), Ajax Project Mine Site Infrastructure Foundation Report - Access Road, Plant Site, Truck Shop, Ore Crusher and Explosives Storage. Report prepared by BGC Engineering Inc. for Abacus Mining and Exploration Corporation, dated August 4, 2011, Doc. No.:0712-003-R02-2011.

BGC (2011b), Ajax Project Feasibility Study - Open Pit Geotechnical and Hydrogeological Assessments. Report prepared by BGC Engineering Inc. for Abacus Mining and Exploration Corporation, dated November 10, 2011, Doc. No.:0712-003-R03-2011.

BGC (2011c), Ajax Project Feasibility Study - Prototype Dewatering Well and Pumping Test. Report prepared by BGC Engineering Inc. for Abacus Mining and Exploration Corporation, dated September 10, 2011, Doc. No.:0712-003-M01-2011.

BGC (2011d), Ajax Project Feasibility Study - Plant SIte, Waste Rock Storage Areas, Crushers and Explosives Storage Geotechnical Investigation: Data Report. Report prepared by BGC Engineering Inc. for Abacus Mining and Exploration Corporation, dated July 28, 2011, Doc. No.:0712-003-R01-2011.

BGC (2012a), MEMA Support Cost Estimate (Rev.1), Proposal prepared for KGHM Ajax Mining Inc., Dated December 21, 2012.

BGC (2012b), Summary of Reconnaissance Activities and Proposal for Baseline Groundwater Monitoring - Ajax Project. Memorandum prepared by BGC Engineering Inc. for KGHM Ajax Mining Inc., Dated November 21, 2012.

BGC (2013a), Instrumentation for Baseline Groundwater Monitoring [draft]. Memorandum prepared for KGHM Ajax Mining Inc., Dated June 14, 2013.

BGC (2013b), Ajax Feasibility Study Update Water Management Plan. Report prepared by BGC Engineering Inc. for KGHM Ajax Mining Inc., dated June 20, 2013.

BGC (2013c), Ajax Copper/Gold Project - Baseline Groundwater Hydrology Assessment Final Report. Report prepared by BGC Engineering Inc. for KGHM Ajax Mining Inc., June 28, 2013, 363p.

BGC (2014a), Ajax Project Screening Level Assessment – Groundwater Modelling Results. Memorandum prepared by BGC Engineering Inc. for KGHM Ajax Mining Inc., Dated July 14, 2014, 69p.

BGC (2014b), Ajax Project EA – Interim Results and Revision to ELTF Investigation Work Scope. Memorandum prepared by BGC for KGHM Ajax Mining Inc., dated November 3, 2014.

BGC (2015a), Ajax Project - Water Balance Model - DRAFT. Report prepared by BGC Engineering Inc. for KGHM Ajax Mining Inc., dated March 31, 2015.

BGC (2015b), Ajax Project EA - Edith Lake Fault Zone Investigation and Characterization Report. Report prepared by BGC Engineering Inc. for KGHM Ajax Mining Inc., Dated June 2015.

BGC (2015c), Ajax Project EA – Mine Rock and Tailings Sand Infiltration HYDRUS 1D Modelling - DRAFT. Memorandum Prepared by BGC Engineering Inc. for KGHM Ajax Mining Inc.. Dated July 28, 2015.

BGC (2015d), Ajax Project Environmental Assessment - Numerical Groundwater Flow Model - FINAL. Report prepared by BGC Engineering Inc. for KGHM Ajax Mining Inc., dated August 21, 2015, Doc. No.: 1125-007-R04-2015.

BGC (2015e), Ajax Project EA – 2014 Streamflow Monitoring. Report prepared by BGC Engineering Inc. for KGHM Ajax Mining Inc., dated April 9, 2015, Doc. No.: 1125-007-R01-2015.

BGC (2015f), Ajax Project EA – Ajax South Groundwater and Surface Water Site Investigation. Memorandum prepared by BGC Engineering Inc. for KGHM Ajax Mining Inc., dated August 26, 2015, Doc. No.:1125-007-M03-2014

BGC (2015g), Ajax Project EA – Peterson Creek Aquifer Pumping Test. Report prepared by BGC Engineering Inc. for KGHM Ajax Mining Inc., dated July 31, 2015, Doc. No.:1125-007-M01-2015.

Brennand, T. A., and O. B. Lian (2009), Cordilleran ice sheet dynamics and decay, and postglacial landscape adjustment in southern Interior British Columbia. CANQUA 2009 Pre-conference Field Trip. April 20-May 2, 2009.

Campbell, K. V. (2011), Structural Review of Ajax East and Ajax West Deposits. Ajax Project - Kamloops Mining Division, B.C., Report Prepared by ERSI Earth Resource Surveys Inc. for BGC Engineering Inc., Dated March 15, 2011.

Campbell, K. V. (2014), Edith Lake Thrust Fault Investigation. Ajax Project - Kamloops Mining Division, B.C., Report Prepared by ERSI Earth Resource Surveys Inc. for BGC Engineering Inc., Dated October 2014.

CEA Agency (1999), Cumulative Effects Assessment Practitioners Guide. Prepared by The Cumulative Effects Assessment Working Group and AXYS Environmental Consulting Ltd.

Chanasyk (2000), Report on Irrigation to City of Kamloops.

City of Kamloops (2008), Aberdeen Groundwater Area Information Summary, City of Kamloops Current to: 2008 December 31, Available at: http://www.kamloops.ca/development/pdfs/08-AberdeenGroundwaterSummary.pdf Accessed: February 2013.

City of Kamloops (2012), Aberdeen Hydrogeology and Geotchnical Data Compilation CD. Data provided to AME from the City of Kamloops on July 30, 2012. .

City of Kamloops (2013a), City of Kamloops Sustainable Kamloops Plan - Information Package on Water. http://www.city.kamloops.bc.ca/sustainable/pdfs/SKP-WaterBackground.pdf.

City of Kamloops (2013b), City of Kamloops Environmental Sustainability - Water. http://www.city.kamloops.bc.ca/environment/water-index.shtml.

EAO (2015), KGHM Ajax Mining Inc. (2015) Ajax Project Application Information Requirements / Environmental Impact Statement Guidelines, **June** 2015 Update, dated **June 30**, 2015.

Environment Canada (2013), Water Use. http://www.ec.gc.ca/eau-water/default.asp?lang=En&n=96F2B222-1.

Ewing, T. (1978), Geology of the Kamloops Group (92I/9,10,15,16). British Columbia Geological Survey, Geological Field Work 1978.

Fetter, C. W. (2001), *Applied Hydrogeology*, 4th ed., 598 pp., Prentice Hall, New Jersey.

Freeze, R. A., and J. A. Cherry (1979), *Groundwater*, 2nd ed., 604 pp., Prentice Hall, New Jersey.

Frontier Geosciences Inc (2014), Bathymetric and sub-bottom acoustic profiling survey, Jacko Lake, Kamloops, BC. Report prepared for KGHM Ajax Mining Inc., dated September 2014.

Fulton, R. J. (1967), Deglaciation studies in Kamloops region, an area of moderate relief, British Columbia. Bulletin 154. Geological Survey of Canada. 48 pp 4 maps.

Fulton, R. J. (1969), Glacial Lake History, Southern Interior Plateau, British Columbia, Geological Survey of Canada. Paper 69-37, 3 figures and 1 table, 22 p.

Fulton, R. J. (1975), Quaternary Geology and Geomorphology, Nicola-Vernon Area, British Columbia. Geological Survey of Canada, Memoir 380, 50p (7 sheets).

Fulton, R. J., and G. W. Smith (1978), Late Pleistocene stratigraphy of south-central British Columbia. Canadian Journal of Earth Science. Vol 15, 971-980 p.

Golder (2007), 2006 Stability Review, Aberdeen Development Area, Kamloops, BC, *Report prepared by Golder Associates Ltd. for the City of Kamloops, dated September 21,2007*.

Golder (2008a), Addendum I to Regional Scale Hydrogeological Investigation (1998 - 2000): Local Scale Groundwater Flow Model, Aberdeen Development Area, Kamloops, BC, *Report prepared by Golder Associates Ltd. for the City of Kamloops, dated October 24, 2008*.

Golder (2008b), Risk Management Plan, Aberdeen Ground Stability, Kamloops, BC, *Report prepared by Golder Associates Ltd. for the City of Kamloops, dated May 13, 2008*.

Golder (2008c), Hydrogeological Investigation (1998 - 2000) Aberdeen Area, Kamloops, BC, *Report prepared by Golder Associates Ltd. for the City of Kamloops, dated September 25, 2008*.

Golder (2008d), Addendum II to Regional Scale Hydrogeological Investigation (1998 - 2000): Evaluation of Impacts of Additional Recharge in the New Development Area on Area B and Perimeter Areas of Aberdeen, *Report prepared by Golder Associates Ltd. for the City of Kamloops, dated October 24, 2008*.

Golder (2011a), Ajax Copper/Gold Project – Factual Report on the Geotechnical Investigation for the Tailings Storage Facility, Tailings Storage Facility Pond and Thickened Tailings Plant Areas. Report prepared for Abacus Mining and Exploration Corp., dated October 14, 2011, Doc. No. 10-9002-0032.

Golder (2011b), Ajax Copper/Gold Project – Tailings Storage Facility Feasibility Design. Report prepared for Abacus Mining and Exploration Corp., dated December 30, 2011, Doc. No. 10-9002-0032.

Golder (2011c), 2010 Aberdeen Stability Review, *Report prepared by Golder Associates Ltd. for the City of Kamloops, dated September 21,2007*.

GSC (1995), Surficial materials of Canada. Geological Survey of Canada, “A” Series Map 1880A, 1 sheet.

Healy, R. W. (2010), Estimating Groundwater Recharge. Cambridge University Press.

Holland, S. S. (1964), Landforms of British Columbia. British Columbia Department of Mines and Petroleum Resources Bulletin No. 48.

iMapBC (2013), Ministry of Forests, Lands and Natural Resource Operations GIS data. Available at: http://webmaps.gov.bc.ca/imfx/imf.jsp?site=imapbc Accessed February, 2013.

Johnsen, T. (2004), Late Glacial Lakes of the Thompson Basin, Southern Interior of British Columbia: Paleogeography and Paleoenvironment. M.Sc. Theis, Simon Fraser University. March 2004. 184 p.

Johnsen, T., and T. A. Brennand (2004), Lake-glacial lakes in the Thompson Basin, British Columbia: paleogeography and evolution. Canadian Journal of Earth Science. Vol 41. 1367-1383 p.

Keystone (2008), Afton Mine Wildlife Surveys and Terrestrial Ecosystem Mapping Report and GIS dataset. Report prepared by Keystone Wildlife Research Ltd. for Abacus Mining and Exploration Company, Dated December 2008.

Klohn-Crippen (1998), Aberdeen Hills - 1997 Stability Study *Report prepared by Klohn-Crippen for Bentall Properties Ltd., dated February 1998, 109p.*

Klohn-Crippen (2001), Aberdeen Hills - Depressurization Program Task 6 - Perimeter Study, Stage 1, *Report prepared by Klohn-Crippen for Bentall Properties Ltd., dated November 2001, 62p*.

Klohn-Crippen (2003), Aberdeen Hills - Depressurization Program - Perimeter Study, Stage 2, *Report prepared by Klohn-Crippen for Bentall Properties Ltd., dated October 2003, 42p.*

Klohn-Crippen (2004), Aberdeen Hills - Depressurization Program - 2002/2003 Stability Study, *Report prepared by Klohn-Crippen for Bentall Properties Ltd., dated December 2004, 63p.*

Klohn Crippen Berger (2013), Ajax - Jacko Lake Hydrogeology Assessment, Preliminary Hydrogeological Conceptualization - Draft Report Prepared Klohn Crippen Berger for KGHM Ajax Mining Inc., Dated October 28, 2013, 56p.

Klohn Crippen Berger (2015), Ajax Mine - Jacko Lake Hydrogeology Assessment. Prepared Klohn Crippen Berger for KGHM Ajax Mining Inc., Dated August 2015, 483p.

Klohn Leonoff (1988), Ajax Mine Project Hydrogeology Study, Report prepared by Klohn Leonoff Consulting Engineers for Afton Operating Corporation, dated May 11, 1988, 94p.

Knight Piesold (2008), Abacus Mining and Exploration Corporation, Afton Project. , *2008 Surface Water Quality Report, dated December 23, 2008*.

KP (2007), Preliminary Groundwater Investigation. Report prepared for Abacus Mining and Exploration Corp., Afton Project, dated December 17, 2007. Ref No. VA101-246/5-2.

KP (2008a), Afton Project. 2008 Surface Water Quality Report. Report prepared for Abacus Mining and Exploration Corp., dated December 23, 2008, Ref No. VA101-246/6-1.

KP (2008b), Afton Project. 2008 Groundwater Quality Report. Report prepared for Abacus Mining and Exploration Corp., dated December 23, 2008, Ref No. VA101-246/6-5.

KP (2009), Afton Project. 2008 Preliminary Hydrometeorology Report. Report prepared by Knight Piesold for Abacus Mining and Exploration Corporation, dated February 17, 2009.

KP (2011a), Hydrogeological Site Investigation Data Report. Report prepared for KGHM Ajax MIning Inc., dated February 27, 2012, Ref No., VA101-246/8-3.

KP (2011b), Ajax Project: Project Description, *Report prepared by Knight Piesold for KGHM Ajax Mining Inc., dated July 6, 2011*.

KP (2012a), Ajax Project Baseline Hydrogeology Data Summary. Letter report prepared for KGHM Ajax MIning Inc., dated May 25, 2012, Ref No., VA101-246/8-A.01.

KP (2012b), Baseline Watershed Model for Jacko Lake. Letter report prepared for KGHM Ajax MIning Inc., dated March 12, 2012, Ref No., VA101-246/8-A.01.

KP (2013a), KGHM Ajax Mining Inc., Ajax Project Baseline Water Quality Report. Report prepared for KGHM Ajax Mining Inc., Dated February 27, 2013. Doc. No.:VA101-00246/8-7.

KP (2013b), KGHM Ajax Mining Inc., Ajax Project 2012 Hydrometeorology Report, Doc. No.:VA101-246/8-8, Rev. 0.

KP (2014a), KGHM Ajax Mining Inc., Ajax Project 2014 Climatology Report, Doc. No.:VA101-246/33-1, Rev. 0.

KP (2014b), Surficial Mapping Spatial Dataset in the Ajax Project Area, provided by Knight Piesold on April 28, 2014.

KP (2014c), Ajax Project Baseline Water Quality Report [draft]. Report prepared for KGHM Ajax Mining Inc.

KP (2014d), Ajax Mine Water Management Plan. Report prepared for KGHM Ajax Mining Inc., dated November 28, 2014. Ref No. VA101-246/26-3.

KP (2015a), Ajax Project Geotechnical Report - Tailings Storage and Mine Rock Storage Facilities. Report prepared for KGHM Ajax Mining Inc., dated May 15, 2015. Ref No. VA101-246/26-11 Rev 1.

KP (2015b), Ajax Project Baseline Water Quality Report. Report prepared for KGHM Ajax Mining Inc., dated May 27, 2015. Ref No. VA101-246/31-3 Rev 0.

Kreye, R., Ronneseth, K. and Wei, M. (2013), An Aquifer Classification System for Ground Water Management in British Columbia, BC Ministro of Environment, Water Protection and Sustainability Branch. Available at: http://www.env.gov.bc.ca/wsd/plan_protect_sustain/groundwater/aquifers/Aq_Classification/Aq_Class.html Accessed January 2013. .

Kwong, Y. T. J. (1987), Evolution of the Iron Mask Batholith and its associated copper mineralization; BC Ministry of Energy, Mines and Petroleum Resources, Bulletin 77, 55 pp.

Logan, J. M., and M. G. Mihalynuk (2005), Porphyry Cu-Au deposits of the Iron Mask batholith, Southeastern British Columbia, *Geological Fieldwork 2004 – Paper 2005-1, B.C. Geological Survey*.

Logan, J. M., and M. G. Mihalynuk (2006), Geology of the Iron Mask Batholith, *Open File Map 2006-11, 1 : 25,000 scale, B.C. Geological Survey*.

Maidment, R. (1993), *Handbook of Hydrology*, 1400 pp., McGraw-Hill.

Massey, N. W. D., D. G. MacIntyre, P. J. Desjardins, and R. T. Cooney (2005), Digital geology map of British Columbia, *B.C. Ministry of Energy, Mines, and Petroleum Resources, Geological Survey Branch Open File 2005-2, Scale 1:250,000.*

http://www.empr.gov.bc.ca/Mining/Geoscience/PublicationsCatalogue/GeoFiles/Pages/2005-2.aspx.

National Air Photo Library (Ottawa) (1964), Aerial photograph A18495 #111-113. July 24, 1964, scale:1:35,000

National Air Photo Library (Ottawa) (1971), Aerial photograph A22417 #217-219. July 13, 1971, scale:1:80,000.

Owsiacki, G. (2003), Basin - MinFile No. 092INE115, British Columbia Ministry of Energy Available at: http://minfile.gov.bc.ca/Summary.aspx?minfilno=092INE115 Accessed: January 2013.

Piteau Associates (2006), Permit Level Hydrogeological Assessment for Tailings Storage Facility and Block Cave, New Afton Copper-Gold Project, Kamloops, B.C.. Report prepared for New Gold Inc. Hatch Associates, dated November 2006, Project. No.: 2807.

Read, P. B. (1998), Bedrock and Surficial Geology, Southwest Development Sector, City of Kamloops, BC., *Report prepared by Geotex Constulants Ltd. for the City of Kamloops, 39p*.

Ross, K. V. (1993), Geology of the Ajax East and Ajax West, silica-saturated alkalic copper-gold porphyry deposits, Kamloops, South-central, British Columbia. Unpublished M.Sc. thesis. The University of British Columbia, Vancouver, British Columbia, 210p.

Rutqvist, J., and O. Stephansson (2003), The Role of Hydromechanical Coupling in Fractured Rock Engineering, *Hydrogeol. J.*, *11*(7-40).

Šimůnek, J., M. Šejna, H. Saito, M. Sakai, and M. T. van Genuchten (2008), The HYDRUS-1D Software Package for Simulating the One-Dimensional Movement of Water, Heat, and Multiple Solutes in Variably Saturated Media, Version 4.0, HYDRUS Software Series 1, Department of Environmental Sciences, University of California Riverside, Riverside, California, USA, pp. 315.

Snyder, L. D., and J. K. Russell (1994), Petrology and Stratigraphic Setting of the Kamloops Lake Picrite Basalts, Quesnellia Terrane, South-Central B.C. (92I/9, 15, 16), in Geological Fieldwork 1993. British Columbia Ministry of Energy, Mines and Petroleum Resources, Geological Survey Branch, Paper 1994-1, pages 297-309.

Statistics Canada (2011), Household size, by province and territory (2011 Census). http://www.statcan.gc.ca/tables-tableaux/sum-som/l01/cst01/famil53c-eng.htm.

Stokes, W. P., Kirkham, G., Peatfield, G.R., (2007), Mineral Resource Estimate for the Ajax West Deposit, Kamloops British Columbia., Report prepared for Abacus Mining and Exploration Corp., dated May 1, 2007.

Thornthwaite, C. W. (1955), The Water Balance, *Publications in Climatology, 8, 1-104*.

Wardrop (2009), Ajax Copper/Gold Project, Kamloops, British Columbia – Preliminary Assessment Technical Report Document No. 0854610100-REP-R0001-02. http://www.amemining.com/i/pdf/2009-08-05_AjaxPATechnicalReport.pdf.

Wardrop (2012), Ajax Copper/Gold Project - Kamloops, British Columbia Feasibility Study Technical Report, *Report prepared by Wardrop, a Tetra Tech Company, AMEC Americas Limited, Knight Piésold Ltd., Golder Associates Ltd. and BGC Engineering Inc. for Abacus Mining and Exploration Corporation as a National Instrument 43-101, dated January 6, 2012, Doc. No.:1054610300-REP-R0004-02, http://www.ajaxmine.ca/pdfs/Ajax_Feasibility_Study_43-101.pdf.*

Zubel, M. (2001), Ground Water Resources of British Columbia, Chapter 10 – Ground Water Resources of the Plateaus and Highlands Ground Water Regions Copyright 2011, Province of British Columbia. Available at: www.env.gov.bc.ca/wsd/plan_protect_sustain/groundwater/gwbc/C1011_Thompson_Plateau.html Accessed: January 2013.

TABLES

Table 1. Summary of Baseline Groundwater Quantity Information Requirements in EAO (2015) and Relevant Report Sections

Information Requirement	Relevant Section/Figure/Drawing Number(s) in this Report
Identification of the location of drill holes installed as part of groundwater and geotechnical programs.	Sections 3.0 and 3.1.2; Table 2; Drawing 03.
Installation details of groundwater monitoring wells and piezometers	Table 2, Appendices A, B and C
Groundwater level measurements with an examination of seasonal fluctuations and spatial variations	Sections 3.1.3, 7.3 and 7.4; Appendix G.
Hydraulic gradients	Section 3.1.3, 7.5; Table 8; Figure 17.
Assessment of the occurrence of groundwater and pre-development rate of groundwater recharge beneath the TSF and waste rock features.	Section 9; Figure 19.
Description of the methodology, analysis and results of hydraulic testing such as falling and rising head tests.	Section 3.1.4 and 7.2; Table 3; Appendices H, I and J.
Incorporation of the regional and study area geology, including interpretation of aquifer and aquitard locations in the study area.	Section 5 and 6; Tables 5 to 7; Figures 2 to 10; Drawings 02, 04 to 08.
Characterization of the bulk hydraulic conductivity for overburden and bedrock hydrostratigraphic units (e.g., rationale and basis for defining hydrostratigraphic units that may include discrete or multiple lithologies – mapped aquifers, including Peterson Creek Aquifer) and the assignment of hydrogeologic parameters (i.e., hydraulic conductivity, porosity and storage properties) to these units.	Sections 7.1 and 7.2; Table 3; Figures 11 to 13.
City of Kamloops well data, drill logs, and other relevant QC-reviewed groundwater data.	Section 3; Appendices A to E and J.
Estimates of the rate and direction of groundwater flow.	Section 7.4; Figures 14 to 16.
Expected interaction of groundwater with surface water.	Sections 7.4 to 7.6, 9.2 and 10; Figures 17 and 18.
Review of published geology and hydrogeology reports and aerial photographs.	Sections 3 and 5; Tables 5 and 6; Drawings 04 to 07; Appendix K.
Review of soils and geologic maps and aquifer classification mapping.	Section 5 and 6; Tables 6 and 7; Figures 2 to 10; Drawings 02, 04 to 08.
Review of previous drilling/test pitting and hydraulic testing.	Section 3; Drawing 03; Appendices A, B, C and H.
Inventory of neighbouring well users and regional groundwater use (including Aboriginal users) and surface water use (water licences). (The inventory of groundwater users will include some level of ground-truthing such as verifying with local personnel about their knowledge of the area, site visit and inspection of recent air photos).	Sections 4.2 and 6, Tables 7 and 15; Figure 10; Drawing 02; Appendix E.
On site photographs.	Appendix K.
Climate data	Section 4.3; Table 4.
Review of historical mine operations and site studies (e.g., Aberdeen area studies).	Section 1.2

Table 2. Ajax Project Active Groundwater Monitorng Network

Installation ID	Installation Type	Consultant	Location	Coordinates[1]			Plunge (°)	Trend (°)	Drilled Length (m)	Completion Zone[2]		Depth to VWP (mah)[2]	Datalogger Type	Screened/Monitored Hydrostratigraphy	Hydrograph Figure No. (Appendix G)
				Northing (m)	Easting (m)	Elevation (m asl)				From (mbgs)	To (mbgs)				
BGC14-001D	Standpipe Piezometer	BGC	TSF	5,608,796	682,286	936	-	-	29.6	18.0	24.1	-	Solinst Levelogger Model 3001 M10/F30	Nicola Volcanics	1
BGC14-001S	Standpipe Piezometer	BGC	TSF	5,608,796	682,286	934	-	-	6.4	4.0	5.5	-	Solinst Levelogger Model 3001 M10/F30	Glacial Till	Dry Well
BGC14-002D	Standpipe Piezometer	BGC	TSF	5,608,900	682,756	925	-	-	29.9	16.8	22.9	-	Solinst Levelogger Model 3001 M10/F30	Nicola Volcanics	2
BGC14-002S	Standpipe Piezometer	BGC	TSF	5,608,900	682,756	925	-	-	15.7	9.1	15.2	-	Solinst Levelogger Model 3001 M10/F30	Glacial Till	2
BGC14-003D	Standpipe Piezometer	BGC	TSF	5,608,858	683,544	897	-	-	32.3	28.4	31.4	-	Solinst Levelogger Model 3001 M10/F30	Nicola Volcanics	3
BGC14-003I	Standpipe Piezometer	BGC	TSF	5,608,858	683,544	897	-	-	22.0	16.8	19.8	-	Solinst Levelogger Model 3001 M10/F30	Fluvial / Glaciofluvial	3
BGC14-003S	Standpipe Piezometer	BGC	TSF	5,608,858	683,544	897	-	-	11.3	9.8	11.3	-	Solinst Levelogger Model 3001 M10/F30	Glacial Till	3
BGC14-004	Standpipe Piezometer	BGC	EMRSF	5,609,526	687,746	871	-	-	78.3	72.2	78.3	-	Solinst Levelogger Model 3001 M10/F30	Iron Mask Hybrid	9
BGC14-005	Standpipe Piezometer	BGC	EMRSF	5,609,519	687,161	878	-	-	50.5	47.2	50.5	-	Solinst Levelogger Model 3001 M10/F30	Iron Mask Hybrid	10
BGC14-006D	Standpipe Piezometer	BGC	EMRSF	5,610,779	687,288	940	-	-	29.6	20.4	26.5	-	Solinst Levelogger Model 3001 M10/F30	Iron Mask Hybrid	11
BGC14-006S	Standpipe Piezometer	BGC	EMRSF	5,610,779	687,288	940	-	-	14.3	11.0	14.0	-	Solinst Levelogger Model 3001 M10/F30	Glacial Till	11
BGC14-007D	Standpipe Piezometer	BGC	SMRSF	5,608,722	685,324	924	-	-	29.6	26.5	29.6	-	Solinst Levelogger Model 3001 M10/F30	Nicola Volcanics	15
BGC14-007S	Standpipe Piezometer	BGC	SMRSF	5,608,722	685,324	924	-	-	17.4	14.3	17.4	-	Solinst Levelogger Model 3001 M10/F30	Glacial Till	15
BGC14-008D	Standpipe Piezometer	BGC	SMRSF	5,608,923	686,107	878	-	-	29.6	26.5	29.6	-	Solinst Levelogger Model 3001 M10/F30	Iron Mask Hybrid	16
BGC14-008S	Standpipe Piezometer	BGC	SMRSF	5,608,923	686,107	878	-	-	6.1	4.6	6.1	-	Solinst Levelogger Model 3001 M10/F30	Fluvial / Glaciofluvial	16
BGC14-009	Standpipe Piezometer	BGC	SMRSF	5,608,547	686,799	919	-	-	54.0	47.9	54.0	-	Solinst Levelogger Model 3001 M10/F30	Iron Mask Hybrid	17
BGC14-010	Standpipe Piezometer	BGC	TSF	5,607,414	681,730	979	-	-	78.3	46.0	58.2	-	Solinst Levelogger Model 3001 M10/F30	Nicola Volcanics	4
BGC14-011D	Standpipe Piezometer	BGC	TSF	5,605,945	682,796	1029	-	-	29.6	23.5	29.6	-	Solinst Levelogger Model 3001 M10/F30	Nicola Volcanics	5
BGC14-011S	Standpipe Piezometer	BGC	TSF	5,605,945	682,796	1029	-	-	18.3	15.2	18.3	-	Solinst Levelogger Model 3001 M10/F30	Nicola Volcanics	5
BGC14-012D	Standpipe Piezometer	BGC	TSF	5,608,373	681,950	924	-	-	29.6	20.4	26.2	-	Solinst Levelogger Model 3001 M10/F30	Nicola Volcanics	6
BGC14-012S	Standpipe Piezometer	BGC	TSF	5,608,373	681,950	924	-	-	3.4	2.7	3.4	-	Solinst Levelogger Model 3001 M10/F30	Colluvium	6
BGC14-013	Standpipe Piezometer	BGC	SMRSF	5,606,777	686,466	987	-	-	30.5	27.4	30.5	-	Solinst Levelogger Model 3001 M10/F30	Nicola Volcanics	18
BGC14-014D	Standpipe Piezometer	BGC	SMRSF	5,607,810	686,672	986	-	-	29.6	23.5	29.6	-	Solinst Levelogger Model 3001 M10/F30	Nicola Volcanics	19
BGC14-014S	Standpipe Piezometer	BGC	SMRSF	5,607,810	686,672	986	-	-	18.9	12.8	18.9	-	Solinst Levelogger Model 3001 M10/F30	Glacial Till	19
BGC14-015D	Standpipe Piezometer	BGC	SMRSF	5,606,920	686,773	977	-	-	29.6	23.5	29.6	-	Solinst Levelogger Model 3001 M10/F30	Nicola Volcanics	20
BGC14-015S	Standpipe Piezometer	BGC	SMRSF	5,606,920	686,773	977	-	-	11.3	8.2	11.3	-	Solinst Levelogger Model 3001 M10/F30	Glacial Till	20
BGC14-016	Standpipe Piezometer	BGC	TSF	5,607,041	685,348	1039	-	-	29.6	23.5	29.6	-	Solinst Levelogger Model 3001 M10/F30	Nicola Volcanics	7
BGC14-017D	Standpipe Piezometer	BGC	TSF	5,605,928	685,540	1040	-	-	29.6	23.5	29.6	-	Solinst Levelogger Model 3001 M10/F30	Nicola Volcanics	Flowing artesian Well; minimum groundwater elevation above PVC stickup (1041.12 m asl)
BGC14-017S	Standpipe Piezometer	BGC	TSF	5,605,928	685,540	1040	-	-	5.2	3.0	4.6	-	Solinst Levelogger Model 3001 M10/F30	Glacial Till	8
BGC13-021	Standpipe Piezometer (Geotechnical Drillhole)	BGC	EMRSF	5,609,524	687,756	874	-	-	42.7	9.2	12.2	-	-	Fluvial / Glaciofluvial	9
BGC13-022	Standpipe Piezometer (Geotechnical Drillhole)	BGC	EMRSF	5,609,516	687,168	878	-	-	54.3	13.7	16.8	-	-	Glacial Till	10
DH-BGC11-ED-11	Standpipe Piezometer (Geotechnical Drillhole)	BGC	EMRSF	5,609,914	685,639	937	-	-	40.6	28.7	31.7	-	Solinst Levelogger Model 3001 M10/F30	Glacial Till	12
DH-BGC11-ED-14	Standpipe Piezometer (Geotechnical Drillhole)	BGC	EMRSF	5,609,281	686,721	890	-	-	38.7	24.9	27.9	-	Solinst Levelogger Model 3001 M10/F30	Fluvial / Glaciofluvial	10
DH-BGC11-ED-15	Standpipe Piezometer (Geotechnical Drillhole)	BGC	EMRSF	5,610,569	685,999	964	-	-	19.1	6.4	9.5	-	Solinst Levelogger Model 3001 M10/F30	Glacial Till	12
DH-BGC11-ES-16	Standpipe Piezometer (Geotechnical Drillhole)	BGC	SMRSF	5,608,160	686,295	994	-	-	31.2	18.0	21.0	-	-	Glacial Till	19
DH-BGC11-ND-04	Standpipe Piezometer (Geotechnical Drillhole)	BGC	JACKO LAKE NORTH	5,611,331	683,170	941	-	-	30.8	15.9	18.9	-	-	Glacial Till	Flowing artesian Well; minimum groundwater elevation above PVC stickup (942.32 m asl)
DH-BGC11-ND-05	Standpipe Piezometer (Geotechnical Drillhole)	BGC	JACKO LAKE NORTH	5,612,090	683,224	943	-	-	20.7	5.2	8.2	-	Solinst Levelogger Model 3001 M10/F30	Glacial Till	21
DH-BGC11-ND-06	Standpipe Piezometer (Geotechnical Drillhole)	BGC	JACKO LAKE NORTH	5,610,624	682,152	948	-	-	38.7	22.6	25.6	-	Solinst Levelogger Model 3001 M10/F30	Glacial Till	21
DH-BGC11-ND-07	Standpipe Piezometer (Geotechnical Drillhole)	BGC	JACKO LAKE NORTH	5,610,715	681,095	898	-	-	16.0	2.7	5.8	-	-	Glacial Till	21
DH-BGC11-ND-08	Standpipe Piezometer (Geotechnical Drillhole)	BGC	JACKO LAKE NORTH	5,611,360	681,087	899	-	-	29.8	17.6	20.7	-	Solinst Levelogger Model 3001 M10/F30	Glacial Till	21
DH-BGC11-ND-09	Standpipe Piezometer (Geotechnical Drillhole)	BGC	JACKO LAKE NORTH	5,612,246	681,170	879	-	-	13.1	0.6	3.6	-	Solinst Levelogger Model 3001 M10/F30	Glacial Till	21
DH-BGC11-ND-26	Standpipe Piezometer (Geotechnical Drillhole)	BGC	JACKO LAKE NORTH	5,611,044	683,023	937	-	-	14.4	7.8	13.9	-	-	Iron Mask Hybrid	21
DH-BGC11-PS-03	Standpipe Piezometer (Geotechnical Drillhole)	BGC	JACKO LAKE NORTH	5,611,393	684,007	987	-	-	51.5	27.7	33.8	-	-	Iron Mask Hybrid	22

Table 2. Ajax Project Active Groundwater Monitorng Network

Installation ID	Installation Type	Consultant	Location	Coordinates[1]			Plunge (°)	Trend (°)	Drilled Length (m)	Completion Zone[2]		Depth to VWP (mah)[2]	Datalogger Type	Screened/Monitored Hydrostratigraphy	Hydrograph Figure No. (Appendix G)
				Northing (m)	Easting (m)	Elevation (m asl)				From (mbgs)	To (mbgs)				
DH-BGC11-PS-19	Standpipe Piezometer (Geotechnical Drillhole)	BGC	JACKO LAKE NORTH	5,610,849	683,158	917	-	-	11.5	1.3	4.3	-	-	Glacial Till	22
DH-BGC11-PS-20	Standpipe Piezometer (Geotechnical Drillhole)	BGC	JACKO LAKE NORTH	5,610,729	683,109	915	-	-	9.9	1.8	7.9	-	-	Iron Mask Hybrid	22
DH-BGC11-PS-21	Standpipe Piezometer (Geotechnical Drillhole)	BGC	JACKO LAKE NORTH	5,610,769	683,279	927	-	-	14.3	4.4	13.6	-	-	Iron Mask Hybrid	22
DH-BGC11-PS-22	Standpipe Piezometer (Geotechnical Drillhole)	BGC	JACKO LAKE NORTH	5,610,792	683,394	934	-	-	17.4	10.7	16.8	-	-	Iron Mask Hybrid	22
DH-BGC11-PS-23	Standpipe Piezometer (Geotechnical Drillhole)	BGC	JACKO LAKE NORTH	5,610,859	683,245	926	-	-	15.9	5.6	14.7	-	-	Glacial Till	22
DH-BGC11-PS-24	Standpipe Piezometer (Geotechnical Drillhole)	BGC	JACKO LAKE NORTH	5,610,788	682,957	921	-	-	11.3	4.6	10.7	-	-	Iron Mask Hybrid	22
DH-BGC11-PS-25	Standpipe Piezometer (Geotechnical Drillhole)	BGC	JACKO LAKE NORTH	5,610,906	683,091	920	-	-	11.3	4.1	10.2	-	-	Iron Mask Hybrid	22
DH-BGC11-WC-17	Standpipe Piezometer (Geotechnical Drillhole)	BGC	OPEN PIT AREA	5,610,507	684,321	978	-	-	27.8	15.9	18.3	-	-	Glacial Till / Wasterock	39
DH-BGC11-WC-18	Standpipe Piezometer (Geotechnical Drillhole)	BGC	OPEN PIT AREA	5,610,556	684,240	960	-	-	12.6	1.2	2.7	-	-	Glacial Till	39
BGC10-MWA-075	VWP	BGC	OPEN PIT SOUTHWEST WALL	5,609,556	683,365	905	-	-	175.0	-	-	25.0	RST 10-Channel Datalogger Model No. DT2055	Glacial Till	27
BGC10-MWA-125	VWP	BGC	OPEN PIT SOUTHWEST WALL	5,609,556	683,365	905	-	-	175.0	-	-	125.0	RST 10-Channel Datalogger Model No. DT2055	Sugarloaf Diorite	27
BGC10-MWA-175	VWP	BGC	OPEN PIT SOUTHWEST WALL	5,609,556	683,365	905	-	-	175.0	-	-	175.0	RST 10-Channel Datalogger Model No. DT2055	Sugarloaf Diorite	27
BGC10-MWB-075	VWP	BGC	OPEN PIT SOUTHWEST WALL	5,609,533	683,326	905	-	-	175.0	-	-	75.0	RST 10-Channel Datalogger Model No. DT2055	Glacial Till	28
BGC10-MWB-125	VWP	BGC	OPEN PIT SOUTHWEST WALL	5,609,533	683,326	905	-	-	175.0	-	-	125.0	RST 10-Channel Datalogger Model No. DT2055	Sugarloaf Diorite	28
BGC10-MWB-175	VWP	BGC	OPEN PIT SOUTHWEST WALL	5,609,533	683,326	905	-	-	175.0	-	-	175.0	RST 10-Channel Datalogger Model No. DT2055	Sugarloaf Diorite	28
AE-10-064-D	VWP (Geotechnical Drillhole)	BGC	OPEN PIT NORTH WALL	5,609,911	684,800	920	-70	300	500.5	-	-	425.0	RST Single Channel Datalogger Model No. DT2011	Sugarloaf Diorite	41
AM-10-061-D	VWP (Geotechnical Drillhole)	BGC	OPEN PIT EAST	5,609,906	685,027	950	-60	75	450.2	-	-	399.9	RST Single Channel Datalogger Model No. DT2011	Sugarloaf Diorite	40
AM-10-061S	VWP (Geotechnical Drillhole)	BGC	OPEN PIT EAST	5,609,906	685,027	950	-60	75	450.2	-	-	201.2	RST Single Channel Datalogger Model No. DT2011	Nicola Volcanics - Picrite	40
AW-09-103-D	VWP (Geotechnical Drillhole)	BGC	OPEN PIT SOUTHWEST WALL	5,609,377	683,526	901	-70	230	507.2	-	-	366.0	RST Single Channel Datalogger Model No. DT2011	Nicola Volcanics - Picrite	26
AW-09-103-S	VWP (Geotechnical Drillhole)	BGC	OPEN PIT SOUTHWEST WALL	5,609,377	683,526	901	-70	230	507.2	-	-	85.7	RST Single Channel Datalogger Model No. DT2011	Nicola Volcanics	26
AW-10-105-D	VWP (Geotechnical Drillhole)	BGC	OPEN PIT AREA	5,609,660	683,456	888	-70	270	349.6	-	-	299.7	RST Single Channel Datalogger Model No. DT2011	Iron Mask Hybrid	38
AW-10-105-S	VWP (Geotechnical Drillhole)	BGC	OPEN PIT AREA	5,609,660	683,456	888	-70	270	349.6	-	-	125.4	RST Single Channel Datalogger Model No. DT2011	n Mask Hybrid / Sugarloaf Dior	38
KAX-13-004-D	VWP (Geotechnical Drillhole)	BGC	OPEN PIT SOUTHWEST WALL	5,609,317	683,365	896	-70	230	331.5	-	-	331.5	RST Single Channel Datalogger Model No. DT2011	Nicola Volcanics	29
KAX-13-004-S	VWP (Geotechnical Drillhole)	BGC	OPEN PIT SOUTHWEST WALL	5,609,317	683,365	896	-70	230	331.5	-	-	76.5	RST Single Channel Datalogger Model No. DT2011	Nicola Volcanics	29
KAX-13-007-D	VWP (Geotechnical Drillhole)	BGC	OPEN PIT SOUTHWEST WALL	5,609,782	683,187	949	-70	270	250.0	-	-	249.0	RST Single Channel Datalogger Model No. DT2011	Iron Mask Hybrid	30
KAX-13-007-S	VWP (Geotechnical Drillhole)	BGC	OPEN PIT SOUTHWEST WALL	5,609,782	683,187	949	-70	270	250.0	-	-	100.0	RST Single Channel Datalogger Model No. DT2011	Nicola Volcanics	30
AJGW01-D	Standpipe Piezometer	KP	OPEN PIT AREA	5,609,473	683,381	903	-	-	14.3	11.3	14.3	-	Solinst Levelogger Model 3001 M10/F30	Glacial Till	31
AJGW02-D	Standpipe Piezometer	KP	OPEN PIT AREA	5,609,337	683,581	900	-	-	19.8	16.2	19.8	-	Solinst Levelogger Model 3001 M10/F30	Nicola Volcanics	32
AJGW02-S	Standpipe Piezometer	KP	OPEN PIT AREA	5,609,337	683,581	900	-	-	8.2	1.8	8.2	-	Solinst Levelogger Model 3001 M10/F30	Glacial Till	32
AJGW03-D	Standpipe Piezometer	KP	OPEN PIT AREA	5,609,277	684,045	897	-	-	25.9	22.3	25.9	-	Solinst Levelogger Model 3001 M10/F30	Fluvial / Glaciofluvial	33
AJGW04-D	Standpipe Piezometer	KP	OPEN PIT AREA	5,609,265	684,191	890	-	-	29.0	22.9	29.0	-	Solinst Levelogger Model 3001 M10/F30	Glacial Till	34
AJGW05-S	Standpipe Piezometer	KP	OPEN PIT AREA	5,609,348	684,584	886	-	-	30.5	9.1	15.2	-	Solinst Levelogger Model 3001 M10/F30	Fluvial / Glaciofluvial	35
AJGW06-D	Standpipe Piezometer	KP	OPEN PIT AREA	5,609,448	685,013	903	-	-	32.0	22.9	32.0	-	Solinst Levelogger Model 3001 M10/F30	Iron Mask Hybrid	36
AJGW07-D	Standpipe Piezometer	KP	OPEN PIT AREA	5,609,634	683,278	909	-	-	29.0	22.9	29.0	-	Solinst Levelogger Model 3001 M10/F30	Nicola Volcanics	37
AJGW07-S	Standpipe Piezometer	KP	OPEN PIT AREA	5,609,634	683,278	909	-	-	17.5	9.8	17.5	-	Solinst Levelogger Model 3001 M10/F30	Fluvial / Glaciofluvial	37
MW11-01D	Standpipe Piezometer	KP	PROJECT SITE WEST	5,612,279	679,814	928	-	-	54.5	50.5	53.5	-	Solinst Levelogger Model 3001 M10/F30	Iron Mask Hybrid	43
MW11-01S	Standpipe Piezometer	KP	PROJECT SITE WEST	5,612,279	679,814	928	-	-	23.4	19.4	22.4	-	Solinst	Glacial Till	43

Table 2. Ajax Project Active Groundwater Monitorng Network

Installation ID	Installation Type	Consultant	Location	Coordinates[1]			Plunge (°)	Trend (°)	Drilled Length (m)	Completion Zone[2]		Depth to VWP (mah)[2]	Datalogger Type	Screened/Monitored Hydrostratigraphy	Hydrograph Figure No. (Appendix G)
				Northing (m)	Easting (m)	Elevation (m asl)				From (mbgs)	To (mbgs)				
MW11-02	Standpipe Piezometer	KP	PROJECT SITE WEST	5,610,272	680,578	855	-	-	42.1	38.7	41.7	-	Solinst	Nicola Volcanics	44
MW11-03D	Standpipe Piezometer	KP	PROJECT SITE WEST	5,611,179	678,891	812	-	-	41.9	38.2	41.2	-	Solinst Levelogger Model 3001 M10/F30	Nicola Volcanics	45
MW11-03S	Standpipe Piezometer	KP	PROJECT SITE WEST	5,611,179	678,891	812	-	-	18.6	14.7	17.7	-	Solinst Levelogger Model 3001 M10/F30 & Barologger	Glacial Till	45
MW11-04D	Standpipe Piezometer	KP	JACKO LAKE NORTH	5,610,360	682,620	899	-	-	35.5	31.6	34.6	-	Solinst	Iron Mask Hybrid	23
MW11-04S	Standpipe Piezometer	KP	JACKO LAKE NORTH	5,610,360	682,620	899	-	-	21.3	17.6	20.6	-	Solinst	Iron Mask Hybrid	23
MW11-05D	Standpipe Piezometer	KP	EMRSF	5,610,502	686,804	961	-	-	29.6	25.6	28.6	-	Solinst	Iron Mask Hybrid	13
MW11-05S	Standpipe Piezometer	KP	EMRSF	5,610,502	686,804	961	-	-	14.6	12.7	14.2	-	Solinst	Iron Mask Hybrid	13
MW11-06D	Standpipe Piezometer	KP	JACKO LAKE NORTH	5,612,052	683,485	943	-	-	45.7	42.3	45.3	-	Solinst Levelogger Model 3001 M10/F30	Iron Mask Hybrid	Flowing artesian Well; minimum groundwater elevation above PVC stickup (943 m asl)
MW11-06S	Standpipe Piezometer	KP	JACKO LAKE NORTH	5,612,052	683,485	943	-	-	10.7	8.3	9.8	-	Solinst Levelogger Model 3001 M10/F30	Fluvial / Glaciofluvial	Flowing artesian Well; minimum groundwater elevation above PVC stickup (943 m asl)
MW11-07D	Standpipe Piezometer	KP	JACKO LAKE NORTH	5,612,830	681,620	941	-	-	51.8	47.9	50.9	-	Solinst	Iron Mask Hybrid	24
MW11-07S	Standpipe Piezometer	KP	JACKO LAKE NORTH	5,612,830	681,620	941	-	-	7.6	5.8	7.3	-	Solinst	Iron Mask Hybrid	24
MW11-08D	Standpipe Piezometer	KP	JACKO LAKE SOUTH	5,608,940	681,471	897	-	-	33.5	31.3	32.8	-	Solinst	Nicola Volcanics	25
MW11-08S	Standpipe Piezometer	KP	JACKO LAKE SOUTH	5,608,940	681,471	897	-	-	18.2	14.3	17.3	-	Solinst	Glacial Till	25
MW11-09D	Standpipe Piezometer	KP	PROJECT SITE WEST	5,608,898	679,938	910	-	-	30.5	28.4	29.9	-	Solinst	Nicola Volcanics	46
MW11-09S	Standpipe Piezometer	KP	PROJECT SITE WEST	5,608,898	679,938	910	-	-	15.4	11.5	14.5	-	-	Nicola Volcanics	46
MW11-10D	Standpipe Piezometer	KP	EMRSF	5,609,465	687,492	887	-	-	81.4	76.2	79.2	-	Solinst	Fluvial / Glaciofluvial	14
MW11-10S	Standpipe Piezometer	KP	EMRSF	5,609,465	687,492	887	-	-	23.8	20.2	23.2	-	Solinst	Glacial Till	14
KAX-14-107D	Standpipe Piezometer	KCBL	OPEN PIT / JACKO LAKE	5,609,202	683,224	896	-	-	128.0	56.7	75.0	-	-	Picrite	New well; only 2 data points available in 2014
KAX-14-107S	Standpipe Piezometer	KCBL	OPEN PIT / JACKO LAKE	5,609,202	683,224	896	-	-	38.5	29.9	38.0	-	-	Lacustrine	New well; only 2 data points available in 2014
KAX-14-108D	Standpipe Piezometer	KCBL	OPEN PIT / JACKO LAKE	5,609,428	683,140	901	-	-	148.4	92.8	110.8	-	-	Picrite (Fractured zone)	New well; only 2 data points available in 2014
KAX-14-108S	Standpipe Piezometer	KCBL	OPEN PIT / JACKO LAKE	5,609,428	683,140	901	-	-	36.0	32.3	35.4	-	-	Glacial Till	New well; only 2 data points available in 2014
KAX-14-114D	Standpipe Piezometer	KCBL	OPEN PIT / JACKO LAKE	5,609,277	683,210	896	-	-	124.0	104.4	122.7	-	-	Picrite (Fractured zone)	New well; only 2 data points available in 2014
KAX-14-114S	Standpipe Piezometer	KCBL	OPEN PIT / JACKO LAKE	5,609,277	683,210	896	-	-	33.0	22.0	31.1	-	-	lacial Till or Fluvial / Glaciofluvi	New well; only 2 data points available in 2014
KAX-14-121	Standpipe Piezometer	KCBL	OPEN PIT / JACKO LAKE	5,609,611	683,211	909	-70	210	150.9	144.1	150.2	-	-	Volcanics, Picrite / Sugarloaf I	New well; only 2 data points available in 2014
KAX-14-128D	Standpipe Piezometer	KCBL	OPEN PIT / JACKO LAKE	5,609,497	683,325	904	-	-	198.8	71.7	90.0	-	-	Nicola Volcanics	New well; only 2 data points available in 2014
KAX-14-128S	Standpipe Piezometer	KCBL	OPEN PIT / JACKO LAKE	5,609,497	683,325	904	-	-	18.0	10.9	17.0	-	-	luvial / Glaciofluvial or Lacustrir	New well; only 2 data points available in 2014
KAX-14-124A	VWP (Geotechnical Drillhole)	KCBL	OPEN PIT / JACKO LAKE	5,609,491	683,316	904	-70	305	250.0	-	-	50.4	RST datalogger	Picrite	New well; only 2 data points available in 2014
KAX-14-124B	VWP (Geotechnical Drillhole)	KCBL	OPEN PIT / JACKO LAKE	5,609,491	683,316	904	-70	305	250.0	-	-	190.4	RST datalogger	Sugarloaf Diorite	New well; only 2 data points available in 2014
KAX-14-130A	VWP (Geotechnical Drillhole)	KCBL	OPEN PIT / JACKO LAKE	5,609,272	683,214	896	-70	305	225.0	-	-	175.3	RST datalogger	Nicola Volcanics	New well; only 2 data points available in 2014
KAX-14-130B	VWP (Geotechnical Drillhole)	KCBL	OPEN PIT / JACKO LAKE	5,609,272	683,214	896	-70	305	225.0	-	-	222.3	RST datalogger	Picrite	New well; only 2 data points available in 2014

Table 2. Ajax Project Active Groundwater Monitorng Network

Installation ID	Installation Type	Consultant	Location	Coordinates[1]			Plunge (°)	Trend (°)	Drilled Length (m)	Completion Zone[2]		Depth to VWP (mah)[2]	Datalogger Type	Screened/Monitored Hydrostratigraphy	Hydrograph Figure No. (Appendix G)
				Northing (m)	Easting (m)	Elevation (m asl)				From (mbgs)	To (mbgs)				
BH10-10	Standpipe Piezometer (Geotechnical Drillhole)	Golder	PROJECT SITE WEST	5,610,334	680,972	873	-	-	15.2	11.9	14.9	-	-	Kamloops Group	42
BH10-11	Standpipe Piezometer (Geotechnical Drillhole)	Golder	PROJECT SITE WEST	5,610,537	680,877	852	-	-	21.3	17.4	20.4	-	-	Glacial Till	42
BH10-12	Standpipe Piezometer (Geotechnical Drillhole)	Golder	PROJECT SITE WEST	5,610,893	680,849	863	-	-	29.9	9.9	13.0	-	-	Glacial Till	42
BH10-14	Standpipe Piezometer (Geotechnical Drillhole)	Golder	PROJECT SITE WEST	5,612,331	680,252	930	-	-	18.3	16.5	18.0	-	-	Glacial Till	Dry Well
BH10-9	Standpipe Piezometer (Geotechnical Drillhole)	Golder	PROJECT SITE WEST	5,610,556	680,382	855	-	-	16.5	14.6	16.3	-	-	Kamloops Group	Dry Well

Notes
1. Coordinates are based on NAD 83 Zone 10N, except BGC Standpipes which were approximated using a handheld GPS. Ground surface elevations estimated from LIDAR.
2. Completion zone is top and bottom of well screens.
3. Coordinates of VWP tip based on survey data.
4. VWP = Vibrating Wire Piezometer, "-" = not applicable.
5. Standpipe = Geotechnical drillhole with standpipe pieozometer
6. TSF = Tailing Storage Facility, NMRSF = North Mine Rock Storage Facility, SMRSF = South Mine Rock Storage Facility, EMRSF = East Mine Rock Storage Facility

Table 3. Summary of Hydraulic Conductivity (K) Testing

Consultant	Drillhole ID	Packer Tests			Falling/Rising Head Slug			Pumping Tests				Pump-In Tests		Interpreted Hydrostratigraphic Unit	Logged Lithology
		Packer Zone		K	Screened Zone		K	Screened Zone		VWP Installation Depth	K	Test Depth	K		
		From (mbgs)	To (mbgs)	(m/s)	From (mbgs)	To (mbgs)	(m/s)	From (mbgs)	To (mbgs)	(mah)	(m/s)	(mbgs)	(m/s)		
BGC	BGC13-006	26.5	34.4	< 1 E-09	-	-	-	-	-	-	-	-	-	Iron Mask Hybrid	IMH
BGC	BGC13-008	26.2	34.1	2 E-7	-	-	-	-	-	-	-	-	-	Iron Mask Hybrid	IMH
BGC	BGC13-019	8.2	14.6	4 E-08	-	-	-	-	-	-	-	-	-	Iron Mask Hybrid	IMH
BGC	BGC13-020	8.2	14.6	3 E-08	-	-	-	-	-	-	-	-	-	Iron Mask Hybrid	IMH
BGC	BGC13-021	-	-	-	-	-	-	9.2	12.2	-	1 E-04	-	-	Glacial Till, Diamicton and Undivided Glacial Material	Sand/Gravel
BGC	BGC13-022	49.4	54.3	8 E-08	-	-	-	-	-	-	-	-	-	Iron Mask Hybrid	IMH
BGC	BGC13-022	-	-	-	-	-	-	13.7	16.8	-	2 E-05	-	-	Glacial Till, Diamicton and Undivided Glacial Material	Till
BGC	BGC14-001D	-	-	-	18.0	24.1	2 E-06	-	-	-	-	-	-	Nicola Group Volcanics and Sediments	NV
BGC	BGC14-002D	-	-	-	16.8	22.9	4 E-06	-	-	-	-	-	-	Nicola Group Volcanics and Sediments	NV
BGC	BGC14-002S	-	-	-	9.1	15.2	1 E-07	-	-	-	-	-	-	Glacial Till, Diamicton and Undivided Glacial Material	Till
BGC	BGC14-003D	-	-	-	28.4	31.4	2 E-08	-	-	-	-	-	-	Nicola Group Volcanics and Sediments	NV
BGC	BGC14-003I	-	-	-	16.8	19.8	6 E-06	-	-	-	-	-	-	Fluvial and Glaciofluvial Sands and Gravels	Sand/Gravel
BGC	BGC14-003S	-	-	-	9.8	11.3	3 E-07	-	-	-	-	-	-	Glacial Till, Diamicton and Undivided Glacial Material	Till
BGC	BGC14-004	-	-	-	72.2	78.3	4 E-07	-	-	-	-	-	-	Iron Mask Hybrid	IMH
BGC	BGC14-004	-	-	-	-	-	-	72.2	78.3	-	2 E-05	-	-	Iron Mask Hybrid	IMH
BGC	BGC14-005	-	-	-	47.2	50.5	7 E-08	-	-	-	-	-	-	Iron Mask Hybrid	IMH
BGC	BGC14-005	-	-	-	-	-	-	47.2	50.5	-	2 E-05	-	-	Iron Mask Hybrid	IMH
BGC	BGC14-006D	-	-	-	20.4	26.5	1 E-07	-	-	-	-	-	-	Iron Mask Hybrid	IMH
BGC	BGC14-006S	-	-	-	11.0	14.0	1 E-08	-	-	-	-	-	-	Glacial Till, Diamicton and Undivided Glacial Material	Till
BGC	BGC14-009	-	-	-	47.9	54.0	2 E-07	-	-	-	-	-	-	Iron Mask Hybrid	IMH
BGC	BGC14-010	-	-	-	46.0	58.2	5 E-08	-	-	-	-	-	-	Nicola Group Volcanics and Sediments	NV
BGC	BGC14-011D	-	-	-	23.5	29.6	3 E-07	-	-	-	-	-	-	Undivided Bedrock	Bedrock
BGC	BGC14-011S	-	-	-	15.2	18.3	1 E-06	-	-	-	-	-	-	Undivided Bedrock	Bedrock
BGC	BGC14-012D	-	-	-	20.4	26.2	8 E-07	-	-	-	-	-	-	Nicola Group Volcanics and Sediments	NV
BGC	BGC14-012S	-	-	-	2.7	3.4	9 E-04	-	-	-	-	-	-	Colluvium	Colluvium
BGC	BGC14-013	-	-	-	27.4	30.5	2 E-08	-	-	-	-	-	-	Nicola Group Volcanics and Sediments	NV
BGC	BGC14-014D	-	-	-	23.5	29.6	1 E-09	-	-	-	-	-	-	Nicola Group Volcanics and Sediments	NV
BGC	BGC14-015D	-	-	-	23.5	29.6	9 E-09	-	-	-	-	-	-	Nicola Group Volcanics and Sediments	NV
BGC	BGC14-015S	-	-	-	8.2	11.3	1 E-07	-	-	-	-	-	-	Glacial Till, Diamicton and Undivided Glacial Material	Till
BGC	BGC14-016	-	-	-	23.5	29.6	5 E-08	-	-	-	-	-	-	Nicola Group Volcanics and Sediments	NV
BGC	BGC14-017D	-	-	-	23.5	29.6	4 E-09	-	-	-	-	-	-	Nicola Group Volcanics and Sediments	NV
BGC	BGC14-017S	-	-	-	3.0	4.6	2 E-07	-	-	-	-	-	-	Glacial Till, Diamicton and Undivided Glacial Material	Till
BGC	BGC14-018	-	-	-	-	-	-	74.1	75.0	-	2 E-05	-	-	Fluvial and Glaciofluvial Sands and Gravels	Sand/Gravel
BGC	BGC14-PW01	-	-	-	-	-	-	76.2	79.2	-	4 E-05	-	-	Fluvial and Glaciofluvial Sands and Gravels	Sand/Gravel
BGC	BGC10-PW01	-			-	-	-	34.0	200.0	-	2 E-08	-	-	Undivided Bedrock	Bedrock
											2 E-08			Undivided Bedrock	Bedrock
											2 E-08			Undivided Bedrock	Bedrock
BGC	BGC10-MWA	-	-	-	-	-	-	-	-	75	3 E-08	-	-	Undivided Bedrock	Bedrock
											2 E-08			Undivided Bedrock	Bedrock
										125	2 E-08			Undivided Bedrock	Bedrock
											1 E-08			Undivided Bedrock	Bedrock
										175	2 E-08			Undivided Bedrock	Bedrock
											1 E-08			Undivided Bedrock	Bedrock
BGC	BGC10-MWB	-	-	-	-	-	-	-	-	75	2 E-07	-	-	Undivided Bedrock	Bedrock
											1 E-07			Undivided Bedrock	Bedrock
										125	4 E-08			Undivided Bedrock	Bedrock
											2 E-08			Undivided Bedrock	Bedrock
										175	2 E-08			Undivided Bedrock	Bedrock
											1 E-08			Undivided Bedrock	Bedrock

Table 3. Summary of Hydraulic Conductivity (K) Testing

Consultant	Drillhole ID	Packer Tests			Falling/Rising Head Slug			Pumping Tests				Pump-In Tests		Interpreted Hydrostratigraphic Unit	Logged Lithology
		Packer Zone		K	Screened Zone		K	Screened Zone		VWP Installation Depth	K	Test Depth	K		
		From (mbgs)	To (mbgs)	(m/s)	From (mbgs)	To (mbgs)	(m/s)	From (mbgs)	To (mbgs)	(mah)	(m/s)	(mbgs)	(m/s)		
BGC	AE-10-064	62.0	81.0	2 E-08	-	-	-	-	-	-	-	-	-	Sugarloaf Diorite	SLD
		126.0	139.0	2 E-08										Sugarloaf Diorite	SLD
		282.0	286.0	3 E-09										Iron Mask Hybrid	IMH
		368.0	381.0	4 E-10										Iron Mask Hybrid	IMH
		443.0	473.0	4 E-09										Sugarloaf Diorite	SLD
BGC	AE-10-065	58.0	69.0	4 E-09	-	-	-	-	-	-	-	-	-	Sugarloaf Diorite	SLD
		139.0	144.0	2 E-08										Sugarloaf Diorite	SLD
		228.0	236.0	2 E-08										Sugarloaf Diorite	SLD
		308.0	320.0	1 E-08										Sugarloaf Diorite	SLD
		397.0	410.0	1 E-08										Sugarloaf Diorite	SLD
		423.0	470.0	5 E-09										Sugarloaf Diorite	SLD
BGC	AM-10-054	87.0	104.0	3 E-09	-	-	-	-	-	-	-	-	-	Sugarloaf Diorite	SLD
		155.0	173.0	3 E-09										Sugarloaf Diorite	SLD
		260.0	264.0	8 E-08										Sugarloaf Diorite	SLD
		341.0	346.0	1 E-08										Sugarloaf Diorite	SLD
		466.0	494.0	2 E-08										Nicola Group Volcanics and Sediments	NV
BGC	AM-10-061	79.0	89.0	2 E-08	-	-	-	-	-	-	-	-	-	Iron Mask Hybrid	IMH
		178.0	202.0	4 E-08										Nicola Group Volcanics and Sediments	NV
		269.0	284.0	2 E-08										Sugarloaf Diorite	SLD
		367.0	394.0	3 E-08										Sugarloaf Diorite	SLD
BGC	AM-10-067	107.0	121.0	3 E-08	-	-	-	-	-	-	-	-	-	Sugarloaf Diorite	SLD
		203.0	232.0	2 E-08										Sugarloaf Diorite	SLD
		272.0	292.0	2 E-08										Nicola Group Volcanics and Sediments	NV
		358.0	383.0	2 E-08										Sugarloaf Diorite	SLD
BGC	AN-10-075	76.0	91.0	2 E-08	-	-	-	-	-	-	-	-	-	Sugarloaf Diorite	SLD
		174.0	202.0	3 E-08										Undivided Bedrock	Bedrock
		244.0	272.0	6 E-08										Nicola Group Volcanics and Sediments	NV
BGC	AW-08-074	111.0	114.0	3 E-08	-	-	-	-	-	-	-	-	-	Sugarloaf Diorite	SLD
		175.0	178.0	2 E-08										Iron Mask Hybrid	IMH
		236.0	238.0	4 E-08										Iron Mask Hybrid	IMH
BGC	AW-09-103	64.0	76.0	1 E-06	-	-	-	-	-	-	-	-	-	Nicola Group Volcanics and Sediments	NV
		120.0	128.0	2 E-08	-	-	-	-	-	-	-	-	-	Nicola Group Volcanics and Sediments	NV
		190.0	204.0	8 E-09	-	-	-	-	-	-	-	-	-	Nicola Group Volcanics and Sediments	NV
		270.0	294.0	6 E-09	-	-	-	-	-	-	-	-	-	Nicola Group Volcanics and Sediments	NV
		-	-	-	-	-	-	-	-	81	5 E-08	-	-	Undivided Bedrock	Bedrock
BGC	AW-09-104	55.0	70.0	6 E-07	-	-	-	-	-	-	-	-	-	Sugarloaf Diorite	SLD
		135.0	151.0	3 E-08	-	-	-	-	-	-	-	-	-	Nicola Group Volcanics and Sediments	NV
		212.0	228.0	7 E-09	-	-	-	-	-	-	-	-	-	Nicola Group Volcanics and Sediments	NV
		-	-	-	-	-	-	-	-	216	6 E-08	-	-	Undivided Bedrock	Bedrock
BGC	AW-10-105	89.0	101.0	1 E-08	-	-	-	-	-	-	-	-	-	Sugarloaf Diorite	SLD
		110.0	128.0	2 E-09										Iron Mask Hybrid	IMH
		149.0	162.0	4 E-08										Iron Mask Hybrid	IMH
		179.0	189.0	3 E-08										Iron Mask Hybrid	IMH
		191.0	202.0	2 E-10										Iron Mask Hybrid	IMH
		261.0	274.0	2 E-08										Iron Mask Hybrid	IMH
		285.0	299.0	9 E-09										Iron Mask Hybrid	IMH
		307.0	322.0	3 E-09										Iron Mask Hybrid	IMH
BGC	AW-10-106	85.0	97.0	7 E-09	-	-	-	-	-	-	-	-	-	Iron Mask Hybrid	IMH
		130.0	152.0	1 E-08										Iron Mask Hybrid	IMH
		225.0	252.0	1 E-08										Iron Mask Hybrid	IMH
		284.0	308.0	2 E-10										Iron Mask Hybrid	IMH
		346.0	373.0	7 E-09										Iron Mask Hybrid	IMH

Table 3. Summary of Hydraulic Conductivity (K) Testing

Consultant	Drillhole ID	Packer Tests			Falling/Rising Head Slug			Pumping Tests				Pump-In Tests		Interpreted Hydrostratigraphic Unit	Logged Lithology
		Packer Zone		K	Screened Zone		K	Screened Zone		VWP Installation Depth	K	Test Depth	K		
		From (mbgs)	To (mbgs)	(m/s)	From (mbgs)	To (mbgs)	(m/s)	From (mbgs)	To (mbgs)	(mah)	(m/s)	(mbgs)	(m/s)		
BGC	AW-10-118	59.0	71.0	4 E-08	-	-	-	-	-	-	-	-	-	Undivided Bedrock	Bedrock
		129.0	142.0	3 E-08										Sugarloaf Diorite	SLD
		228.0	241.0	6 E-08										Undivided Bedrock	Bedrock
		356.0	369.0	2 E-08										Undivided Bedrock	Bedrock
BGC	KAX-13-004	46.3	61.5	6 E-07	-	-	-	-	-	-	-	-	-	Picrite	Picrite
		111.9	129.0	3 E-09										Nicola Group Volcanics and Sediments	NV
		196.3	211.5	3 E-09										Picrite	Picrite
		299.8	331.5	8 E-07										Nicola Group Volcanics and Sediments	NV
BGC	KAX-13-005	28.3	55.5	1 E-07	-	-	-	-	-	-	-	-	-	Picrite	Picrite
		39.8	55.5	1 E-07										Nicola Group Volcanics and Sediments	NV
		54.8	83.5	1 E-07										Picrite	Picrite
		86.8	118.5	4 E-09										Picrite	Picrite
		113.8	144.0	3 E-09										Nicola Group Volcanics and Sediments	NV
		197.8	205.5	1 E-06										Sugarloaf Diorite	SLD
		206.8	226.5	5 E-09										Sugarloaf Diorite	SLD
		314.8	330.0	1 E-08										Sugarloaf Diorite	SLD
		188.8	196.1	4 E-08										Sugarloaf Diorite	SLD
		152.8	158.8	1 E-08										Nicola Group Volcanics and Sediments	NV
		218.9	224.9	3 E-08										Sugarloaf Diorite	SLD
BGC	KAX-13-007	26.3	46.0	3 E-08	-	-	-	-	-	-	-	-	-	Iron Mask Hybrid	IMH
		65.3	97.0	6 E-08										Iron Mask Hybrid	IMH
		95.3	130.0	8 E-09										Iron Mask Hybrid	IMH
		128.3	163.0	2 E-08										Iron Mask Hybrid	IMH
		170.3	184.0	2 E-08										Iron Mask Hybrid	IMH
		227.3	250.0	1 E-08										Iron Mask Hybrid	IMH
BGC	DH-BGC15-01	54.8	64.3	3 E-06	-	-	-	-	-	-	-	-	-	Picrite	Picrite
		71.2	79.0	3 E-06										Picrite	Picrite/Mudstone
		131.3	140.5	4 E-07										Picrite	Picrite
		182.3	200.5	1 E-06										Nicola Group Volcanics and Sediments	Sandstone
		168.8	176.3	2 E-07										Nicola Group Volcanics and Sediments	Sandstone
		54.8	60.8	1 E-06										Picrite	Picrite
BGC	DH-BGC15-02	101.2	111.9	6 E-08	-	-	-	-	-	-	-	-	-	Nicola Group Volcanics and Sediments	Volcaniclastic
		164.2	176.4	2 E-08										Nicola Group Volcanics and Sediments	Volcaniclastic
		198.9	225.9	4 E-09										Nicola Group Volcanics and Sediments	Volcaniclastic
KP	MW11-01D	-	-	-	51.0	54.0	3 E-08	-	-	-	-	-	-	Iron Mask Hybrid	IMH
KP	MW11-01S	-	-	-	19.0	22.0	8 E-06	-	-	-	-	-	-	Glacial Till, Diamicton and Undivided Glacial Material	Till
KP	MW11-02	-	-	-	39.0	42.0	3 E-08	-	-	-	-	-	-	Nicola Group Volcanics and Sediments	NV
KP	MW11-03D	-	-	-	38.0	41.0	<1E-09	-	-	-	-	-	-	Nicola Group Volcanics and Sediments	NV
KP	MW11-04D	-	-	-	32.0	35.0	5 E-07	-	-	-	-	-	-	Iron Mask Hybrid	IMH
KP	MW11-04S	-	-	-	18.0	21.0	<1E-09	-	-	-	-	-	-	Iron Mask Hybrid	IMH
KP	MW11-05D	-	-	-	26.0	29.0	<5E-9	-	-	-	-	-	-	Iron Mask Hybrid	IMH
KP	MW11-05S	-	-	-	13.0	14.0	<5E-9	-	-	-	-	-	-	Iron Mask Hybrid	IMH
KP	MW11-07D	-	-	-	48.0	51.0	2 E-06	-	-	-	-	-	-	Iron Mask Hybrid	IMH
KP	MW11-07S	-	-	-	6.0	7.0	6 E-07	-	-	-	-	-	-	Iron Mask Hybrid	IMH
KP	MW11-08D	-	-	-	31.0	33.0	8 E-06	-	-	-	-	-	-	Nicola Group Volcanics and Sediments	NV
KP	MW11-09D	-	-	-	28.0	30.0	1 E-08	-	-	-	-	-	-	Nicola Group Volcanics and Sediments	NV
KP	MW11-09S	-	-	-	12.0	15.0	4 E-08	-	-	-	-	-	-	Nicola Group Volcanics and Sediments	NV
KP	MW11-10D	-	-	-	76.0	79.0	9 E-04	-	-	-	-	-	-	Fluvial and Glaciofluvial Sands and Gravels	Sand/Gravel
KP	MW11-10D	-	-	-	-	-	-	76.0	79.0	-	2 E-05	-	-	Fluvial and Glaciofluvial Sands and Gravels	Sand/Gravel
KP	MW11-10S	-	-	-	20.0	23.0	1 E-09	-	-	-	-	-	-	Glacial Till, Diamicton and Undivided Glacial Material	Sand/Gravel
KP	AJGW01-D	-	-	-	11.0	14.0	2 E-07	-	-	-	-	-	-	Glacial Till, Diamicton and Undivided Glacial Material	Till
KP	AJGW02-S	-	-	-	-	-	-	2.0	8.0	-	3 E-07	-	-	Glacial Till, Diamicton and Undivided Glacial Material	Till
KP	AJGW04-D	-	-	-	23.0	29.0	2 E-08	-	-	-	-	-	-	Glacial Till, Diamicton and Undivided Glacial Material	Till
KP	AJGW06-D	-	-	-	23.0	32.0	7 E-08	-	-	-	-	-	-	Iron Mask Hybrid	IMH
KP	AJGW07-S	-	-	-	10.0	18.0	8 E-06	-	-	-	-	-	-	Fluvial and Glaciofluvial Sands and Gravels	Sand/Gravel
KP	AJGW07-D	-	-	-	23.0	29.0	3 E-05	-	-	-	-	-	-	Undivided Surficial Deposits	Overburden
KP	DH14-057	-	-	-	-	-	-	36.5	39.5	-	6 E-05	-	-	Iron Mask Hybrid	IMH
Golder	BH10-9	-	-	-	15.0	16.0	2 E-09	-	-	-	-	-	-	Kamloops Group	KAM
Golder	BH10-10	-	-	-	12.0	15.0	1 E-07	-	-	-	-	-	-	Kamloops Group	KAM
Golder	BH10-11	-	-	-	17.0	20.0	2 E-09	-	-	-	-	-	-	Glacial Till, Diamicton and Undivided Glacial Material	Till
Golder	BH10-12	-	-	-	10.0	13.0	5 E-10	-	-	-	-	-	-	Glacial Till, Diamicton and Undivided Glacial Material	Till

Table 3. Summary of Hydraulic Conductivity (K) Testing

Consultant	Drillhole ID	Packer Tests			Falling/Rising Head Slug			Pumping Tests				Pump-In Tests		Interpreted Hydrostratigraphic Unit	Logged Lithology
		Packer Zone		K	Screened Zone		K	Screened Zone		VWP Installation Depth	K	Test Depth	K		
		From (mbgs)	To (mbgs)	(m/s)	From (mbgs)	To (mbgs)	(m/s)	From (mbgs)	To (mbgs)	(mah)	(m/s)	(mbgs)	(m/s)		
KCB	KAX-14-107	90.3	128.0	3 E-10	-	-	-	-	-	-	-	-	-	Nicola Group Volcanics and Sediments	NV
KCB	KAX-14-107	101.5	108.5	8 E-09	-	-	-	-	-	-	-	-	-	Nicola Group Volcanics and Sediments	NV
KCB	KAX-14-107	56.0	62.0	3 E-07	-	-	-	-	-	-	-	-	-	Picrite	Picrite
KCB	KAX-14-107	68.0	74.0	4 E-07	-	-	-	-	-	-	-	-	-	Picrite	Picrite
KCB	KAX-14-108	121.8	128.0	3 E-08	-	-	-	-	-	-	-	-	-	Picrite	Picrite
KCB	KAX-14-108	83.5	93.5	4 E-09	-	-	-	-	-	-	-	-	-	Picrite	Picrite
KCB	KAX-14-108	67.5	78.5	7 E-09	-	-	-	-	-	-	-	-	-	Picrite	Picrite
KCB	KAX-14-108	98.8	114.5	2 E-08	-	-	-	-	-	-	-	-	-	Picrite	Picrite
KCB	KAX-14-108	132.3	148.4	2 E-08	-	-	-	-	-	-	-	-	-	Picrite	Picrite
KCB	KAX-14-108	47.0	58.0	3 E-07	-	-	-	-	-	-	-	-	-	Picrite	Picrite
KCB	KAX-14-108	41.0	44.0	7 E-08	-	-	-	-	-	-	-	-	-	Picrite	Picrite
KCB	KAX-14-114	79.0	85.0	1 E-09	-	-	-	-	-	-	-	-	-	Picrite	Picrite
KCB	KAX-14-114	85.8	110.0	3 E-08	-	-	-	-	-	-	-	-	-	Picrite	Picrite
KCB	KAX-14-114	52.0	59.5	1 E-07	-	-	-	-	-	-	-	-	-	Picrite	Picrite
KCB	KAX-14-114	41.0	47.0	9 E-09	-	-	-	-	-	-	-	-	-	Picrite	Picrite
KCB	KAX-14-114	67.3	74.0	2 E-08	-	-	-	-	-	-	-	-	-	Picrite	Picrite
KCB	KAX-14-114	47.8	50.0	2 E-07	-	-	-	-	-	-	-	-	-	Picrite	Picrite
KCB	KAX-14-121	110.3	150.9	3 E-09	-	-	-	-	-	-	-	-	-	Nicola Group Volcanics and Sediments	NV
KCB	KAX-14-121	105.0	114.0	6 E-09	-	-	-	-	-	-	-	-	-	Nicola Group Volcanics and Sediments	NV
KCB	KAX-14-121	118.0	122.5	1 E-07	-	-	-	-	-	-	-	-	-	Nicola Group Volcanics and Sediments	NV
KCB	KAX-14-121	99.7	129.9	5 E-09	-	-	-	-	-	-	-	-	-	Picrite	Picrite
KCB	KAX-14-121	46.0	48.0	5 E-09	-	-	-	-	-	-	-	-	-	Sugarloaf Diorite	SLD
KCB	KAX-14-121	36.4	48.9	1 E-08	-	-	-	-	-	-	-	-	-	Picrite	Picrite
KCB	KAX-14-121	14.5	27.9	4 E-07	-	-	-	-	-	-	-	-	-	Picrite	Picrite
KCB	KAX-14-121	125.2	129.9	8 E-09	-	-	-	-	-	-	-	-	-	Sugarloaf Diorite	SLD
KCB	KAX-14-121	142.2	150.2	2 E-08	-	-	-	-	-	-	-	-	-	Sugarloaf Diorite	SLD
KCB	KAX-14-121	65.3	72.9	3 E-08	-	-	-	-	-	-	-	-	-	Sugarloaf Diorite	SLD
KCB	KAX-14-124	71.3	83.5	9 E-08	-	-	-	-	-	-	-	-	-	Picrite	Picrite
KCB	KAX-14-124	63.8	83.5	1 E-07	-	-	-	-	-	-	-	-	-	Picrite	Picrite
KCB	KAX-14-124	44.3	50.5	2 E-07	-	-	-	-	-	-	-	-	-	Picrite	Picrite
KCB	KAX-14-124	137.3	166.0	9 E-10	-	-	-	-	-	-	-	-	-	Picrite	Picrite
KCB	KAX-14-124	116.3	136.0	3 E-09	-	-	-	-	-	-	-	-	-	Picrite	Picrite
KCB	KAX-14-124	33.8	43.0	6 E-09	-	-	-	-	-	-	-	-	-	Picrite	Picrite
KCB	KAX-14-124	57.8	65.5	8 E-09	-	-	-	-	-	-	-	-	-	Picrite	Picrite
KCB	KAX-14-124	86.3	103.0	3 E-07	-	-	-	-	-	-	-	-	-	Picrite	Picrite
KCB	KAX-14-128	65.1	81.8	2 E-07	-	-	-	-	-	-	-	-	-	Nicola Group Volcanics and Sediments	NV
KCB	KAX-14-128	111.1	131.0	4 E-10	-	-	-	-	-	-	-	-	-	Picrite	Picrite
KCB	KAX-14-128	95.1	110.3	4 E-08	-	-	-	-	-	-	-	-	-	Picrite	Picrite
KCB	KAX-14-128	156.1	174.8	7 E-09	-	-	-	-	-	-	-	-	-	Sugarloaf Diorite	SLD
KCB	KAX-14-130	36.8	44.5	5 E-09	-	-	-	-	-	-	-	-	-	Picrite	Picrite
KCB	KAX-14-130	189.8	226.0	5 E-09	-	-	-	-	-	-	-	-	-	Nicola Group Volcanics and Sediments	NV
KCB	KAX-14-130	83.3	109.0	1 E-09	-	-	-	-	-	-	-	-	-	Nicola Group Volcanics and Sediments	NV
KCB	KAX-14-130	110.3	137.5	4 E-09	-	-	-	-	-	-	-	-	-	Nicola Group Volcanics and Sediments	NV
KCB	KAX-14-130	138.8	169.0	4 E-09	-	-	-	-	-	-	-	-	-	Nicola Group Volcanics and Sediments	NV
KCB	KAX-14-130	71.3	83.5	1 E-08	-	-	-	-	-	-	-	-	-	Picrite	Picrite
KCB	KAX-14-130	159.8	168.8	1 E-08	-	-	-	-	-	-	-	-	-	Nicola Group Volcanics and Sediments	NV
KCB	KAX-14-130	56.3	64.3	8 E-08	-	-	-	-	-	-	-	-	-	Nicola Group Volcanics and Sediments	NV
KCB	KAX-14-130	65.1	81.8	4 E-08	-	-	-	-	-	-	-	-	-	Picrite	Picrite
Klohn (1988)	DDH88-7	49.4	80.0	2 E-09	-	-	-	-	-	-	-	-	-	Nicola Group Volcanics and Sediments	NV
Klohn (1988)	DDH88-7	43.3	80.0	3 E-09	-	-	-	-	-	-	-	-	-	Nicola Group Volcanics and Sediments	NV
Klohn (1988)	DDH88-7	37.2	80.0	3 E-09	-	-	-	-	-	-	-	-	-	Nicola Group Volcanics and Sediments	NV
Klohn (1988)	DDH88-7	31.1	80.0	2 E-09	-	-	-	-	-	-	-	-	-	Nicola Group Volcanics and Sediments	NV
Klohn (1988)	R88-1	-	-	-	4.5	8.5	5 E-07	-	-	-	-	-	-	Glacial Till, Diamicton and Undivided Glacial Material	Till
KCB	KAX-14-114S	-	-	-	22.0	31.1	1 E-06	-	-	-	-	-	-	Fluvial and Glaciofluvial Sands and Gravels	Sand/Gravel
KCB	KAX-14-128S	-	-	-	10.9	17.0	2 E-06	-	-	-	-	-	-	Fluvial and Glaciofluvial Sands and Gravels	Sand/Gravel
KCB	KAX-14-128S	-	-	-	10.9	17.0	1 E-07	-	-	-	-	-	-	Lacustrine and Glaciolacustrine Deposits and Undivided Recent Lake Sediments	lacustrine
Klohn (1988)	R88-1	-	-	-	14.0	19.5	2 E-07	-	-	-	-	-	-	Glacial Till, Diamicton and Undivided Glacial Material	Till
Klohn (1988)	R88-1	-	-	-	53.5	61.0	2 E-09	-	-	-	-	-	-	Nicola Group Volcanics and Sediments	NV
Klohn (1988)	R88-2	-	-	-	0.0	4.6	2 E-06	-	-	-	-	-	-	Glacial Till, Diamicton and Undivided Glacial Material	Till
Klohn (1988)	R88-2	-	-	-	8.0	13.0	4 E-07	-	-	-	-	-	-	Glacial Till, Diamicton and Undivided Glacial Material	Till

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Consultant	Drillhole ID	Packer Tests			Falling/Rising Head Slug			Pumping Tests				Pump-In Tests		Interpreted Hydrostratigraphic Unit	Logged Lithology
		Packer Zone		K	Screened Zone		K	Screened Zone		VWP Installation Depth	K	Test Depth	K		
		From (mbgs)	To (mbgs)	(m/s)	From (mbgs)	To (mbgs)	(m/s)	From (mbgs)	To (mbgs)	(mah)	(m/s)	(mbgs)	(m/s)		
Klohn (1988)	R88-2	-	-	-	34.0	40.0	5 E-09	-	-	-	-	-	-	Nicola Group Volcanics and Sediments	NV
Klohn (1988)	R88-4	-	-	-	0.0	3.0	3 E-07	-	-	-	-	-	-	Glacial Till, Diamicton and Undivided Glacial Material	Till
Klohn (1988)	R88-4	-	-	-	3.1	6.1	3 E-07	-	-	-	-	-	-	Glacial Till, Diamicton and Undivided Glacial Material	Till
Klohn (1988)	R88-4	-	-	-	10.7	10.7	1 E-05	-	-	-	-	-	-	Glacial Till, Diamicton and Undivided Glacial Material	Till
Klohn (1988)	R88-4	-	-	-	11.0	17.0	9 E-08	-	-	-	-	-	-	Glacial Till, Diamicton and Undivided Glacial Material	Till
Klohn (1988)	TP-3	-	-	-	0.0	3.0	2 E-05	-	-	-	-	-	-	Fluvial and Glaciofluvial Sands and Gravels	Sand/Gravel
Klohn (1988)	TP-5	-	-	-	0.0	3.0	4 E-06	-	-	-	-	-	-	Fluvial and Glaciofluvial Sands and Gravels	Sand/Gravel
Klohn (1988)	TP-8B	-	-	-	0.0	3.0	2 E-07	-	-	-	-	-	-	Glacial Till, Diamicton and Undivided Glacial Material	Till
Klohn (1988)	TP-11	-	-	-	0.0	3.0	6 E-08	-	-	-	-	-	-	Glacial Till, Diamicton and Undivided Glacial Material	Till
Piteau	UA 101	206.7	331.6	9 E-08	-	-	-	-	-	-	-	-	-	Nicola Group Volcanics and Sediments	NV
		103.0	331.6	1 E-07										Nicola Group Volcanics and Sediments	NV
		32.9	331.6	2 E-11										Nicola Group Volcanics and Sediments	NV
Piteau	BH-V1-P1	-	-	-	33.4	34.9	3 E-06	-	-	-	-	-	-	Undivided Bedrock	Bedrock
Piteau	BH-V1-P2	-	-	-	23.3	24.8	5 E-06	-	-	-	-	-	-	Undivided Bedrock	Bedrock
Piteau	BH-V2-P1	-	-	-	73.8	75.3	4 E-10	-	-	-	-	-	-	Undivided Bedrock	Bedrock
Piteau	BH-V2-P2	-	-	-	61.0	62.5	2 E-08	-	-	-	-	-	-	Glacial Till, Diamicton and Undivided Glacial Material	Till
Piteau	BH-V3-P2	-	-	-	38.7	40.2	5 E-09	-	-	-	-	-	-	Mine Rock and Anthropogenic Materials	Waste Rock
Piteau	BH-V4	-	-	-	19.5	21.0	2 E-06	-	-	-	-	-	-	Glacial Till, Diamicton and Undivided Glacial Material	Till
Piteau	BH-V5	-	-	-	30.2	31.7	3 E-08	-	-	-	-	-	-	Undivided Bedrock	Bedrock
Piteau	BH-V6-P1	-	-	-	28.7	30.2	2 E-08	-	-	-	-	-	-	Undivided Bedrock	Bedrock
Piteau	BH-V6-P2	-	-	-	10.4	12.0	1 E-10	-	-	-	-	-	-	Glacial Till, Diamicton and Undivided Glacial Material	Till
Piteau	BH-V8-P1	-	-	-	101.8	103.3	2 E-08	-	-	-	-	-	-	Undivided Bedrock	Bedrock
Piteau	BH-V8-P2	-	-	-	89.3	90.8	8 E-09	-	-	-	-	-	-	Mine Rock and Anthropogenic Materials	Waste Rock
Piteau	PA-1-P1	-	-	-	28.7	30.2	2 E-09	-	-	-	-	-	-	Undivided Bedrock	Bedrock
Piteau	PA-1-P2	-	-	-	20.7	22.3	5 E-07	-	-	-	-	-	-	Glacial Till, Diamicton and Undivided Glacial Material	Till
Piteau	PA-2-P1	-	-	-	43.9	45.4	1 E-08	-	-	-	-	-	-	Undivided Bedrock	Bedrock
Piteau	PA-2-P2	-	-	-	5.8	7.3	7 E-09	-	-	-	-	-	-	Glacial Till, Diamicton and Undivided Glacial Material	Till
Piteau	PA-3-P1	-	-	-	43.9	45.4	4 E-07	-	-	-	-	-	-	Undivided Bedrock	Bedrock
Piteau	PA-3-P2	-	-	-	27.4	29.0	3 E-09	-	-	-	-	-	-	Undivided Bedrock	Bedrock
Piteau	BH-V1	-	-	-	-	-	-	-	-	-	-	5.6	2 E-04	Mine Rock and Anthropogenic Materials	Waste Rock
Piteau	BH-V1	-	-	-	-	-	-	-	-	-	-	11.6	5 E-04	Mine Rock and Anthropogenic Materials	Waste Rock
Piteau	BH-V1	-	-	-	-	-	-	-	-	-	-	21.4	7 E-07	Undivided Bedrock	Bedrock
Piteau	BH-V2	-	-	-	-	-	-	-	-	-	-	6.1	8 E-04	Mine Rock and Anthropogenic Materials	Waste Rock
Piteau	BH-V2	-	-	-	-	-	-	-	-	-	-	12.1	8 E-04	Mine Rock and Anthropogenic Materials	Waste Rock
Piteau	BH-V2	-	-	-	-	-	-	-	-	-	-	18.3	1 E-08	Mine Rock and Anthropogenic Materials	Waste Rock
Piteau	BH-V2	-	-	-	-	-	-	-	-	-	-	23.4	1 E-08	Glacial Till, Diamicton and Undivided Glacial Material	Till
Piteau	BH-V2	-	-	-	-	-	-	-	-	-	-	30.5	1 E-08	Glacial Till, Diamicton and Undivided Glacial Material	Till
Piteau	BH-V3	-	-	-	-	-	-	-	-	-	-	15.1	6 E-05	Mine Rock and Anthropogenic Materials	Waste Rock
Piteau	BH-V3	-	-	-	-	-	-	-	-	-	-	9.2	7 E-05	Mine Rock and Anthropogenic Materials	Waste Rock
Piteau	BH-V3	-	-	-	-	-	-	-	-	-	-	21.3	2 E-05	Mine Rock and Anthropogenic Materials	Waste Rock
Piteau	BH-V3	-	-	-	-	-	-	-	-	-	-	27.4	2 E-05	Mine Rock and Anthropogenic Materials	Waste Rock
Piteau	BH-V3	-	-	-	-	-	-	-	-	-	-	33.5	5 E-04	Mine Rock and Anthropogenic Materials	Waste Rock
Piteau	BH-V3	-	-	-	-	-	-	-	-	-	-	41.1	1 E-08	Glacial Till, Diamicton and Undivided Glacial Material	Till
Piteau	BH-V4	-	-	-	-	-	-	-	-	-	-	13.7	2 E-06	Undivided Bedrock	Bedrock
Piteau	BH-V8	-	-	-	-	-	-	-	-	-	-	9.1	2 E-04	Mine Rock and Anthropogenic Materials	Waste Rock
Piteau	BH-V8	-	-	-	-	-	-	-	-	-	-	15.3	3 E-04	Mine Rock and Anthropogenic Materials	Waste Rock
Piteau	BH-V8	-	-	-	-	-	-	-	-	-	-	21.3	3 E-05	Mine Rock and Anthropogenic Materials	Waste Rock
Piteau	BH-V8	-	-	-	-	-	-	-	-	-	-	33.5	3 E-07	Mine Rock and Anthropogenic Materials	Waste Rock
Piteau	BH-V8	-	-	-	-	-	-	-	-	-	-	39.6	1 E-05	Mine Rock and Anthropogenic Materials	Waste Rock
Piteau	BH-V8	-	-	-	-	-	-	-	-	-	-	54.9	3 E-05	Mine Rock and Anthropogenic Materials	Waste Rock
Piteau	BH-V8	-	-	-	-	-	-	-	-	-	-	64.0	2 E-07	Mine Rock and Anthropogenic Materials	Waste Rock
Piteau	BH-V8	-	-	-	-	-	-	-	-	-	-	82.3	8 E-08	Mine Rock and Anthropogenic Materials	Waste Rock

Notes:
1. SLD = Sugarloaf Diorite, IMH = Iron Mask Hybrid, NVV = Nicola Volcanics, NVP = Picrite, Bedrock = Undifferentiated Bedrock, ' Overburden = Undifferentiated Overburden, Ovb/Br = Overburden/Bedrock, GF = Glaciofluvial
2. m bgs = metres below ground surface, mah = metres along hole, "-" = not applicable

Table 4. Average Monthly Climate Data for Ajax (KP, 2014a)

Month	Average Temperature (°C)	Average Rainfall (mm)	Snow Water Equivalent (mm)	Average Precipitation (mm)	PET (mm)
January	-4.5	2.3	21.1	23.4	0
February	-2.4	2.9	11.6	14.5	1
March	1.5	4.2	7.7	11.9	12
April	6.5	16.3	2.8	19.2	40
May	11.1	32.8	0	32.8	77
June	14.7	43.4	0	43.4	103
July	18.7	42.4	0	42.4	130
August	17.8	32	0	32	114
September	12.9	35.8	0	35.8	71
October	5.6	13.2	2.3	15.5	28
November	-0.1	5.6	22.4	28	3
December	-4.9	3.7	33.3	37	0
Average/Total	**6.4**	**235**	**101**	**336**	**579**

Notes:
1. PET = Potential Evapotranspiration.

Table 5. Bedrock Geology Units in the Ajax Study Area

Main Rock Type	Age (Epoch)	Stratigraphic Unit		Symbol	Rock Type	Description	Study Area
		Group	Formation				
Sedimentary and Volcanic	Miocene	-	-	Mivb	Basaltic volcanic rocks	Olivine basalt	LSA
	Eocene	Kamloops Group	-	EKav	Undivided volcanic rocks	Basalt, andesite, dacite, trachyte, rhyolite; related tuffs and breccias; minor amounts of mudstone, shale, sandstone and conglomerate; includes Dewdrop Flats Formation	LSA
			Tranquille Formation	EKaT	Mudstone, siltstone, shale fine clastic sedimentary rocks	Lacustrine mudstone and siltstone, tuffaceous siltstone, andesitic flows and tuffs; volcanic breccia and lahar; local lithic-arkosic wacke, organic-rich shale and minor coal	RSA
	Upper Triassic	Nicola Group	Eastern Volcanic Facies	uTrNE	Basaltic volcanic rocks	Mafic breccia and tuff with augite and hornblende-phyric clasts; local intercalated argillite	LSA
			-	uTrNsf	Mudstone, siltstone, shale fine clastic sedimentary rocks	Sedimentary facies: shale, argillite, siltstone, sandstone, phyllite, tuff; local polymict conglomerate, limestone, greenstone and chloritic phyllite	RSA
			-	uTrNml	Lower amphibolite/kyanite grade metamorphic rocks	Amphibolite, foliated diorite, mylonite and chlorite schist derived from Nicola Group	LSA
	Devonian to Permian	Harper Ranch Group	-	DPHsf	Mudstone, siltstone, shale fine clastic sedimentary rocks	Argillite, cherty argillite, siltstone, volcanic and chert-grain sandstone; chert-pebble conglomerate; volcaniclastic rocks of mafic to felsic composition; minor carbonate	RSA
Intrusive	Eocene	-	Battle Bluff Plutonic Complex	EBB	Diabase, basaltic intrusive rocks	Diabase	RSA
			-	Efp	Feldspar porphyritic intrusive rocks	Hornblende-biotite-quartz-feldspar porphyry, hornblende-feldspar porphyry, quartz-feldspar porphyry	RSA
	Late Triassic to Early Jurassic	Iron Mask Batholith	Cherry Creek Unit	LTrJIC	Dioritic intrusive rocks	Diorite, monzonite, syenite; includes Cherry Creek pluton	LSA
			Sugarloaf Unit	LTrJIS	Dioritic intrusive rocks	Porphyritic hornblende ± augite microdiorite; minor andesitic dikes	LSA
			Pothook Unit	LTrJIP	Dioritic intrusive rocks	Medium to coarse-grained diorite and gabbro	LSA
			Hybrid Unit	LTrJIH	Dioritic intrusive rocks	Agmatite consisting of abundant diorite, gabbro and hornblendite fragments in a fine-grained dioritic matrix; locally includes minor amounts of Pothook, Sugarloaf and Cherry Creek units	LSA
		-	-	LTrJgd	Granodioritic intrusive rocks	Granodiorite, quartz diorite, quartz monzonite; lesser monzonite, diorite and gabbro	RSA
			-	LTrJum	Ultramafic rocks	Ultramafic rocks, commonly associated with alkalic intrusions; includes dunite, wehrlite, pyroxenite, gabbro;	LSA

Notes:
1. Compiled from Massey et. al. (2005).

Table 6. Surficial Geologic Units Mapped in the Ajax Study Area

Age	Geologic Event	Depositional Environment / Sedimentary Facies[1]	Deposit Type/Sub Unit	Symbol	Description[2]	Study Area	Topographic Locations	Data Source
Quaternary	Recent, human activity	Anthropogenic	-	An	Sufficiently reworked or redistributed by human activities that their original character is lost (e.g., gravel pits and fill used for roads and other construction)	LSA	Historic waste rock and tailings from mining at Afton and Ajax; Mining haul road	Keystone (2008); KP (2014)
	Post-Fraser Glaciation	Lacustrine	Lacustrine	Ld, Lp, Lv	Stratified fine sands, silts and clays, in depressions (Ld), plains (Lp), veneer (Lv)	LSA	Shallow ponds throughout project area	Keystone (2008)
		Fluvial	Modern Alluvium	A	Sand, gravel, silt, and minor muck and peat; at or near present base level (floodplain, channel, delta and shoreline deposits)	RSA	Valley bottom, lake shore	Fulton (1975)
			Fan Deposits	Ff, Fp, Ft, Fj, Fv	Loosely packed, non-cohesive sands and silts with some gravel; Generally mapped as fans (Ff), floodplains (Fp), terraces (Ft), gentlly sloping fluvial areas (Fj) and veneers (Fv) with imperfect to poor drainage	LSA	Humphrey Creek, Peterson Creek and Alkali Creek	Keystone (2008); KP (2014)
				F	Poorly sorted gravel, sand, silt and clay	RSA	Valley side, changes in stream gradient, stream junction	Fulton (1975)
		Eolian	Eolian	E	Silts and fine sands; Typically occur as a thin cap over other materials, but may locally thicken into blankets or dunes	LSA	Typically downwind from a large source of fine-grained soils, such as glaciolacustrine sediments; Afton area; North of Peterson Creeek Aquifer	Keystone (2008)
		Colluvial / Mass movement	Landslide Deposits	S	Blocks and rubble, mainly bedrock	RSA	High relief areas of tertiary bedrock	Fulton (1975)
			Colluvium	C	Loose, unconsolidated sediments forming talus slopes as a result of rockfall from bedrock bluffs, soil creep in weathered bedrock, mass movement processes in surficial materials (debris flows and debris slides) or rockslides/rock slumps.	LSA	Sugarloaf Hill; Steep slopes of bedrock hummocks; Mined open pits; Slump/earthflows mapped north of Highway 1	Keystone (2008)
		Bog	Bog deposits	B	Muck, mucky peat, marl and peat	RSA	Closed depressions, seepage areas	Fulton (1975)
			Organics	O	Decayed plant material	LSA	Thin veneers in wetlands; Uncommon in study area	Keystone (2008)
	Fraser Glaciation Kamloops Lake Drift	Glaciolacustrine	Lacustrine Deposits, Undifferentiated	L, LGu, LGp, Lgu	Silt, Clay and sand; LGu, undulating topography, LGp, plains, LGa, moderate slopes	RSA	Valleys	Fulton (1975); Keystone (2008)
			Lacustrine Deposits	Lt, Li	Silt with minor clay and sand; Lt, deposits thick enough to mask underlying topography (generally more than 10 feet thick); Li, thin veneer not masking underlying topography (generally less than 10 feet thick)	RSA	Valleys	Fulton (1975)
			Lacustrine Complex	Lx	Silt, sand and gravel; complex of deep water and shoreline deposits and features	RSA	Valleys	Fulton (1975)
			Collapsed Lacustrine Deposits	Lc	Silt, sand, clay and minor gravel; ridged and kittled deposits disrupted by melting of underlying ice	RSA	Valleys	Fulton (1975)
		Glaciofluvial	Terrace Deposit; Stream terrace	Ts	Gravel, sandy gravel and sand	RSA	Valley sides and bottoms	Fulton (1975)
			Terrace Deposit; Delta Terrace	Td	Gravel, sandy gravel and sand	LSA	Valley sides and bottoms	Fulton (1975)

Table 6. Surficial Geologic Units Mapped in the Ajax Study Area

Age	Geologic Event	Depositional Environment / Sedimentary Facies[1]	Deposit Type/Sub Unit	Symbol	Description[2]	Study Area	Topographic Locations	Data Source
Quaternary	Fraser Glaciation Kamloops Lake Drift	Glaciofluvial	Kettle Terrace Deposits	Tk	Gravel, sandy gravel , and sand; terrace broken by kettle holes; includes kettled stream terrace, kame terrace; and kettled delta terrace	LSA	Valley sides and bottoms	Fulton (1975); KP (2014)
				FG, FGt, FGp, FGv	Glaciofluvial (GF) Highly porous and permeable sands and gravels, terrace (FGt), plains (FGp) and veneer (FGv)	LSA	Humphrey Creek, Peterson Creek, Keynes Creek and Alkali Creek	Keystone (2008); KP (2014)
			Rill Complex	W	Lag gravels, channel-bottom gravels, areas of unmodified till, small areas of hummocky gravel, and local pockets of backwater silt (in general morainal deposits washed and channelled by meltwater)	LSA	Valley slopes	Fulton (1975)
				FGk, Fga, FGj, Fgu	Highly porous and permeable sands and gravels, undulating topography (Fgu) erosional slopes (FGk), gentle slopes (FGj) and moderate slopes (FGa)	LSA	Humphrey Creek, Peterson Creek, Keynes Creek and Alkali Creek	Keystone (2008)
			Hummocky Gravels	H	Poorly sorted gravel and sand characterized by irregular hummocks and kettles; includes kames and eskers	LSA	Valley bottom and sides	Fulton (1975); KP (2014)
		Glacial Till	Morainal Deposits	M, Mr	Till with minor sand, gravel and silt; M, undifferentiated; Mr, ridged (characterized by sharp ridges and kettles)	LSA	Valley sides, areas of low to moderate relief; Mid to upper slopes of scattered hills (e.g., Sugarloaf Hill); Areas of undulating bedrock	Fulton (1975); Keystone (2008)
	-	Undivided Deposits	-	U	Mainly undifferentiated morainal deposits but may contain small areas of younger deposits (forested areas mapped largely by air photo interpretation)	LSA	Mapped throughout RSA	Fulton (1975); Golder (2008)
	-	-	Gypsum Spring	-	Bedded gypsum and swelling clays, smectite-montmorillonite	RSA	Aberdeen	Read (1998)
-	-	Rock Outcrop/Near Surface Rock	Weathered Bedrock	D	Bedrock modified by mechanical and chemical weathering; Angular coarse fragments with varying amounts of interstitial silty sand; Non-cohesive and rapidly to very rapidly drained	LSA	Overlies gently sloping or undulating bedrock outcrops	Keystone (2008)
			Bedrock Outcrop	R	Rock outcrop and areas of near-surface rock	LSA	Mapped throughout RSA	Fulton (1975); Keystone (2008); KP (2014)

Notes:

1. Interpretation of hydrostratigraphic units within the RSA was based primarily on depositional environment / sedimentary facies described by Fulton (1975) and Keystone (2008).
2. Material descriptions taken directly from Fulton (1975) regional mapping, Keystone (2008) GIS dataset and report and from metadata within KP (2014) GIS dataset.

Table 7. Details of Mapped Aquifers within the RSA

Aquifer Class	Name	Aquifer No.	Materials	Productivity	Vulnerability	Demand	Ranking Value	Description	Lithology / Stratigraphy	Area (km^2)	No. of Registered Wells Interpreted to be Screened within Aquifer[1]	Well Usage Type in Registered Wells (Number of Wells)						
												Private Domestic	Irrigation	Observation Well	Commercial and Industrial	Water Supply System	Abandoned	Unknown
IB	728 IB (14)	0728	Sand and Gravel	Moderate	Moderate	High	14	Cherry Cr valley; SW of Kamloops	-	8	67	37	3	0	0	0	2	25
IIA	284 IIA (11)	0284	Sand and Gravel	Moderate	High	Moderate	11	Pulmill southwest of Kamloops	Recent alluvial deposits	2	10	3	0	0	0	0	0	7
IIB	277 IIB (9)	0277	Sand and Gravel	Moderate	Moderate	Moderate	9	Davidson Creek	Kamloops drift	1	10	8	0	0	0	0	0	2
IIB	285 IIB (10)	0285	Sand and Gravel	Moderate	Moderate	Moderate	10	Campbell Creek	Recent alluvial and older Kamloops Drift	3	26	7	0	0	0	0	0	19
IIB	286 IIB (13)	0286	Sand and Gravel	High	Moderate	Moderate	13	Lower South Thompson River	Recent alluvial and older Kamloops Drift	33	9	2	0	0	0	0	0	7
IIB	727 IIB (12)	0727	Bedrock	Low	Moderate	Moderate	12	Cherry Cr valley; SW of Kamloops	-	30	85	63	1	0	0	0	0	21
IIC	275 IIC (7)	0275	Bedrock	Low	Low	Moderate	7	Knutsford	Kamloops Group	1	12	10	0	0	0	0	0	2
IIC	280 IIC (8)	0280	Sand and Gravel	Moderate	Low	Moderate	8	2 km west of Barnhartvale	Kamloops Drift; Pre-Fraser glacial and non-glacial deposits	1	13	1	0	0	0	0	0	12
IIIA	278 IIIA (9)	0278	Sand and Gravel	Moderate	High	Low	9	Peterson Creek	Kamloops drift	2	7	6	0	0	0	0	0	1
IIIB	273 IIIB (10)	0273	Bedrock	Low	Moderate	Low	10	Rose Hill / Barnhartvale / Shumway Lake	Cache Creek and Nicola Groups	173	85	37	1	0	0	0	1	46
IIIB	274 IIIB (9)	0274	Bedrock	Low	Moderate	Low	9	Brigade Lake	Kamloops Group	76	9	8	0	0	0	0	0	1
IIIB	276 IIIB (10)	0276	Bedrock	Low	Moderate	Low	10	Sugarloaf Hill southwest of Kamloops	Coast Intrusions: Iron Mask Batholith	65	16	6	0	1	2	0	1	6
IIIB	283 IIIB (11)	0283	Sand and Gravel	Moderate	Moderate	Low	11	North Thompson River north of Kamloops	Modern alluvium and Fan deposits	79	26	2	1	0	0	0	0	23

Notes:
1. Registered wells from WRBC database search.

Table 8. Assessment of Vertical Hydraulic Gradients and Artesian Conditions in the Project Area

Direction of Flow	Deep Completion ID	Shallow Completion ID	Deep Completion Hydrostratigraphic Unit	Shallow Completion Hydrostratigraphic Unit	Average	Maximum	Minimum	Standard Deviation	Number of Available Measurements[2]	General Monitoring Location	Flowing Artesian[3]	Comments	Hydrograph Figure No. (Appendix F)
Downward	BGC14-005	BGC13-022	IRON MASK HYBRID	GLACIAL TILL	0.063	0.152	0.018	0.077	3	EMRSF	No	Limited amount of concurrent measurements for gradient assessment; suggest installing datalogger in BGC13-022	10
	MW11-05D	MW11-05S	IRON MASK HYBRID	IRON MASK HYBRID	0.198	0.214	0.169	0.012	821	EMRSF	No	-	13
	MW11-10D	MW11-10S	FLUVIAL / GLACIOFLUVIAL	FLUVIAL / GLACIOFLUVIAL	0.113	0.136	0.069	0.020	278	EMRSF	No	Qualitative; water levels in MW11-10S still recovering since installation	14
	BGC14-007D	BGC14-007S	NICOLA GROUP VOLCANICS	GLACIAL TILL	0.987	1.010	0.976	0.010	172	SMRSF	No	Qualitative; water levels still recovering from installation	15
	BGC14-008D	BGC14-008S	IRON MASK HYBRID	FLUVIAL / GLACIOFLUVIAL	0.859	0.887	0.831	0.018	132	SMRSF	No	Qualitative; water levels still recovering from installation	16
	BGC14-014D	BGC14-014S	NICOLA GROUP VOLCANICS	GLACIAL TILL	0.197	0.205	0.193	0.003	33	SMRSF	No	-	19
	MW11-08D	MW11-08S	NICOLA GROUP VOLCANICS	GLACIAL TILL	0.198	0.203	0.192	0.002	942	JACKO LAKE SOUTH	No	-	25
	AW-09-103-D	AW-09-103-S	PICRITE	NICOLA VOLCANICS	0.194	0.215	0.170	0.010	322	OPEN PIT SOUTHWEST WALL	No	Note inclined hole; gradient is approximate	26
	BGC10-MWA-125	BGC10-MWA-075	SUGARLOAF DIORITE	GLACIAL TILL	0.059	0.073	0.048	0.005	423	OPEN PIT SOUTHWEST WALL	No	-	27
	BGC10-MWA-175	BGC10-MWA-125	SUGARLOAF DIORITE	SUGARLOAF DIORITE	0.045	0.054	0.030	0.007	421	OPEN PIT SOUTHWEST WALL	No	-	27
	BGC10-MWB-125	BGC10-MWB-075	SUGARLOAF DIORITE	GLACIAL TILL	0.032	0.055	-0.079	0.013	564	OPEN PIT SOUTHWEST WALL	No	-	28
	BGC10-MWB-175	BGC10-MWB-125	SUGARLOAF DIORITE	SUGARLOAF DIORITE	0.006	0.007	0.001	0.002	566	OPEN PIT SOUTHWEST WALL	No	-	28
	KAX-13-004-D	KAX-13-004-S	NICOLA VOLCANICS	NICOLA VOLCANICS	0.032	0.034	0.030	0.001	854	OPEN PIT SOUTHWEST WALL	No	Note inclined hole; gradient is approximate	29
	KAX-13-007-D	KAX-13-007-S	IRON MASK HYBRID	NICOLA VOLCANICS	0.039	0.041	0.033	0.001	1184	OPEN PIT SOUTHWEST WALL	No	Note inclined hole; gradient is approximate	30
	AJGW02-D	AJGW02-S	NICOLA GROUP VOLCANICS	GLACIAL TILL	0.487	0.726	0.421	0.048	609	OPEN PIT AREA	No	Note wells sensitive to rainfall/surface recharge	32
	AW-10-105-D	AW-10-105-S	IRON MASK HYBRID	IRON MASK HYBRID / SUGARLOAF DIORITE	0.086	0.093	0.078	0.004	435	OPEN PIT AREA	No	Note inclined hole; gradient is approximate	38
	AM-10-061-D	AM-10-061-S	SUGARLOAF DIORITE	PICRITE	0.089	0.095	0.052	0.005	424	OPEN PIT EAST	No	Note inclined hole; gradient is approximate	40
	MW11-01D	MW11-01S	IRON MASK HYBRID	GLACIAL TILL	0.121	0.243	0.051	0.054	564	PROJECT SITE WEST	No	Qualitative; water levels in MW11-01D still recovering since installation	43
	MW11-03D	MW11-03S	NICOLA GROUP VOLCANICS	GLACIAL TILL	0.230	0.341	0.168	0.042	492	PROJECT SITE WEST	No	Qualitative; water levels in MW11-03D still recovering since installation	45

Table 8. Assessment of Vertical Hydraulic Gradients and Artesian Conditions in the Project Area

Direction of Flow	Deep Completion ID	Shallow Completion ID	Deep Completion Hydrostratigraphic Unit	Shallow Completion Hydrostratigraphic Unit	Average	Maximum	Minimum	Standard Deviation	Number of Available Measurements[2]	General Monitoring Location	Flowing Artesian[3]	Comments	Hydrograph Figure No. (Appendix F)
Upward	BGC14-002D	BGC14-002S	NICOLA GROUP VOLCANICS	GLACIAL TILL	-0.007	-0.005	-0.011	0.001	183	TSF	No	-	2
	BGC14-003D	BGC14-003I	NICOLA GROUP VOLCANICS	FLUVIAL / GLACIOFLUVIAL	-0.042	-0.027	-0.047	0.006	105	TSF	No	-	3
	BGC14-003I	BGC14-003S	FLUVIAL / GLACIOFLUVIAL	GLACIAL TILL	-0.004	-0.002	-0.006	0.001	183	TSF	No	-	3
	BGC14-011D	BGC14-011S	NICOLA GROUP VOLCANICS	NICOLA GROUP VOLCANICS	-0.001	0.000	-0.002	0.001	168	TSF	No	-	5
	BGC14-012D	BGC14-012S	NICOLA GROUP VOLCANICS	COLLUVIUM	-0.008	-0.004	-0.011	0.002	170	TSF	Yes - BGC14-012D only	-	6
	BGC14-017D	BGC14-017S	NICOLA GROUP VOLCANICS	GLACIAL TILL	-0.051	-0.030	-0.064	0.012	92	TSF	Yes	Qualitative; water levels in BGC14-017D are above top of PVC	8
	BGC14-004	BGC13-021	IRON MASK HYBRID	FLUVIAL / GLACIOFLUVIAL	-0.028	-0.027	-0.029	0.001	2	EMRSF	No	Limited amount of concurrent measurements for gradient assessment; suggest installing datalogger in BGC13-021	9
	BGC14-006D	BGC14-006S	IRON MASK HYBRID	GLACIAL TILL	-0.057	-0.023	-0.071	0.019	91	EMRSF	No	Qualitative; water levels still recovering from installation	11
	BGC14-015D	BGC14-015S	NICOLA GROUP VOLCANICS	GLACIAL TILL	-0.026	-0.025	-0.027	0.000	27	SMRSF	Yes	-	20
	MW11-04D	MW11-04S	IRON MASK HYBRID	IRON MASK HYBRID	-0.258	-0.234	-0.314	0.010	684	JACKO LAKE NORTH	Yes - MW11-04D only	-	23
	MW11-07D	MW11-07S	IRON MASK HYBRID	IRON MASK HYBRID	-0.020	-0.005	-0.030	0.005	831	JACKO LAKE NORTH	Yes - MW11-07D only	-	24
	AJGW07-D	AJGW07-S	NICOLA GROUP VOLCANICS	FLUVIAL / GLACIOFLUVIAL	-0.013	0.000	-0.028	0.007	559	OPEN PIT AREA	No	Note wells sensitive to rainfall/surface recharge	37
	MW11-09D	MW11-09S	NICOLA GROUP VOLCANICS	NICOLA GROUP VOLCANICS	-0.099	-0.096	-0.102	0.004	2	PROJECT SITE WEST	No	Limited amount of concurrent measurements for gradient assessment; suggest installing datalogger in MW11-09D	46

Notes:
1. Negative sign indicates potential upward component of flow.
2. Number of available measurements reflects multiple measurements per well.
3. Artesian conditions also noted in DH-BGC11-ND-04 and MW11-06D/S. Continuous data were not available for vertical gradient assessment at MW11-06S/D
4. Hydraulic gradients calculated for piezometers installed at KAX-13-004-D/S, 007-D/S and AW-09-103-D/S, AW-10-105-D/S and AM-10-061-D/S are approximate as VWPs are installed into inclined holes. The magnitude of the gradients at the coordinate location of drill collars for these holes would likely be less than is reported above.

Table 9. Summary of Estimated Groundwater Inputs and Outputs

Groundwater Inputs		Representative Values	Area	Methods/Source/Notes
Meteoric recharge		0.3 to 8 mm/yr	LSA	Chloride mass balance (this assessment), HYDRUS-1D modelling (BGC, 2015f).
Irrigation	Golf Course	135 to 336 mm/yr	RSA	Potential source of groundwater recharge. Estimate for the Aberdeen area, outside of LSA (Golder 2008a).
	Irrigation	2 Mm^3/yr	LSA	Potential irrigation based on surface water licences within the Peterson Creek Watershed (BGC, 2015d).

Groundwater Outputs		Representative Values	Area	Methods/Source/Notes
Evapotranspiration		524 to 584 mm/yr	LSA	Estimated by KP (2014a) using average monthly site data.
Baseflows		0 to 178 mm/yr	LSA	Estimated based on observed flows in creeks within the LSA from July through November (KP (20143b), BGC (2015d)).
Pumping	Aberdeen DWMS	70 m^3/day	RSA	Estimate for the Aberdeen area, outside of LSA (Golder 2008a).
	Domestic	60 to 140 m^3/day	LSA	Estimated based on number of registered water wells within the LSA and average household well use for Kamloops (BC MoE (2013b, 2014), City of Kamloops (2013b), Environment Canada (2013), Statistics Canada (2011)).

Table 10. Summary of Groundwater Recharge Estimates from Previous Hydrogeological Studies

Source	Location	Estimation Method	Ground Elevation (m asl)	Average Estimated Infiltration	
				(mm/yr)	(% MAP[1])
Piteau (2006)	Afton Area	Assumed / Model Calibration	646 to 770	4.9	1.6%
Golder (2008)	Goose Lake	CMB[2]	960.1	2.0	0.5%
	Edith Lake		1021.1	2.2	0.5%
	MacLeod Lake		1066.8	1.8	0.5%
	Lodgepole		1414.3	35.2	7.8%
	Chuwhels		1828.8	99.0	21.9%

Notes:
1. Mean annual precipitation (MAP).
2. Chloride mass balance (CMB) method described in Healy (2010).

Table 11. Infiltration Rates calculated by Golder (2008a) for various Elevation Bands and Precipitation Rates

Period	Precipitation at Climate Station	350 to 700 m asl				700 to 900m asl				900 to 1200m asl				1200 to 1828 m asl			
		Precipitation		Infiltration		Precipitation		Infiltration		Precipitation		Infiltration		Precipitation		Infiltration	
	mm/yr	Low (mm)	High (mm)	mm/yr	%/yr	Low (mm)	High (mm)	mm/yr	%/yr	Low (mm)	High (mm)	mm/yr	%/yr	Low (mm)	High (mm)	mm/yr	%/yr
MAP	270	276	323	0.11	0.04%	327	348	0.55	0.2%	327	348	2.72	0.8%	352	401	58.51	15.2%
1994	293	299	360	0.12	0.04%	365	393	0.61	0.2%	355	393	3.06	0.9%	398	462	64.88	15.5%
1995	372	369	430	0.15	0.04%	435	463	0.74	0.2%	435	463	3.62	0.8%	468	532	75.07	15.9%
1996	381	377	438	0.15	0.04%	443	471	0.75	0.2%	443	471	3.68	0.8%	476	540	76.19	15.8%
1991	358	357	418	0.14	0.04%	423	451	0.72	0.2%	423	451	3.52	0.8%	456	520	73.33	16.0%
1998	267	276	337	0.11	0.04%	342	370	0.57	0.2%	342	370	2.87	0.9%	375	439	61.54	16.7%

Notes:

1. Corrected precipitation for Low and High for the lower and upper elevations of the interval indicated.
2. Infiltration is the average value calculated at 50m intervals on the interval indicated.
3. In Aberdeen natural infiltration estimated to be 0.55 mm/yr (0.5% of MAP)

Table 12. Summary of Focused Recharge Estimates in the Project Area Based on the Chloride Mass Balance Method

Location	Monitoring Well ID	Ground Elevation (m asl)	Screened/Monitored Hydrostratigraphy	Completed Aquifer	Number of Samples Collected	Number of Data Points Used in Calculation	Estimated Recharge			Notes
							Average (mm/yr)	Max (mm/yr)	Min (mm/yr)	
Proposed Ajax Pit Area	AJGW01-D	902	Glacial Till	No Mapped Aquifer	6	6	0.8	1.0	0.7	-
	AJGW02-D	900	Nicola Group	No Mapped Aquifer	2	2	14.0	16.1	11.9	-
	AJGW02-S	900	Glacial Till	No Mapped Aquifer	4	4	1.1	3.5	0.3	-
	AJGW03-D	895	Fluvial / Glaciofluvial	No Mapped Aquifer	25	25	4.5	5.6	3.6	-
	AJGW04-D	886	Glacial Till	Sugarloaf Aquifer	4	4	0.9	1.0	0.7	-
	AJGW05-S	900	Fluvial / Glaciofluvial	No Mapped Aquifer	6	5	1.4	2.0	0.9	1 non-detect sample omitted from calculation
	AJGW06-D	904	Iron Mask Hybrid	Sugarloaf Aquifer	21	19	19.2	32.3	9.8	2 non-detect samples omitted from calculation; Connection to surface to well screen suspected based on hydrograph
	AJGW07-D	902	Nicola Group	No Mapped Aquifer	22	20	9.1	16.1	2.9	2 non-detect samples omitted from calculation
	AJGW07-S	902	Fluvial / Glaciofluvial	No Mapped Aquifer	23	20	9.7	16.1	2.8	3 non-detect samples omitted from calculation
	BGC10-PW01	905	Bedrock	No Mapped Aquifer	2	2	0.9	1.1	0.6	-
	LE-01	918	Mine Rock	No Mapped Aquifer	8	8	2.2	2.4	2.0	-
	LE-02	918	Mine Rock	No Mapped Aquifer	8	8	2.5	2.7	2.1	-
	LE-04	896	Mine Rock	No Mapped Aquifer	8	8	3.1	7.2	1.4	-
Open Pit Area/Jacko Lake	KAX-14-107S	896	Lacustrine	No Mapped Aquifer	3	3	4.9	4.9	4.9	-
	KAX-14-108S	901	Glacial Till	No Mapped Aquifer	3	3	1.9	2.2	1.7	-
	KAX-14-114S	896	Glacial Till or Fluvial / Glaciofluvial	No Mapped Aquifer	4	4	2.4	2.7	2.0	-
	KAX-14-128D	904	Nicola Group	No Mapped Aquifer	1	1	3.1	3.1	3.1	-
Proposed East Mine Rock Storage Facility (EMRSF)	MW11-04S	899	Iron Mask Hybrid	Sugarloaf Aquifer	12	12	1.8	1.9	1.4	-
	MW11-05D	977	Iron Mask Hybrid	Sugarloaf Aquifer	12	12	6.0	16.1	1.5	-
	MW11-05S	977	Iron Mask Hybrid	Sugarloaf Aquifer	12	12	3.2	5.1	1.5	-
	MW11-06D	943	Iron Mask Hybrid	Sugarloaf Aquifer	12	12	3.5	4.4	2.4	-
	MW11-06S	943	Fluvial / Glaciofluvial	No Mapped Aquifer	13	13	1.3	1.4	1.1	-
	MW11-07D	914	Iron Mask Hybrid	Sugarloaf Aquifer	13	13	2.4	2.7	1.9	-
	MW11-07S	913	Iron Mask Hybrid	Sugarloaf Aquifer	13	13	4.7	16.1	3.1	-
	MW11-10D	882	Fluvial / Glaciofluvial	Peterson Creek Aquifer	16	12	7.7	8.1	4.0	4 non-detect samples omitted from calculation
	BGC14-005	877	Iron Mask Hybrid	Sugarloaf Aquifer	5	5	6.3	8.1	3.1	-
	BGC14-006D	940	Iron Mask Hybrid	Sugarloaf Aquifer	4	4	4.8	8.1	3.4	-
Proposed South Mine Rock Storage Facility (SMRSF)	BGC14-009	901	Iron Mask Hybrid	No Mapped Aquifer	5	5	5.3	6.5	3.6	-
	BGC14-013	984	Nicola Group	No Mapped Aquifer	5	5	8.1	8.6	7.6	-
	BGC14-014D	984	Nicola Group	No Mapped Aquifer	3	3	6.1	8.1	2.2	-
	BGC14-015D	976	Nicola Group	No Mapped Aquifer	4	4	14.9	15.5	14.2	-
Proposed Tailings Storage Facility (TSF)	MW11-01S	943	Glacial Till	No Mapped Aquifer	16	13	16.8	40.3	2.1	3 non-detect samples omitted from calculation; Wide range in Cl values for only 2 samples
	MW11-02	855	Nicola Group	No Mapped Aquifer	14	13	2.4	2.7	1.6	1 non-detect sample omitted from calculation
	MW11-09D	905	Nicola Group	No Mapped Aquifer	12	12	2.1	3.0	1.0	-
	MW11-09S	905	Nicola Group	No Mapped Aquifer	12	12	1.9	2.1	1.1	-
	BGC14-001D	934.41	Nicola Group	No Mapped Aquifer	5	5	16.1	16.1	16.1	-
	BGC14-002D	923.19	Nicola Group	No Mapped Aquifer	5	5	6.7	7.5	5.7	-
	BGC14-002S	923.19	Glacial Till	No Mapped Aquifer	5	5	5.2	5.9	4.4	-
	BGC14-003D	895.9	Nicola Group	No Mapped Aquifer	3	3	4.5	4.8	4.3	-
	BGC14-003I	895.9	Fluvial / Glaciofluvial	No Mapped Aquifer	5	5	15.3	16.1	13.4	-
	BGC14-003S	895.9	Glacial Till	No Mapped Aquifer	5	5	11.7	16.1	8.2	-
	BGC14-010	978.4	Nicola Group	No Mapped Aquifer	5	5	4.8	5.2	4.2	-
	BGC14-011D	1027.15	Nicola Group	No Mapped Aquifer	5	5	2.1	2.2	2.0	-
	BGC14-011S	1027.15	Nicola Group	No Mapped Aquifer	5	5	3.3	3.4	3.0	-
	BGC14-012D	923.77	Nicola Group	No Mapped Aquifer	5	5	7.1	8.1	3.4	-
	BGC14-012S	923.77	Colluvium	No Mapped Aquifer	5	5	5.7	16.1	2.5	-
	BGC14-015S	976.46	Glacial Till	No Mapped Aquifer	4	4	20.8	32.3	14.9	-
	BGC14-016	1038.2	Nicola Group	No Mapped Aquifer	5	5	16.1	16.1	16.1	-
	BGC14-017D	1038.48	Nicola Group	No Mapped Aquifer	3	3	7.9	9.9	4.7	-
	BGC14-017S	1038.48	Glacial Till	No Mapped Aquifer	4	4	41.2	50.4	32.3	-
Jacko Lake South	MW11-08D	910	Nicola Group	No Mapped Aquifer	13	13	3.9	5.0	2.7	-
Jacko Lake North	MW11-04D	899	Iron Mask Hybrid	Sugarloaf Aquifer	4	4	1.6	1.9	1.5	-

Table 13. Estimated Baseflows based on Observed Low Flows at Stream Gauging Stations in the RSA and LSA

Regional Gauging Stations	Estimated Range in Baseflows				Watershed Area (km^2)
	(m^3/s)		(mm/yr)		
	Minimum	Maximum	Minimum	Maximum	
Salmon River Above Salmon Lake (08LE075)	0.2	0.8	44.1	176.5	143
Criss Creek Near Savona (08LF007)	0.4	1.7	26.4	112.0	479
Deadman River at Criss Creek (08LF027)	0.6	2.3	21.6	82.7	878
Guichon Creek at Outlet of Mamit Lake (08LG041)	0.2	1.2	7.2	43.5	871
Nicola River above Nicola Lake (08LG049)	0.7	4.9	14.7	103.1	1,500
Guichon Creek above Tunkwa Lake Diversion (08LG056)	0	0.2	0.0	80.7	78.2
Cherry Creek below Pendleton Creek (08LF086)	0.025	0.216	6.4	55.4	123

Local Gauging Stations	Estimated Range in Baseflows				Watershed Area (km^2)
	(m^3/s)		(mm/yr)		
	Minimum	Maximum	Minimum	Maximum	
JACINF	0.002	0.027	2.0	27.5	31
JACLAKE	0	0.062	0.0	47.7	41
JACSEEP	0	0.231	0.0	177.8	41
PETER	0	0.286	0.0	150.4	60
KEYNES	0	0	0.0	0.0	11

Notes:

1. Baseflows estimated based on ranges in observed flows during annual low flow period (i.e., July through November).
2. Regional gauging stations are all located outside the project RSA with the exception of Cherry Creek below Pendleton Creek (08LF086).

Table 14. Long Term Potential Evapotranspiration Estimated by KP (2014a)

Dataset		Evapotranspiration (mm)												
	Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Long-Term Synthetic	**-**	**0**	**1**	**12**	**40**	**77**	**103**	**130**	**114**	**71**	**28**	**3**	**0**	**579**
AJAXMET Station	2010	-	-	-	-	-	101	131	108	62	37	0	0	-
	2011	0	0	6	22	64	94	110	115	85	29	0	0	525
	2012	0	0	6	39	72	88	133	122	80	28	2	0	570
	2013	0	0	12	33	82	99	137	119	78	24	0	0	584
	2014	0	0	0	36	76	100	142	120	72	41	-	-	-
	Long-term est.	**0**	**0**	**6**	**33**	**73**	**96**	**131**	**117**	**75**	**32**	**0**	**0**	**560**

Table 15. Estimated Groundwater Extraction for Domestic Purposes from Aquifers Mapped within the RSA

Name	Aquifer No.	Materials	Description	No. of Wells used for Domestic Purposes	Estimated Groundwater Extraction	
					Canada (m^3/day)	Kamloops (m^3/day)
273 IIIB (10)	0273	Bedrock	Rose Hill / Barnhartvale / Shumway Lake	37	31.7	74.0
275 IIC (7)	0275	Bedrock	Knutsford	10	8.6	20.0
276 IIIB (10)	0276	Bedrock	Sugarloaf Hill southwest of Kamloops	6	5.1	12.0
277 IIB (9)	0277	Sand and Gravel	Davidson Creek	8	6.9	16.0
278 IIIA (9)	0278	Sand and Gravel	Peterson Creek	6	5.1	12.0
280 IIC (8)	0280	Sand and Gravel	2 km west of Barnhartvale	1	0.9	2.0
283 IIIB (11)	0283	Sand and Gravel	North Thompson River north of Kamloops	2	1.7	4.0
284 IIA (11)	0284	Sand and Gravel	Pulmill southwest of Kamloops	3	NA	6.0
285 IIB (10)	0285	Sand and Gravel	Campbell Creek	7	6.0	14.0
286 IIB (13)	0286	Sand and Gravel	Lower South Thompson River	2	NA	4.0
727 IIB (12)	0727	Bedrock	Cherry Cr valley; SW of Kamloops	63	54.0	126.0
728 IB (14)	0728	Sand and Gravel	Cherry Cr valley; SW of Kamloops	37	31.7	74.0
274 IIIB (9)	0274	Bedrock	Brigade Lake	8	6.9	16.0

Notes:

1. Pumping rate estimates are for domestic wells only.
2. Pumping rate estimates are based on a pumping rate of 2.0 m^3/day per well (Kamloops) or 0.86 m^3/day per well (Canada) for domestic wells only. Please see text for details.
3. Pumping rates for wells of 'unknown' type were assumed to be negligible.

APPENDIX A
JACKO LAKE HYDROGEOLOGICAL ASSESSMENT
KLOHN CRIPPEN BERGER (2015)

Klohn Crippen Berger

KGHM International

Ajax Mine

Jacko Lake Hydrogeological Assessment

CANADA'S BEST MANAGED COMPANIES Platinum member

ISO 9001
ISO 14001
OHSAS 18001

M09871A01.730

August 2015

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Appendix I – Jacko Lake Hydrogeology Assessment: Site Investigation Report

Appendix II – Non-Drilling SI data

1 INTRODUCTION

Klohn Crippen Berger Ltd. (KCB) was retained by KGHM Ajax Mining Inc. (KAM) to undertake a hydrogeological assessment in the vicinity of Jacko Lake for the Ajax Copper Gold Project, near Kamloops BC. This assessment will support the hydrogeology section of KAM's provincial Environmental Assessment (EA) Application and Federal Environmental Impact Statement (EIS). The Application and EIS will be collectively referred to as Application/EIS in this report.

Development of the mine will include expansion of the existing open pits, which are located immediately east of Jacko Lake. An understanding of the hydrogeology in the vicinity of Jacko Lake is required to assess the potential hydraulic connection, and evaluate whether open pit mining will potentially affect the lake.

This report summarizes the activities and results of the Jacko Lake hydrogeological assessment including the site investigation program and hydrogeological modelling predictions.

1.1 Background

Hydrogeological assessments and monitoring programs have been undertaken at the Ajax property since 1988. These assessments include the following key observations:

- Resistivity surveys immediately east of the lake indicated the overburden has a relatively low resistivity. When combined with drilling data acquired in the 1988 Hydrogeology Study (KL, 1988), the till was identified to be of low permeability and comprised of a very dense mixture of clay to gravel size material, with some cobbles. The glacial till was described as comprising some localised lenses of silt, sand, and gravels, however, the silty, sand and gravel units are discontinuous and confined by low permeability till.
- Test pitting in the northeast arm of Jacko Lake (prior to the lake level being raised) encountered approximately 4m thickness of moderately plastic clayey silt lake bed sediments overlying till. These units are inferred to combine to result in the formation of a low hydraulic conductivity barrier beneath the entire lake.
- Recharge boundary effects from Jacko Lake were not observed during a constant rate pumping test from a bedrock prototype dewatering well 100 meters from the shore of the lake. Seepage from the lake would have expected to result in indications of a constant-head or leaky boundary condition in the well response, which was not observed.
- Site Investigations on the eastern side of Jacko Lake indicate low hydraulic conductivity within the overburden and bedrock (KCB, 2015a).
- Geotechnical and exploration drilling, and mapping in the existing west pit, encountered low permeability bedrock, with no obvious aquifers. Groundwater occurrence is controlled by infrequent low permeability fractures which allows for seepage movement through the bedrock.
- No documented changes in Jacko Lake levels or groundwater levels attributable to mining activities were observed during previous open pit mining activities at the Ajax site.

1.2 Study Objectives and Scope of Work

The overall objectives of this study were to characterize the local hydrogeology in the vicinity of Jacko Lake, evaluate the mechanisms and pathways for potential hydraulic connectivity between Jacko Lake and the current and proposed pits, and to quantify the rate and fate of seepage from Jacko Lake to the proposed pit.

To achieve the project objectives, KCB developed a scope of work comprising three main tasks:

- develop a conceptual hydrogeological model for the Project area;
- design and implement a site investigation program to address the data gaps identified in the conceptual hydrogeological model; and
- complete predictive groundwater modelling for the Project area (Jacko Lake, proposed Ajax pit and immediate environs) to quantify the rate and fate of seepage from Jacko Lake to the proposed pit based on the conceptual hydrogeological model and site investigation results.

1.2.1 Conceptual Hydrogeological Model

The conceptual hydrogeological model presented in KCB (2013) addressed the following:

- delineation and characterization of the geological and hydrostratigraphic units;
- evaluation of the structural geological environment and local-scale structural features that may affect hydraulic connectivity between Jacko Lake, the existing West Pits and the proposed pit;
- spatial, lithological, and structural variability of hydraulic conductivity;
- assessment of recharge mechanisms and estimation of recharge rates;
- interpreted piezometric and potentiometric groundwater surfaces and inferred groundwater flow directions;
- evaluation of potential groundwater – surface water interaction; and
- groundwater and surface water quality.

This conceptual hydrogeologic model focused on Jacko Lake and the proposed pit and immediate environs. A regional hydrogeological assessment completed by BGC (2015) assessed the potential impacts from the entire Project (i.e. all mine infrastructure) on groundwater levels and flows. The preliminary (pre-site investigation) conceptual hydrogeological model was issued to KAM on October 28, 2013 (KCB, 2013). A revised conceptual model based on the site investigation program completed as part of this assessment is presented in Section 4.

1.2.2 Site Investigation Program

KCB completed a data gaps assessment as part of the development of the conceptual hydrogeological model which led to the design and implementation of a site investigation program carried out in 2014 (KCB, 2015a).

In addition to improving the overall understanding of the distribution and hydrogeological characteristics of the overburden and bedrock units, the site investigation program was developed to address the following gaps:

- Characterize the hydraulic conductivity of:
  - inferred faults and fracture networks;
  - potential “void” structures;
  - geological unit contacts; and
  - the underlying picrite bedrock.
- Assess the thickness and properties of the lake bed sediments including the glacial sediments below the lake bottom and above the bedrock.

As requested by the Stk’emlupsemc te Secwepemc Nation (SSN), no mechanized or “invasive” investigations were performed within or under the wetted perimeter of Jacko Lake. Instead a geophysical survey was performed within the lake and supplemented by hand auger holes and angled drill holes at the lake edge to improve understanding of the hydrogeology characteristics of Jacko Lake.

The site investigation activities were completed in two phases: drilling and non-drilling, discussed in Sections 2 and 3. The drilling and testing site investigation report is provided in Appendix I. Site Investigation activity locations are shown on Figure 2.

1.2.3 Groundwater Modelling

Groundwater modelling was conducted to assist with quantification of seepage from Jacko Lake towards the current and proposed pit extents through mine life. Groundwater modelling consisted of two stages: SEEP/w 2D (KCB, 2014b and KCB, 2015b) and MODFLOW 3D.

SEEP/w 2D modelling was completed to support:

- slope design;
- the groundwater flow groundwater flow modelling;
- KAMpit slope depressurization assessments; and
- Jacko Lake dam design assessments.

MODFLOW 3D modelling was completed to simulate:

- current (base case) conditions - calibration;
- transient predictive scenarios over the life of mine; and
- conceptual mitigation options to reduce seepage from Jacko Lake to the pit, if required.

2 SITE INVESTIGATION – DRILLING AND TESTING PROGRAM

The drilling and testing program was designed to improve the overall understanding of the distribution and hydrogeological characteristics of the overburden and bedrock, address uncertainties with regard to the hydraulic conductivity of inferred structural and lithological features (fractures, faults, potential void structures, lithological unit contacts, etc.), and to characterize the picrite unit, which had not been rigorously assessed in previous investigations.

The drilling and testing program was comprised of the following:

- inspection of representative drill core from previous investigations;
- advancement of 11 drill holes at 5 drill sites:
  - 4 vertical drill holes terminated in overburden;
  - 4 vertical drill holes terminated in bedrock; and
  - 3 inclined drill holes terminated in bedrock.
- geotechnical and geological logging of drill returns (core and cuttings);
- Standard Penetration Testing (SPT) at 1.5 m intervals in the overburden at each drill site;
- air lift yield tests in the overburden and bedrock at each drill site;
- single and straddle packer testing in the bedrock in each drill hole;
- installation of instrumentation (standpipe piezometers or vibrating wire piezometers);
- well development; and
- groundwater level monitoring.

The design, implementation, and results of the drilling and testing investigation is detailed in KCB, 2015a (Appendix I), and summarized below.

2.1 Drilling Program

All drilling returns were logged geotechnically and geologically by KCB personnel, with confirmatory geological logging performed by KAM following completion of the drilling program. Logging was generally undertaken while core was in the splits to minimize mechanical damage. The following logging and sampling activities were undertaken during the drilling program:

- Soil description including USCS classification, gradation, plasticity, consistency/density, moisture content, colour, structure, foreign materials, and geological interpretation.
- Rock description including Total Core Recovery (TCR), Rock Quality Designation (RQD), Solid Core Recovery (SCR), rock type, grain size, weathering, hardness, structure, fracture frequency (# of fractures per 30 cm), fracture and structure orientation, and discontinuity descriptions.

Photographs were taken of drilling returns and samples were collected for laboratory analysis, as required. Rock core was placed in core boxes for KAM for further geological logging, assays, etc., and for long term storage.

A Reflex Act II tool was used to confirm the inclination of the drill holes during bedrock drilling to determine the deviation of the drill holes under Jacko Lake, and to orient the core returns. Where drill core was unable to be oriented (e.g. due to highly broken intervals or equipment issues), angle measurements were not recorded.

Drill hole details are summarized in Table 2.1 and orientation details for inclined drill holes are provided in Table 2.2; drill hole logs are provided in the Site Investigation report (Appendix I), including downhole rock mass characteristic plots.

Table 2.1 Drill Hole Details

Drill hole ID		Easting/ Northing	Drill hole Diameter (mm)	Date Completed	Drilled Length (m)	Depth to Bedrock	Testing[1]	Well Installation Details			
KAM ID	Original ID							Instrument	Stick-up (mags)[2]	Screen Interval (mbgs)[3]	Geology of Screen Zone
KAX-14-107S	KCB13-05	683224/ 5609202	122.6	April 16, 2014	38.5	38.8	SPT, ALY, PT	50.8 mm Sched. 80 PVC MW	0.44	29.9 – 38	Glacial Till
KAX-14-107D				March 10, 2014	128.0			50.8 mm Sched. 80 PVC MW	1.04	56.7 – 75	Bedrock
KAX-14-108S	KCB13-03	683140/ 5609428	122.6	April 4, 2014	36.0	37.6	SPT, ALY, PT	50.8 mm Sched. 80 PVC MW	0.72	31.4 – 36	Glacial Till
KAX-14-108D				March 22, 2014	148.4			50.8 mm Sched. 80 PVC MW	0.63	91.8 – 111.8	Bedrock
KAX-14-114S	KCB13-04B	683210/ 5609277	122.6	April 11, 2014	33.0	37.57	SPT, ALY, PT	50.8 mm Sched. 80 PVC MW	0.86	19.8 – 32.9	Glacial Till
KAX-14-114D			96.0	April 3, 2014	124.0			50.8 mm Sched. 80 PVC MW	0.86	98.3 - 124	Bedrock
KAX-14-121	KCB13-01	683236/ 5609655	96.0	April 12, 2014	150.9	9.58 (10.2 along drill hole)	ALY, PT	50.8 mm Sched. 80 PVC (pre-pack screen) MW	0.00	141.9 – 150.9	Glacial Till
KAX-14-124 A/B	KCB13-02A	683316/ 5609491	96.0	April 24, 2014	250.0	20.67 (22 along drill hole)	ALY, PT	VWP x2	0.00	A: 50.4 B: 190.4	Bedrock
KAX-14-128S	KCB13-02B	683325/ 5609497	122.6	April 30, 2014	18.0	17.8	SPT, ALY, PT	50.8 mm Sched. 80 PVC MW	0.53	9.7 - 18	Glacial Till
KAX-14-128D			96.0	April 24, 2014	198.8			50.8 mm Sched. 80 PVC MW	0.05	70.1 - – 90.5	Bedrock
KAX-14-130 A/B	KCB13-04A	683214/ 5609281	96.0	May 7, 2014	225.0	31.95 (34 along drill hole)	ALY, PT	VWP x2	0.00	A: 175.3 B: 222.3	Bedrock Bedrock

[1]SPT: Standard Penetration Test, ALY: Air Lift Yield Test, PT: Packer Test, MW: monitoring well.
[2]mags: metres above ground surface. Stick-up measurements as recorded prior to KCB demobilization; final stick-up heights may change as well installations and monument casing are completed by Geotech.
[3]mbgs: metres below ground surface; tip depth provided for VWP installations (metres along borehole).

Table 2.2 Drill Hole Orientation Measurements

KAM Hole ID	Station Depth (m)[1]	Inclination (°)	Azimuth (°)[2]
KAX-14-121[3]	10	-68.7	199.5
	109	-69.7	199.5
KAX-14-124[4]	136	-69.8	293.6
	196	-70.0	295.1
KAX-14-130[5]	50	-70.2	289.4
	96	-70.4	287.5
	151	-71.3	287.9
	218.5	-71.9	285.3
	226	-72.3	285.0

[1]Station depth is the terminal depth of the measurement (i.e., station depth of 10 m provides the inclination and azimuth over the interval 0 – 10 m).
[2]Azimuth not corrected for magnetic declination; field checked with compass.
[3]KAX-14-121 was targeted as -70° inclination and 200° Azimuth.
[4]KAX-14-124 was targeted as -70° inclination and 295° Azimuth.
[5]KAX-14-130 was targeted as -70° inclination and 290° Azimuth.

2.2 Testing Program

The testing program undertaken during drilling consisted of three components:

- Standard Penetration Tests (SPT) conducted in accordance with ASTM D1586-11 at 1.5 m intervals through the overburden in vertical drill holes to gather samples (split spoon) and provide an indication of soil density with depth.
- Air Lift Yield Testing (ALY) conducted in overburden and bedrock intervals to provide qualitative indications of groundwater inflow with depth.
- Packer Testing (PT) in bedrock to estimate hydraulic conductivity in intervals of interest.

SPT measurements are provided in the drill hole logs (KCB, 2015a; Appendix I). The ALY and PT methods and result are provided in Sections 2.2.1 and 2.2.2, respectively.

Upon completion of drilling and well installation and development, slug testing was undertaken by KAM and their designates to estimate hydraulic conductivity of screened intervals in select wells. Slug test results are discussed in Section 2.2.3.

2.2.1 Air Lift Yields

ALY tests were conducted in open drill holes prior to well installation to provide qualitative indications of groundwater inflow. Water in the open drill hole was evacuated using the rig air compressor and the discharge rate was monitored using a “bucket and stopwatch” until the yield stabilized.

The results of the ALY tests were used to select zones for packer testing, primarily concentrated at zones of relatively high yield. The results of the ALY tests are presented in Table 2.3.

Table 2.3 Summary of Air Lift Yield Tests

KAM Hole ID	Date	Duration (min)	Hole Depth (at time of testing) (m)	Bit Depth (m)	Casing Depth (m)	Pressure (psi)	Estimated Yield (L/s)	Lithology of tested Zone
KAX-14-107	4-Mar-14	17	33.5	33.0	25.9	50	1.4	Glacial Till
KAX-14-107	5-Mar-14	42	39.8	39.4	35.1	80	0.01	
KAX-14-107	5-Mar-14	22	39.8	39.1	35.1	100	0.03	
KAX-14-107	5-Mar-14	31	39.8	38.0	35.1	100	0.1	
KAX-14-107	6-Mar-14	21	45.9	41.0	39.6	100	0.03	Bedrock
KAX-14-107	7-Mar-14	16	65.0	54.5	39.6	90	0.01	
KAX-14-107	9-Mar-14	21	84.5	68.0	39.6	120	0.02	
KAX-14-108	13-Mar-14	15	17.0	16.8	13.5	60	0.04	Glacial till
KAX-14-108	14-Mar-14	28	21.5	18.3	18.3	-	0.05	
KAX-14-108	14-Mar-14	24	26.0	25.5	19.5	70	0.2	
KAX-14-108	15-Mar-14	22	30.5	30.5	24.0	50	0.2	
KAX-14-108	15-Mar-14	33	39.5	38.9	24.0	90	0.08	Bedrock
KAX-14-108	16-Mar-14	20	44.0	39.5	34.3	60	0.2	
KAX-14-108	17-Mar-14	20	57.5	45.5	34.5	55	0.1	
KAX-14-108	17-Mar-14	30	72.5	59.0	34.5	120	0.1	
KAX-14-108	18-Mar-14	24	78.5	68.0	34.5	80	0.02	
KAX-14-108	19-Mar-14	28	93.5	82.3	34.5	85	0.1	
KAX-14-108	19-Mar-14	15	114.5	104.0	34.5	120	0.1	
KAX-14-108	21-Mar-14	21	128.0	120.5	34.5	140	0.06	
KAX-14-108	22-Mar-14	25	148.4	131.0	34.5	135	0.05	
KAX-14-114	29-Mar-14	15	22.6	21.8	21.8	70	0.01	Glacial Till
KAX-14-114	29-Mar-14	16	31.7	25.6	25.6	47	0.5	
KAX-14-114	30-Mar-14	15	37.6	31.6	31.6	47	0.7	Bedrock
KAX-14-114	30-Mar-14	19	37.6	33.2	33.2	50	0.7	
KAX-14-114	31-Mar-14	22	74.0	66.5	38.0	50	0.4	
KAX-14-114	2-Apr-14	21	110.0	84.5	38.0	50	0.4	
KAX-14-121	8-Apr-14	34	27.9	13.2	8.8	60	0.03	Bedrock
KAX-14-121	8-Apr-14	26	48.9	35.1	8.8	100	0.01	
KAX-14-121	9-Apr-14	30	72.9	64.0	8.8	-	0.05	
KAX-14-121	10-Apr-14	30	129.9	126.0	8.8	110	0.3	
KAX-14-121	10-Apr-14	20	129.9	98.5	8.8	110	0.02	
KAX-14-121	11-Apr-14	30	150.9	140.9	8.8	-	0.05	
KAX-14-124	15-Apr-14	27	35.5	32.5	21.7	83	0.1	Bedrock
KAX-14-124	16-Apr-14	15	43.0	32.5	21.7	83	0.08	
KAX-14-124	17-Apr-14	20	65.5	50.5	21.7	85	0.08	

KAM Hole ID	Date	Duration (min)	Hole Depth (at time of testing) (m)	Bit Depth (m)	Casing Depth (m)	Pressure (psi)	Estimated Yield (L/s)	Lithology of tested Zone
KAX-14-124	18-Apr-14	25	83.5	64.0	21.7	100	0.02	
KAX-14-124	18-Apr-14	20	103.0	85.0	21.7	55	0.5	
KAX-14-128	19-Apr-14	30	23.3	17.0	17.0	80	0.01	Bedrock
KAX-14-128	19-Apr-14	25	32.3	26.3	17.8	100	0.002	
KAX-14-128	20-Apr-14	30	45.8	32.3	17.8	50	0.04	
KAX-14-128	20-Apr-14	30	56.3	50.3	17.8	70	0.03	
KAX-14-128	21-Apr-14	35	81.8	63.8	17.8	80	0.2	
KAX-14-128	22-Apr-14	60	110.3	93.8	17.8	70	0.08	
KAX-14-128	23-Apr-14	30	129.8	110.3	17.8	85	0.2	
KAX-14-128	24-Apr-14	60	149.3	129.8	17.8	75	0.6	
KAX-14-128	25-Apr-14	60	153.8	129.8	17.8	110	0.3	
KAX-14-130	30-Apr-14	30	44.5	35.5	25.5	70	0.4	Bedrock
KAX-14-130	1-May-14	30	70.0	44.5	25.5	65	0.6	
KAX-14-130	1-May-14	60	83.5	70.0	25.5	80	0.0	
KAX-14-130	2-May-14	60	109.0	82.0	25.5	110	0.2	
KAX-14-130	3-May-14	30	137.5	109.0	25.5	120	0.2	
KAX-14-130	3-May-14	30	169.0	137.5	25.5	145	0.8	

Yields generally ranged from <0.01 L/s to <1 L/s, with the highest yield observed at the southernmost well (KAX-14-107; maximum 1.4 L/s at 33 m depth). The higher yield observed at KAX-14-107 is associated with a 2.5 metre thick Glacial Till silty gravelly zone and an interval with no sample recovery. The low yields from the ALY tests are indicative of measured low hydraulic conductivity overburden and bedrock materials. This supports previous observations on localised, discontinuous, and confined higher permeability silty sand and sandy gravel zones.

2.2.2 Packer Testing

Packer testing was undertaken in bedrock during and following drilling using a SWiPS hydraulic packer system. Open hole testing during drilling was completed using a single packer assembly, and a double packer assembly (straddle packer; maximum 10 m span) was used after completion of the drill hole to target key intervals. Holes were flushed with clean water for at least 10 minutes prior to packer testing to displace drilling fluids.

Packer intervals were selected to provide an estimate of the hydraulic conductivity of:

- each “bulk” lithological unit;
- zones with apparent low/high ALY inflows and permeability (based on drill hole logs); and
- lithological contacts.

The results of the packer testing are summarized in Table 2.4. Laminar flow was inferred for almost all of the packer tests.

Table 2.4 Summary of Packer Testing Results

KAM Hole ID	Test #	Interval (mbgs)	Simplified Lithology*	Estimated Hydraulic Conductivity; K (m/s)
KAX-14-107	107-PT2	90.3 – 128.0	NV; competent	3×10^{-10}
	107-ST1	101.5 – 108.5	NV; competent	8×10^{-9}
	107-ST3	68.0 – 74.0	PICR; broken/fractured	4×10^{-7}
	107-ST4	56.0 – 62.0	PICR, soft/massive to 60.5m; fracture zone 60.5 – 62m	2×10^{-7}
KAX-14-108	108-PT1	41.0 – 44.0	NV/PICR contact; Fault/shear zone	4×10^{-8}
	108-PT2	47.0 – 58.0	PICR/NV contact; fractured	3×10^{-7}
	108-PT4	67.5 – 78.5	PICR	7×10^{-9}
	108-PT5	83.5 – 93.5	PICR	4×10^{-9}
	108-PT6	98.8 – 114.5	PICR; some small fracture zones	2×10^{-8}
	108-PT7	132.3 – 148.4	PICR; some fracture zones	2×10^{-8}
	108-ST1	121.8 – 128.0	PICR; fracture/shear zone	3×10^{-8}
KAX-14-114	114-PT1	47.8 – 50.0	PICR; vuggy	2×10^{-7}
	114-PT2	67.3 – 74.0	PICR/NV contact; some fracture zones	2×10^{-8}
	114-PT4	85.8 – 110.0	PICR; many small fracture/shear zones	3×10^{-8}
	114-ST1	79.0 – 85.0	PICR; fault zone, highly altered PICR	1×10^{-9}
	114-ST2	52.0 – 59.5	PICR; highly altered, shear zones	1×10^{-7}
	114-ST3	41.0 – 47.0	PICR; competent	9×10^{-9}
KAX-14-121	121-PT2	14.5 – 27.9	PICR; fractured	2×10^{-7}
	121-PT3	36.4 – 48.9	PICR (fractured) 36.4 – 45.9m; SLD (competent) 45.9m – 48.9m	1×10^{-8}
	121-PT4	65.3 – 72.9	SLD	3×10^{-8}
	121-PT5	99.7 – 129.9	PICR (massive); NV	5×10^{-9}
	121-PT6	125.2 – 129.9	SLD; some fractured PICR	8×10^{-9}
	121-PT7	142.2 – 150.2	SLD/PICR/NV	2×10^{-8}
	121-PT8	110.3 – 150.9	NV/SLD/PICR	3×10^{-9}
	121-ST1	118.0 – 122.5	NV/SLD contact	1×10^{-7}
	121-ST2-2	105.0 – 114.0	NV; competent	6×10^{-9}
	121-ST3	46.0 – 48.0	SLD	5×10^{-9}
KAX-14-124	124-PT1	33.8 – 43.0	PICR; some broken zones	6×10^{-9}
	124-PT2	44.3 – 50.5	PICR; shear zones	2×10^{-7}
	124-PT3	57.8 – 65.5	PICR; potential void	8×10^{-9}
	124-PT4	71.3 – 83.5	PICR; faulted/sheared	9×10^{-8}
	124-PT5	63.8 – 83.5	PICR; potential void and faulted/sheared	1×10^{-7}
	124-PT6	86.3 – 103.0	PICR; fractured	3×10^{-7}

KAM Hole ID	Test #	Interval (mbgs)	Simplified Lithology*	Estimated Hydraulic Conductivity; K (m/s)
	124-PT7	116.3 – 136.0	PICR/NV; competent	3×10^{-9}
	124-PT8	137.3 – 166.0	PICR/NV/SLD; competent	9×10^{-10}
KAX-14-128	128-PT2	65.1 – 81.8	NV	2×10^{-7}
	128-PT3	95.1 – 110.3	PICR/NV; fractured	4×10^{-8}
	128-PT4	111.1 – 131.0	PICR/NV	4×10^{-10}
	128-PT5	156.1 – 174.8	SLD	7×10^{-9}
KAX-14-130	130-PT1	36.8 – 44.5	PICR to 41.5m; NV to 44.5m	5×10^{-9}
	130-PT2	65.1 – 81.8	Volcanic Breccia to 71.5m; PICR (friable in areas) to 78.5m; NV to 81.8m	4×10^{-8}
	130-PT3	71.3 – 83.5	PICR to 78.5m; NV to 83.5m	1×10^{-8}
	130-PT4	83.3 – 109.0	NV to 100 m; PICR to 101.2 m; NV to 109.0 m	1×10^{-9}
	130-PT5	110.3 – 137.5	NV	4×10^{-9}
	130-PT6	138.8 – 169.0	NV to 140.5 m; PICR to 142.0 m; NV to 169.0 m (incl. brecciated zone)	4×10^{-9}
	130-PT8	189.8 – 226.0	NV; fault zone	5×10^{-9}
	130-ST1	159.8 – 168.8	NV breccia	1×10^{-8}
	130-ST2	56.3 – 64.3	NV; incl. brecciated zone	3×10^{-8}

*: NV: Nicola Volcanics, PICR: Picrite; SLD: Sugarloaf Diorite

The results of the packer tests indicate generally low hydraulic conductivity bedrock, with relatively competent/unfractured intervals ranging from 10^{-8} m/s to 10^{-9} m/s and weaker/more fractured intervals generally around 10^{-7} m/s. There was a general correlation between hydraulic conductivity and air lift yield.

The packer tests completed within and around the potential void structure intersected at KAX-14-124 indicated that the void and the surrounding fractured zones had a higher hydraulic conductivity than the unfractured/competent bedrock around the void (10^{-7} m/s adjacent to the void, 10^{-9} m/s in the surrounding competent bedrock). However, the “take” (i.e., the volume of water penetrating into the interval) dropped off to effectively no flow near the end of the test, suggesting low permeability similar to the surrounding competent bedrock. This suggests that once the unsaturated void filled with water, there is appreciably less flow from the void to the surrounding bedrock (i.e., it is a confined porous zone in the rock).

The packer tests completed across the inferred fault structure encountered at KAX-14-130 indicated an apparent low hydraulic conductivity ranging from 10^{-9} m/s to 10^{-10} m/s, suggesting that the hydraulic conductivity of the fault is similar to the surrounding bedrock.

2.2.3 Slug Testing

Slug testing was conducted at KAX-14-114S and KAX-14-128S by BGC on behalf of KAM to estimate the hydraulic conductivity of the screened intervals.

The results of the slug tests are summarized in Table 2.5.

Table 2.5 Summary of Slug Test Results (after BGC, 2014)

Well Location	Aquifer Type	Test Type	Analysis Method	Estimated Hydraulic Conductivity; K (m/s)	Average Depth of Screened Interval (mbgs)	Simplified Lithology	Notes
KAX-14-114S	Unconfined	Falling Head	Hvorslev (1951)	1×10^{-6}	26.5	Silty sand and sandy gravel	-
		Rising Head		2×10^{-6}			
KAX-14-128S*		Falling Head		1×10^{-6}	14	Silty sand and sandy gravel	K estimated from early time data
		Rising Head					
		Falling Head		5×10^{-8}	14	Sand and silt	K estimated from late time data
		Rising Head					

*: KAX-14-128S is screened across two lithological units ; Groundwater response was subsequently interpreted for both early and late time to attempt to estimate the hydraulic conductivity of the two lithological units.
mbgs: meters below ground surface

3 SITE INVESTIGATION – NON-DRILLING PROGRAM

The non-drilling site investigation was conducted between August and November 2014 and comprised three components:

- Geophysical surveys (non-invasive) from a boat on the surface of Jacko Lake to provide detailed bathymetry and to assess the stratigraphy beneath the lake.
- Test pits, hand auger holes, and infiltration testing to characterize the shallow overburden materials in the immediate vicinity of Jacko Lake.
- A constant rate pumping test at BGC10-PW01 to reassess the results of the 2011 BGC pumping test with the expanded monitoring network installed by KCB in 2014.

3.1 Geophysical Survey

Frontier Geosciences Inc. (Frontier) completed a lake geophysical program to provide bathymetry for Jacko Lake and to estimate the thickness and distribution of submerged lake bed sediment and underlying till. The survey was conducted from September 4-6, 2014; the Frontier report is provided in Appendix II.

The bathymetry data were collected using high frequency sonar, and a full spectrum Compressed High Intensity Radiated Pulse (CHIRP) system was used in conjunction with a sub-bottom seismic electric pulser source system to infer lake bed sediment and till thicknesses.

The bathymetric survey had greater coverage due to the shallow water in the “arms” of Jacko Lake, which caused too many reverberations in the CHIRP data (i.e., the signal to noise ratio was too low to clearly delineate reflective surfaces). The maximum estimated depth was approximately 24 metres from water surface with a rapid drop-off away from the shorelines and away from the “arms”. The results of the bathymetric survey are shown on Figure 3 as elevations.

Five sub-bottom layers were identified with the CHIRP survey, with the fourth boundary interpreted as the sediment/till layer and the fifth interpreted as the till/bedrock contact. The interpreted lake bottom surface and the bedrock contact surface are similar, suggesting that the shape and profile of Jacko Lake is controlled predominantly by the shape of the bedrock surface rather than the till.

The total inferred lake bed sediment thickness typically ranges from 8 m to 12 m (Figure 4), and the inferred till thickness ranges from 2 m to 6 m (Figure 5) resulting in typically 10 m to 18 m of material above the bedrock contact. The minimum overall thickness of material above the bedrock contact is generally 4 m to 6 m. The estimated bedrock contact elevation is shown on Figure 6. Figure 23 shows depth to bedrock outside of the Jacko Lake area.

3.2 Test Pit and Hand Auger Program

The subsurface component of the non-drilling site investigation consisted of the excavation of six test pits and advancement of eight hand auger holes from August 19 to August 22, 2014 in the immediate vicinity of Jacko Lake.

Compliant with the approved Notice of Work application (NOW) submitted by KAM, the test pits and hand augers test holes were conducted as follows:

Test Pits:

- intended for geotechnical and hydrogeological characterization of overburden materials outside of the Jacko Lake footprint;
- limited to a maximum surface area disturbance of 2 m^2;
- maximum excavation depth of the shallower of 4 m or 0.5 m below the water table; and
- test pits backfilled with nominal compaction with excavator bucket upon completion of sampling.

Hand Auger Holes:

- intended to characterize shallow sediments outside of the current Jacko Lake boundary but within the area defined by the high water mark;
- maximum 1.5 m deep and approximately 10 cm in diameter;
- in-situ permeability testing in the hand auger holes using a Guelph Permeameter (Section 3.3); and
- hand augers holes backfilled by hand upon completion.

Test pit logs are provided in Appendix II. Two test pits were completed along the northern shore of the northeast arm of Jacko Lake, and four between the northeast and southeast arm outside of the current lake footprint (Figure 2; inset). The stratigraphy typically consisted of relatively thin organic soils underlain by fine grained glaciolacustrine/glacial till materials (silts and clays, up to 0.5 m thick) underlain by coarser grained glaciolacustrine/glacial till , underlain by bedrock. Finer grained layers tended to be dry to moist; however water was not observed to free flow from Jacko Lake to the test pit which supports the observations of low hydraulic conductivity and connectivity in the overburden. Some small discontinuous perched groundwater was observed in coarse grained lenses within thicker fine grained till layers.

Hand auger test holes were completed within the high water mark but outside the current water level of Jacko Lake and minimal ground preparation was required to advance the augers (i.e., no clearing was required). Hand auger hole depth ranged from 0.4 m to a maximum of 0.8 m due to refusal. The stratigraphy generally consisted of discontinuous thin organic soil layers underlain by discontinuous silt layers, underlain by an inferred continuous clay layer (extrapolated from

geophysical surveys and test pits). A silty gravel was encountered at the base of KCB14-HA1, but the thickness of that layer could not be assessed due to auger refusal (0.1 m thickness was logged prior to termination of the hole). The silt and clay layers are considered to reflect lake bed sediments deposited when the lake level was higher. Hand auger logs are provided in Appendix II.

3.3 Infiltration Testing

Twenty four infiltration tests including duplicate and aborted tests were conducted at nine locations using a Guelph Permeameter, either in the hand auger test holes or in shallow intervals offset from hand auger locations. Fourteen tests were completed successfully and considered reflective of in-situ permeability.

The estimated permeability values derived from the representative Guelph Permeameter testing ranged from 3×10^{-8} m/s to 1×10^{-7} m/s, with one test value at 1×10^{-6} m/s recorded at KCB14-HA1 in the basal gravel layer. The geometric mean of all test results across the stratigraphic units is 9×10^{-8} m/s indicating a relatively low permeability silt/clay lake sediment material.

The results of the representative Guelph Permeameter testing are provided in Appendix II.

3.4 Pumping Test

A constant rate pumping test was conducted by BGC Engineering Inc. (BGC) for Abacus Mining and Exploration Inc. (AME) at BGC10-PW01 as part of the feasibility level assessment undertaken in 2011 for the Ajax Mine Project. The test program consisted of a variable-rate test (step-test) to determine stable pumping yields and assess specific capacity of the well, followed by a constant-rate pumping test at approximately 0.5 L/s for eight days followed by recovery monitoring. Testing was undertaken to evaluate groundwater drawdown response in the vicinity of Jacko Lake and the then-proposed pit extent, and to support an assessment of whether dewatering using perimeter wells may be a feasible option for pit depressurization.

The results of the pumping test program suggest the bedrock is heterogeneous, with barrier boundary effects indicative of limited recharge and discontinuously fractured. Analyses of the recovery response suggested that Jacko Lake did not contribute recharge to the well during pumping. The results of the 2011 constant rate test were interpreted using unconfined analytical solutions, which do not align with the conceptual model; BGC recommended further analysis using more sophisticated and alternate analytical solutions. KCB recommended that the constant rate portion of the test undertaken by BGC be repeated to include the collection of data from the new monitoring instrumentation installed during the 2014 site investigation program (monitoring wells and vibrating wire piezometers).

This test was intended to reassess the drawdown response and heterogeneity based on a more extensive monitoring network, which includes instrumentation across faults and close to Jacko Lake.

This test was designed to assist in assessing connectivity between Jacko Lake and the proposed pit by:

- monitoring instrument response in the expanded well network; and
- improving estimates of hydraulic parameters and assessing heterogeneity.

The test configuration details and analytical methods are presented in Appendix II. The results of the constant rate test were interpreted using a variety of analytical solutions intended to address the response data, including consideration for:

- single well response (i.e., pumping well only);
- multi-well analysis (pumping well and observation wells, which can allow for improved estimates of storage parameters);
- unconfined behavior;
- confined behavior;
- well bore storage;
- curve matching for early and late time; and
- recovery response.

Bedrock

During the pumping tests, appreciable drawdown was observed in one bedrock monitoring well located 52 m from the pumping well. Results from the BGC10-PW01–KAX-14-128D well pair suggest a transmissivity of 3.4 x 10^{-6} m^2/sec (which converts to a hydraulic conductivity of 3.4 x 10^{-8} m/s based on an assumed saturated thickness of 100 m). A storativity value (S) in the range of 0.002-0.006 was determined, suggestive of confined conditions (Kruseman and de Ridder, 1994). These results are consistent with the single-well (pumping test) results.

Shallow Groundwater (overburden)

Measureable drawdown was observed in 3 of the 7 wells screened in the groundwater stored within glacial till (<20m depth) that were monitored during the test. One of these wells (AJGW01) yielded data that resulted in a reasonable match to the Neuman-Witherspoon solution confined by a low permeability unit. Results suggest a transmissivity value of 3.4 x 10^{-6} m^2/sec. Storativity values could not be determined accurately. Results also suggest that the glacial till has higher permeability than the bedrock by approximately 1-2 orders of magnitude, consistent with the estimates derived from infiltration testing, slug testing, and historical assessments of overburden materials in the vicinity of Jacko Lake.

The pumping test results do not indicate any evidence of a hydraulic connection between Jacko Lake and the pumping well.

4 REVISED CONCEPTUAL HYDROGEOLOGICAL MODEL

4.1 Regional Setting

The Project site is located to the southwest of the city of Kamloops, British Columbia, in an area of moderate topographic relief (Figure 1 and Figure 2). Surface elevation across the Project site ranges from approximately El. 800 m to 1,100 m, with the regional topography ranging from El. 300 m to 1,900 m. The Project area is characterized by grasslands with a gentle slope to the north towards the Thompson River (at approximate elevation El. 370). Regional glaciation across the Project area has resulted in the development of the rolling hills and glacial deposits aligned northwest-southeast, parallel to the direction of glacial movement.

The climate across the project area has been characterized as semi-arid steppe, typified by low annual precipitation and high evaporation (KP, 2009). Further details regarding the Project site precipitation and evapotranspiration are provided in Section 4.2.

Jacko Lake, West Pit and the proposed final pit are located within the base of an east-west trending, relatively flat-based valley (approximately El. 900 m) within the Peterson Creek Watershed. Localized drainage has been substantially modified. Peterson Creek outflows from Jacko Lake through a culvert under an earthfill dam, which has been raised / modified several times since construction in the 1940s.

4.2 Precipitation & Evapotranspiration

Precipitation across the Project area is seasonally variable. Periods of highest precipitation are typically recorded during June and July, with snowfall dominating the precipitation in the winter months (KP, 2009). Historical data have been collected and reviewed for the Afton BC Fire Service (BCFS) station (El. 780 m) and the Kamloops-Afton Mines climate station (approximately El. 670 m) in the vicinity of the New Afton project. These records indicate a 25% snow to 75% rain precipitation distribution, with equivalent snow water rates calculated for snowfall. Mean annual precipitation values range from 223 mm at Afton BCFS to 305 mm at Kamloops-Afton Station. Higher precipitation rates have generally been recorded at regional climate stations at higher elevations (e.g. 397 mm/year at Kamloops Pratt Road station at El. 852 m). Orographic effects are not apparent between the mean precipitation records for the Afton BCFS and Kamloops-Afton station, likely due to differences in the length of the data records.

The geospatial mean annual precipitation is estimated at a rate of 375 to 400 mm/year in the vicinity of Jacko Lake and the proposed pit expansion. This is comparable to the regional geospatial mean annual precipitation values for the area (BC Ministry of Forests and Range; publically available dataset) from climate stations proximal to the site. Previous precipitation studies within the vicinity of the project site used the geospatial mean annual precipitation values to assist in numerical model development. However, the geospatial mean annual data were processed to remove elevation dependence and, as such, have not considered orographic effects.

Thornthwaite calculations were performed to estimate monthly potential evapotranspiration rates based on monthly average temperatures at the Afton BCFS station and latitude. Estimated evapotranspiration rates were calculated to be highest during the warmer months (May to September), with negligible evapotranspiration from December through February. The maximum calculated potential evapotranspiration rate was 139 mm/year in July. Regional (measured) evapotranspiration estimates from the Highland Valley climate station (located approximately 43 km to the southwest of Jacko Lake; El. 1470 m) were adjusted to account for elevation differences and compared to the Afton BCFS values. The adjusted values from the Highland Valley climate station range from negligible in October through April, to a maximum of 145 mm/year in June. The estimated annual potential evapotranspiration rates were in agreement and were 619 mm/year and 603 mm/year for the Afton BCFS and the Highland Valley BCCL, respectively.

Knight Piesold (KP) reviewed mean annual precipitation data at active and inactive climate stations in the area as part of the 2014 climatology report (KP, 2015) and estimated an average annual precipitation for the site at 336 mm at an elevation of 950 masl, with approximately 30% of the precipitation occurring as snow. By comparison, the estimated potential evapotranspiration derived from this assessment was 585 mm. Table 4.1 below summarizes the monthly distribution presented in the KP assessment.

Table 4.1 Average Monthly Climate Data for Project Site (AJAXMET) (after KP, 2015)

Month	Average Total Precipitation (rainfall and snowfall; mm)	Potential Evapotranspiration (mm)
January	23.4	0
February	14.5	1
March	11.9	12
April	19.2	40
May	32.8	77
June	43.4	103
July	42.4	130
August	32	114
September	35.8	71
October	15.5	28
November	28	3
December	37	0
Total	**336**	**585**

4.3 Hydrostratigraphy

The hydrostratigraphy at the project site can be broadly grouped into two units: overburden and bedrock. The overburden comprises unconsolidated material associated with glacial activity and glaciolacustrine deposition, while the bedrock comprises in-situ geological units. Details of these hydrostratigraphic units are provided in the following sections.

4.3.1 Overburden

4.3.1.1 General

Overburden predominantly comprises relatively thin, discontinuous till layers. Generally, the overburden thickness decreases with increasing elevation as greater accumulation of overburden occurs along the valley floor. Previous drilling investigations across the Kamloops area have identified till thicknesses ranging from 5 to 50 m. In the project area the till generally varies from 5 m to 25 m in thickness (Klohn Leonoff, 1988; BGC, 2011), with till thickness of up to 40 m observed during the 2014 drilling program in the southern vicinity of Jacko Lake (KAX-14-130), shown in Figure 23.

Between Jacko Lake and the open pit, the till comprises low permeability dense to very dense gravelly clay-silt-sand with some cobbles. Lenses of silt, sand and gravel have been encountered within the till during drilling, and cobbles are present throughout the sequence. The moisture content across the overburden profile at the project site is variable with dry silt (including along the north arm of Jacko Lake) to saturated silty sand or well graded medium to coarse grained till. Saturation of the silty gravel lenses is also supported by the field results from the 2014 site investigation program (KCB, 2015a); with observed air lift yields from drill holes intersecting the silty gravel lenses displaying slightly higher air lift yields than the surrounding overburden material. These air lift yields were recorded as stabilized yield, measured over a prolonged duration (generally 15 minutes to 60 minutes) indicating some degree of lateral continuity in the tested intervals.

Recent drilling and test pitting completed as part of the 2014 KCB program focused on the overburden and bedrock geology between the current West Pit and Jacko Lake and within the vicinity of the eastern arm and south eastern arm of the lake. Generally, the overburden consisted of clay till with lenses of, silt, sand, gravel and cobbles; typical of overburden across the site.

Resistivity surveys were conducted by Klohn Leonoff (1988) to support the assessment of potential hydraulic pathways within silty gravel lenses of the till between Jacko Lake and the West Pit. Resistivity surveys delineate between saturated granular material (low resistivity response) and competent bedrock or dry till (high resistivity response). The area between Jacko Lake and the West Pit displayed a highly variable resistivity response, indicative of the various discrete and discontinuous stratigraphic units in the till as identified during the various drilling programs. Large zones of low resistivity response were identified in the till, indicating the presence of dry and dense clay till.

These geophysical results confirm the above interpretation of discontinuous silty, sand and gravel lenses within the till horizon. Test pitting was conducted along the shoreline of Jacko Lake, which was interpreted to have encountered sedimentary units representative of lake bed sediments. Details of lake bed sediments are provided in the following section.

The hydraulic properties of the till material is summarized in Section 4.7.

4.3.1.2 Lake Bed Sediments

Sediments along the base of Jacko Lake are interpreted to have been deposited in a low energy environment as the majority of the sediments predominantly comprise clay and silt successions. Previous test pitting within the former Jacko Lake footprint (Klohn Leonoff, 1988), and test pitting along the shoreline of Jacko Lake (also considered to be within the former lake footprint) conducted as part of the recent field investigation program (KCB, 2015a) confirmed the prominence of dense moderately plastic clay and silt in the lake bed sediments.

Acoustic profiling of Jacko Lake was undertaken in September 2014 as part of the site investigation program (Frontier Geosciences, 2014) to assess lake bathymetry and profile of lake bed sediments. The survey results indicate that the lake floor drops off rapidly from the shoreline to a depth of 15 m, gradually reaching a depth of 20 m towards the center of the lake. The maximum depth of the lake is 24 m. Five sub-layers were identified by the geophysical survey along the lake bottom. Of these, the bottom-most layer has been interpreted as the till; therefore, four layers are interpreted as lake bed sediments.

These layers comprise:

- Layer 1 – surficial lake bottom sediments; typically 1 to 2 m thick with a maximum thickness of 2.5 m;
- Layer 2 – partial sub-layer across northern and western extent of lake; typically 1 to 2 m thick with a maximum thickness of 4 m;
- Layer 3 – denser sediment layer (more clay-rich) typically 2 m thick, increasing to 4 to 7 m thickness in areas of bedrock depression with a maximum thickness of 7.9 m; and
- Layer 4 - denser sediment layer (more clay-rich) overlying till typically 2 to 3 m thick, increasing to 4 to 8 m in the centre of the lake with a maximum of 9.3 m.

The total thickness of the lake bed sediments (Layers 1 to 4) overlying the interpreted till ranges from 10 m adjacent to the lake shoreline to 14 m in the centre of the lake. Based on the acoustics survey results the lake bed sediments generally become more clay-rich (i.e. dense acoustic signature) with depth.

The hydraulic parameters for the lake bed sediments are summarized in Section 4.7.

4.3.2 Bedrock

The bedrock unit classifications developed during previous investigations have been adopted for this assessment. These generalized units comprise:

- Nicola Volcanics (NV);
- Iron Mask Hybrid Diorite (IMH); and
- Sugarloaf Diorite (SLD).

These have been adopted as hydrostratigraphic units for this assessment, with the contacts between these units (e.g. alteration zones, faults, etc.) considered in the hydrogeological context, including the picrite basalt located between the proposed pit extent and Jacko Lake. A summary of these units is provided in the following sections.

4.3.2.1 Nicola Volcanics

NV predominantly underlies Jacko Lake, forms the southern wall of the current West Pit, and will be exposed along the south west zone and a portion of the eastern extent of the ultimate proposed pit. It is interpreted the NV will be exposed across the entire depth of the southwest wall of the proposed pit.

The NV comprise three rock classifications, undifferentiated volcanics, volcanoclastics, and picrite. Lithologically, these rock classifications comprise weakly metamorphosed, relatively unaltered/unweathered interbedded tuffs, breccias and basalts. Serpentinite alteration associated with the picrite unit has been identified, and is discussed further in Section 4.3.2.4. Joints are generally tight and fractures are observed to generally be filled with clay and/or calcite. For the purposes of this investigation, the NV can be considered as a massive, largely competent rock unit.

4.3.2.2 Iron Mask Hybrid Unit

IMH lies predominantly to the north of the current West Pit and to the north and north east of Jacko Lake. This unit will be exposed across the entire northern wall extent of the proposed pit shell, which will be in close proximity to Jacko Lake. Lithologically, the IMH comprises a fine grained diorite to coarse grained pyroxenite with varying degrees of low grade metamorphism and weak alteration.

Previous geotechnical testing of the IMH, and visual inspection of intersecting drill core and exposed rock, indicate that this unit is very competent with limited fracturing/jointing. Propylitic alteration is observed within the IMH; however, the spatial distribution of this alteration is not well characterized. Scapolite alteration occurs as stockwork veining within the IMH, and may be associated with a decrease in hydraulic conductivity. Albitic alteration is also observed within the IMH along the contact with the SLD, generally associated with highly developed albitic alteration zones in the SLD.

4.3.2.3 Sugarloaf Diorite

SLD is a younger intrusive phase within the Iron Mask Batholith which consists predominantly of medium grained porphyry with hornblende and plagioclase phenocrysts in a generally aphanitic matrix. Fracturing and alteration have been previously identified in the SLD, which is less extensive than observed in the NV, and is likely associated with a relative increase in the bulk hydraulic conductivity. Geological structure within this unit is variable, with local scale faulting observed throughout the unit.

Intact strength testing results of the SLD are strong to very strong and are comparable to those for the IMH. Epidote and albitic alteration is observed in the SLD, with epidote alteration in the groundmass and veinlets, and albitic alteration strongly associated with the faulted contact with the IMH. Intact rock strength measurements for the highly albitic altered zones were extremely strong,

suggesting that the alteration increases rock competency and likely decreases hydraulic conductivity. The distribution of the albitic altered zones along the IMH-SLD contact suggests that this contact does not present a preferential pathway for groundwater flow.

The contact between the SLD and the NV units is characterized by a serpentinized picrite zone previously considered to be a potential relatively high hydraulic conductivity zone. The location of this serpentinization is in the southwest corner of the proposed pit expansion, adjacent to Jacko Lake, therefore, it was identified as an area of interest as this serpentinized picrite may be a zone of hydraulic connection between the lake and the proposed pit. Drilling and hydraulic testing conducted during the site investigation program (KCB, 2015a) focussed on the picrite zone to confirm the potential hydraulic connectivity. Inspection of the drill core, air-lift yield records and hydraulic testing indicated that the SLD is a relatively competent unit. Some minor fracturing was identified; however, this was immediately adjacent to the contact with the picrite zone and NV.

Details of the hydraulic testing results are provided in Section 4.7.

4.3.2.4 Picrite/Picritic Basalt

The picrite unit is a distinct unit within the NV, which has developed as a result of alteration along the NV-SLD contact. Serpentinized zones within the picrite unit are commonly observed, with increasing distribution along the western margin of the proposed pit. These serpentinized zones are weaker and more altered than the surrounding NV with anecdotal reports indicating common drill rod squeezing and closure during drilling programs (BGC, 2011). This observation is in contrast to the alteration in the adjacent rock units where alteration has resulted in maintaining or increasing the rock strength relative to the unaltered rock mass.

Targeted drilling and hydraulic testing of the picrite was undertaken during the site investigation program (KCB, 2015a) to understand the extent and hydraulic parameters of the unit. Drilling and associated lithological logging indicated that the characteristics of the picrite were variable ranging from a competent unit to highly fractured, altered and vuggy. Areas of lower rock competency were generally observed adjacent to the contact with the SLD; packer test results indicate that these zones of lower competency are low permeability. Details of the hydraulic testing results of this unit are provided in Section 2.2.2.

4.4 Structural Setting

The main structural elements are as follows:

- north to northwest trending (300-330 ^{o}) high and moderate angle regional faults within the NV and IMH;
- local scale faults associated with contacts between geological units; and
- inferred north-south striking normal faults intersecting the regional faults.

These structures may represent preferential pathways or barriers to groundwater flow from Jacko Lake to the proposed pit, depending on their nature, distribution and continuity.

Two major structural features lie within the local Ajax project site: the Edith Lake thrust fault, which is a regionally mapped northwest-southeast trending structure to the south of the Mine Site, and the East Fault which is mapped in the northern part of the current East Pit. The ELFZ dips at around 60 degrees (N-NE). Elsewhere the fault trace shows very little topographic deviation suggesting it does not have a shallow dip (BGC, 2014). The lateral extent of the East Fault has not been fully characterized, but is interpreted to fall almost entirely within the proposed pit expansion footprint.

The most significant fault in the Ajax Pit vicinity lies along the boundary between the IMH unit to the north and the Sugarloaf Diorite to the south, referred to as the Main Fault (ERSi, 2011 in BGC, 2011). To the west of the pit, the Main Fault strikes northwest and is inferred to form the northeast margin of the picrite unit. Targeted drilling and hydraulic testing of the Main Fault during the site investigation program (KCB, 2014) with drill hole KAX-14-121, KAX-14-128 and KAX-14-130 identified that the fault comprised zones of serpentinization and brecciation, with zones of shearing adjacent to the fault. Although the fault zone was identified as being relatively incompetent, hydraulic testing (i.e. packer testing) indicated that this zone has relatively low hydraulic conductivity. These test results suggest that although secondary porosity occurs within the Main Fault, the inter-connectivity is limited. In general, the intersected faults would either act as barriers to flow, or have similar low hydraulic conductivity properties to the surrounding bedrock.

Several small scale north-south striking high angle normal faults have been inferred from aeromagnetic survey. These faults have not been confirmed by drilling, and their extent and character are not well understood. These faults, if present, could act as conduits for groundwater flow in the absence of fault gouge, infill, or annealing Three of these small scale faults were inferred to the north of the northern arm of Jacko Lake, and one has been inferred to the south of the southern arm (Figure 2). The easternmost of the three inferred faults to the north of Jacko Lake lies within the proposed pit extent.. However, there have been no faults identified in the bedrock between the proposed pit extent and Jacko Lake. As such, these faults are not considered to present potential hydraulic pathways between Jacko Lake and the pit.

The structural geology review undertaken by ERSi identified faults with multiple orientations within, and proximal to, the proposed pit. A structural cross-section along a southwest-northeast strike between Jacko Lake and the proposed pit (across the inferred boundary faults of the picrite unit) showed little evidence for the inferred boundary faults (KCB, 2013). Additionally, no evidence of the Main Fault in the West Pit was apparent. These features are therefore not included in the groundwater modelling work.

4.5 Groundwater Recharge & Discharge Mechanisms

Groundwater recharge in the vicinity of the Ajax project is primarily a function of infiltration from precipitation and snowmelt. Relatively minor contributions to recharge have been predicted to occur from surface water infiltration at higher elevation creeks and shallow depressions. Evapotranspiration losses during the growing season will reduce the amount of snowmelt and precipitation that reaches groundwater as recharge.

Precipitation (as snow) is dominant in the winter months (November to March); otherwise, potential evapotranspiration is the dominant mechanism. Groundwater recharge occurs largely from snowmelt during the freshet.

Groundwater recharge within the Project area is influenced by orographic effects, and generally increases with elevation. Topography is influenced locally by Sugarloaf Hill (1000 m asl), the ridge system trending northwest-southeast north of the Mine Site (1000 m asl), Jacko Lake and the Peterson Creek valley (less than 900 m asl), and the existing Ajax West pits (open pit base is approximately 850 m asl in the West East pit).

Prior studies of groundwater recharge for the New Afton Mine indicate that recharge occurs as a function of snowmelt infiltration and rainfall during and immediately following the freshet (Piteau, 2006). There is little if any recharge from rainfall during the summer and fall months because of the high potential evapotranspiration.

The estimated annual groundwater recharge rate for the New Afton site was 5 mm (Piteau, 2006). This is less than 2% of the mean annual precipitation for that site (approximately 313 mm/year). For reference, groundwater recharge rates used in the regional Ajax groundwater model range from 0.5 mm/year to 10.6 mm/year which is less than 3% of the mean annual precipitation for that site (approximately 336 mm/year) (BGC, 2015).

Recharge from direct precipitation infiltration occurs into the overburden. At the bedrock contact groundwater pools due to the contrast in hydraulic conductivity and additional storage provided by minor fracturing of the bedrock surface. Over time this groundwater infiltrates into the underlying bedrock at a rate governed by the bedrock hydraulic conductivity and the head of water in the overburden. Where bedrock is of appreciably lower permeability than the overlying overburden, perched groundwater conditions result.

Test pitting of overburden material interpreted to be representative of lake bed sediments for Jacko Lake indicate that the lake bed sediments comprise dense clays and silts, typical of a low energy depositional environment, and of generally low permeability.

4.6 Groundwater Elevations & Flow

Historical groundwater level monitoring records from 59 monitoring locations, including standpipe piezometers and vibrating wire piezometers, and groundwater levels collected during the site investigation program (KCB, 2015a) were reviewed for this assessment. This is a subset of the data used in previous assessments as only locations in the vicinity of Jacko Lake and the proposed pit expansion were considered.

Piezometric and potentiometric elevation surfaces were interpreted from the groundwater monitoring records screened in overburden and bedrock (Figure 7 and Figure 8, respectively). Water elevations from the 2014 well installations and VWP readings are consistent with the regional and local groundwater elevation contours presented in the previous hydrogeological conceptualization (KCB, 2013).

In general, the piezometric surface across the local project area is a subdued reflection of the surface topography. Groundwater flow, in both the overburden and bedrock is governed by the current West Pit, with the lake in West Pit assumed to be in hydraulic connection with the bedrock, which is in connection with the overburden. This results in localized groundwater flow towards the West Pit within the vicinity of Jacko Lake and the proposed pit.

The generally shallow nature of groundwater is an important observation in consideration of the potential for the lakes and other surface water bodies to contribute seepage to the regional groundwater system. Lake elevations that are close to or slightly above groundwater elevations present only minor vertical driving head for seepage from a lake to the groundwater system. Where groundwater elevations are higher than the lake elevation, groundwater contributes to the lake water balance.

Seasonal variation in groundwater levels is consistent with precipitation and temperature trends. Seasonal fluctuations in groundwater levels range from less than 0.1 m to approximately 3 m, annually. Groundwater elevations monitored within the Project area typically decline during cooler months (i.e., September to March), and are highest during warmer months (i.e. June to September) (BGC, 2015). There was no apparent influence from Jacko Lake recorded in instruments near the lake.

Perched horizons in the overburden may not exhibit strong seasonality if their hydraulic condition is directly controlled by the nature of lower permeable bedrock, or if they are isolated as discontinuous silty, sand and gravel layers within comparatively low hydraulic conductivity till.

Groundwater flow across the Project site is from northwest to east, a general reflection of the regional topography (BGC, 2015). The localized groundwater flow regime (within the vicinity of the Ajax project) indicate that the groundwater system is influenced by the East and West pits, with groundwater flowing into the pit lakes because they are located at the lowest elevation in the local groundwater system. These localized flow regimes are apparent in both the overburden and bedrock indicating hydraulic connection between both. Estimated overburden horizontal hydraulic gradients varied from 0.019 to the northeast of the West Pit to 0.025 in the vicinity of Jacko Lake, and 0.15 proximal to the West Pit. A similar trend is observed in the bedrock piezometric surface, with horizontal hydraulic gradients ranging from 0.011 to the northeast of Jacko Lake to 0.024 in the vicinity of Jacko Lake, and 0.21 proximal to the West Pit.

Installation of groundwater monitoring instrumentation in the overburden and bedrock aquifers between Jacko Lake and the West Pit were one of the objectives of the site investigation program (KCB, 2015a). Groundwater level monitoring results from the installed instrumentation indicate a downward vertical component of hydraulic gradient exists between the overburden and the underlying bedrock, ranging from approximately 2 m to 47 m. Groundwater elevations in the bedrock, monitored at the completion of the site investigation program (KCB, 2015a) are variable across the installed monitoring facilities (i.e. monitoring wells, vibrating-wire piezometers) ranging in elevations from 845.32 m to 893 m. This variability in the bedrock groundwater elevations may be an indication of the compartmentalized nature of the bedrock (i.e. discrete zones of higher or lower parameters (hydraulic conductivity, storage)), or may be a result of the installed groundwater monitoring facilities still recovering to steady-state conditions following installation.

4.7 Hydraulic Parameters

An apparent decreasing permeability trend with depth was identified across the site (BGC, 2015). This assessment is further supported by the results of the packer testing on the competent bedrock material (unaltered, no structure – fracturing, brecciation, jointing, etc.) completed in the 2014 KCB site investigation program. Decreasing permeability with depth also typically occurs in fractured rock settings due to closure of defects with depth under increased lithostatic pressure (Singhal and Gupta, 2010).

Testing of zones of alteration and structural features between Jacko Lake and the West Pit were conducted during the site investigation program to identify the potential for these zones and/or structures to influence groundwater flow between Jacko Lake and the proposed pit. Targeting testing of the picrite unit (zone of alteration, incompetent material) and various zones of faulting, brecciation and fracturing indicated that the picrite unit typically displayed higher hydraulic conductivity (approximately 10^{-7} m/s) while the tested structural zone displayed values similar to the competent bedrock (10^{-8} to 10^{-9} m/s).

Although the hydraulic conductivity of the picrite unit relative to the surrounding bedrock is higher, air-lift yield tests indicate that the storage in this unit is limited as the yields could only be sustained over a short duration (15 to 30 minutes). Hydraulic testing of the overburden material was conducted during previous investigations using infiltration testing, slug testing and test pumping techniques. This testing indicates that the overburden hydraulic conductivity varies widely from 10^{-10} m/s to 10^{-4} m/s, considered to reflect the range in composition of the overburden material from silt and clay to sand and sandy gravel.

A summary of the hydraulic conductivity for the various hydrostratigraphic units are provided in Table 4.2.

Table 4.2 Summary of Hydrostratigraphic Unit Hydraulic Conductivity

Hydrostratigraphic Unit		Hydraulic Conductivity (m/s)		
		Minimum	Maximum	Geomean/Representative
Overburden	Post-glacial outwash	1×10^{-7}	1×10^{-4}	1×10^{-5}
	Till	1×10^{-8}	1×10^{-5}	1×10^{-7}
	Morainal	1×10^{-10}	8×10^{-6}	3×10^{-8}
	Glaciofluvial	1×10^{-9}	9×10^{-4}	2×10^{-6}
Bedrock	IMH	2×10^{-10}	2×10^{-6}	1×10^{-8}
	SLD	3×10^{-9}	8×10^{-7}	2×10^{-8}
	NV (competent)	3×10^{-10}	2×10^{-7}	8×10^{-8}
	Picrite	5×10^{-9}	4×10^{-7}	1×10^{-7}
	Picrite / NV Contact	3×10^{-9}	3×10^{-7}	6×10^{-8}
	NV (fractured/brecciated/faulted)	4×10^{-9}	8×10^{-8}	3×10^{-8}

5 3D PREDICTIVE NUMERICAL MODELLING (MODFLOW)

5.1 Objectives and Modelling Platform

The objective of the numerical modelling was to assess seepage rates from Jacko Lake to the proposed Ajax Pit.

The finite difference platform MODFLOW, using the Visual MODFLOW 2012 graphical user interface and Hydrogeologic Limited MODFLOW-SURFACT (version 3) solver, was adopted to simulate the saturated groundwater environment. Conceptualization of the hydrogeological system within the vicinity of the Ajax deposit, and proposed mine infrastructure formed the basis for model development.

5.2 Modelling Approach

The conceptual understanding of the hydrogeology at the project site was translated into the groundwater model by incorporating the morphology of the overburden into the model domain; while the discrete features and geological units of the fractured bedrock were incorporated using the Equivalent Porous Media (EPM) method. This methods allows the numerical representation of fractured rock by simulating their bulk hydraulic parameter (hydraulic conductivity, specific storage) distributions with a continuous porosity medium, having so-called equivalent or effective hydraulic properties (Anderson and Woessner, 2002).

The model was developed to simulate the response of the groundwater system to the proposed Ajax open pit development and its influence on Jacko Lake. This model was initially developed and calibrated to steady state conditions. Transient simulations were undertaken for the main duration of the proposed mine schedule (17 years when the pit is fully developed) to simulate the potential effect of open pit development on both the groundwater and surface water systems in order to determine the seepage from Jacko Lake to the open pit and potential mitigation needs to minimize seepage.

5.3 Model Domain

The model domain was modified from BGC (2011). Information on BGC (2015) was not available during KCB model development as the two studies have occurred in parallel. The model domain is presented in Figure 9 and covers an area of approximately 860 km^2 oriented north-south. The model domain is bounded by Kamloops Lake / Thompson River in the north and Campbell Creek to the east. The southwestern boundary is aligned along an inferred groundwater divide.

The model mesh was refined around the proposed pit and the Jacko Lake area and hydrogeological units of significance within the immediate vicinity of the proposed pit. The model domain boundaries were selected based on the results of the analytical assessment of the groundwater level drawdown extent to establish domain boundaries beyond the anticipated extent of groundwater level drawdown. By adopting a more extensive model domain, predicted groundwater inflow to the pit

tends toward conservatism due to the greater area of groundwater storage made available in the model.

The model grid comprises 211 rows and 366 columns (65,000 total cells per layer). The cell size varied across the model domain from 10 m within the vicinity of Jacko Lake and the proposed pit to 1,000 m at the model extents. The horizontal dimension of the grid cells were incrementally expanded away from Jacko Lake and the proposed pit to reduce run complexity in areas of reduced importance.

5.4 Model Layers

Based on the proposed mining configuration the model domain has been constructed with 17 layers. A summary of the model layer representation is provided in Table 5.1.

Table 5.1 Simplified Numerical Model Layer Summary

Model Layers	Conceptual Representation
Layer 1	Overburden and Jacko Lake Bed Sediment (based on geophysics details)
Layer 2	Overburden
Layer 3 to 17	Bedrock Geology and 3D Mine Geological Model

The upper surface for the model (i.e. the upper surface for Layer 1) represents the surface topography, which was derived using 0.5 m LIDAR over the proposed pit area and Jacko Lake, mosaicked with coarser topographic data (5 m elevation contours (KAM data transfers in 2013 updated with LIDAR in March 2015) away from the mining area. Layer 1 thickness varied across the site with a nominal thickness of 10 m applied to the layer away from the mining area and where overburden thickness is not well understood. In the vicinity of the Ajax pit and Jacko Lake, Layer 1 thickness varied based on recent geophysical surveys and site investigations. The base of Layer 2 was set at depth of 40 m across the model domain based on model thickness values defined in BGC (2011).

Layer 3 to 14 thicknesses were generally assigned a standard of 50 m based on a review of the proposed pit shell bench elevations and to provide sufficient resolution to allow assessment of related pit inflow. Layers 5 and 6 were an exception with these layers assigned a thickness of 25 m based on specification in BGC (2011). Layers 15 to 17 were set at a thickness of 200 m.

The base of the numerical model was extended to an elevation of RL-1,000 m to mitigate the effect that shallow structured models can have on impeding prediction of deeper groundwater flow regimes.

5.5 Boundary Conditions

5.5.1 General-Head Boundaries

The major lakes across the model domain were represented as General-Head Boundaries (GHB) to simulate a source or sink to the groundwater system based on the simulated groundwater heads (Figure 10). Lakes which are known or suspected to be permanent and/or in connection with groundwater were simulated. This boundary type enables the use of a conductance term to control

the degree of seepage from the lake to the underlying geology (e.g. the influence of lake bed sediments on lake infiltration).

The (lake bed) conductance values assigned to Jacko Lake are based on field testing and values presented in the BGC model, with a value of $1x10^{-7}$ m/s applied. The elevation head assigned to the GHB was based on the lake water surface elevation. Jacko Lake was assigned a constant average elevation of 891.45 mRL, based on field survey results. The calculation of seepage from the lake into groundwater is then determined by the model based on the relative difference between the lake elevation and the underlying groundwater elevation, controlled by the conductance value of the lake bed sediments.

5.5.2 Rivers Boundaries

Major creeks and streams in the vicinity of the proposed mining area were simulated in the model domain using the River boundaries package (Figure 10). This boundary condition allows both the introduction or removal of water in the model based on relative the groundwater elevation. If groundwater elevations are above the simulated creek/stream elevation, then water is removed from the model (representing discharge into the surface environment) while water is introduced to the model when groundwater level elevations are below the simulated creek/stream elevation.

For each of the river cells, the water level elevation and riverbed elevation was applied based on the topography elevation and base of Layer 1, respectively, as per BGC (2011). Conductance of the river cells was calculated based on the average horizontal dimension of the cell, an assumed channel width of 1 m, for small creek, and 3 m for Thompson River, and a creek bed conductance value of 1×10^{-7} m/s. Conductance values assigned in the model were based on BGC (2011).

5.5.3 Recharge

Recharge was applied across five zones in the model. The recharge values used in the model were based on calibrated values from BGC (2011). Recharge rates applied were equal to approximately 1% of total annual precipitation. Figure 11 and Table 5.2 provide details of the spatial distribution and recharge used in the model.

Table 5.2 Numerical Model Recharge Values

Zone	Value (mm /yr)
Recharge Zone 1	2.9
Recharge Zone 2	2.8
Recharge Zone 3	3.6
Recharge Zone 4	3.9
Recharge Zone 5	4.2

5.5.4 Hydraulic Parameters

Preliminary hydraulic parameter values applied in the model are summarized in Table 5.3. The distribution of hydraulic conductivity and storage across the model domain was based on the conceptual description of the system provided in Section 4.

The upper two layers of the model the overburden materials and bedrock sub-crop. Assigned values and extents are based on BGC (2011) which were based on surficial geology mapping conducted by Fulton (1975) and geophysical surveying of Jacko Lake bed and underlying sediments (KAM, 2014).

Model layers representing the fractured bedrock (Layers 3 to 17) comprise simplified regional geology in areas away from the proposed pit, with updated detailed geology from the site 3D geological model applied to the immediate pit area. Geological data and boundaries for the pit area were developed based on layer elevations and where the various geological (lithological) units intersected centroids of the groundwater model grid. Based on the results of site testing the bedrock is generally considered to be massive and comprises little primary porosity and low permeability.

Inferred faults and/or fracture networks (collectively, “structural features”) encountered during the 2014 site investigation program were generally observed to be closed and/or filled with gouge; hydraulic testing indicated that these structural features were not apparent preferential conduits for flow and often reflected similar material properties to the surrounding structurally intact rock fabric. For this reason, faults have not been explicitly represented in the model as they have no distinctly different hydraulic parameters than the surrounding rock mass (KCB, 2015a and BGC, 2011).

Table 5.3 provides a summary of the preliminary hydraulic conductivities applied to the model based on values from BGC (2011) supplemented with recent field testing (KCB, 2015a).

Table 5.3 Preliminary Hydraulic Conductivity and Storage Values

Id	Geology	K (m/s)			S_S	Sy
		Kx	Ky	Kz		
1	Lacustrine (Layer 1)	1e-6	1e-6	1e-6	5e-5	0.3
2	Till (Layer 1)	1e-6	1e-6	1e-6	1e-6	0.3
3	Bedrock Outcrop (Layer 1)	7e-8	7e-8	7e-8	2.5e-5	0.05
4	Lacustrine (layer 2)	1e-8	1e-8	1e-8	5e-5	0.3
5	Till (Layer 2)	1e-8	1e-8	1e-8	1e-6	0.3
6	Bedrock Outcrop (Layer 2)	1e-8	1e-8	1e-8	2.5e-5	0.3
7	Nicola Volcanics	2e-9	2e-9	2e-9	1e-6	0.01
8	Regional metamorphics	1e-8	1e-8	1e-8	1e-6	0.01
9	Regional Sediments	1e-8	1e-8	1e-8	1e-6	0.01
10	Regional Ultramafic	1e-8	1e-8	1e-8	1e-6	0.01
11	Regional Intrusives	2e-9	2e-9	2e-9	1e-6	0.01
12	Picrite	1e-7	1e-7	1e-7	4.5e-6	0.001
13	SLD	1e-8	1e-8	1e-8	4.5e-6	0.001
14	IMH	6e-9	6e-9	6e-9	1e-6	0.001

Note additional zones are applied to the model to differentiate the geology between layers even when the hydraulic conductivity is similar.

5.6 Model Calibration

The model was calibrated to steady-state conditions to assess the representation of the conceptualized hydrogeological system in the numerical domain and to establish a pre-development

groundwater condition for simulations. This simulated potentiometric surface from the calibration was used as the initial (starting) head for transient simulations.

Groundwater elevations recorded at wells installed across the study area were used as targets in the calibration process. Due to limited time series groundwater level measurements, average annual head values were used as the steady state targets. These averaged annual values were provided by BGC (pers. comm. December 9, 2014) based on BGC (2011) and updated to include more recent water level data. Also due to limited time series data the effects of seasonal variations on groundwater levels and seepage flux have not been included as part of this modelling.

Steady state model calibration initially involved automated parameter estimation using WinPEST by applying input hydraulic conductivity parameters presented in Table 5.3. All remaining model parameters remained constant throughout the calibration process. Preliminary WinPEST calibration was limited to a single order of magnitude variation of hydraulic conductivity, which is constrained by the conceptual understanding of the site and from hydraulic testing results. During the WinPEST runs, model sensitivities to changes in hydraulic parameters for Layer 1 were observed; and are considered to likely be a result of the thin layer thickness. Following automated calibration, further trial and error manual adjustments were undertaken to specific hydrogeological units to improve calibration performance.

5.6.1 Steady State Calibration Results

A total 121 monitoring locations were selected to assess the suitability of calibration. Of these monitoring locations, 25 are vibrating wire piezometers, 51 are monitoring wells, 44 are standpipe piezometers, and one is a production well. Monitoring locations and the calibrated steady state heads are presented in Figure 12.

Heads simulated for the overburden layer (Layer 2) and bedrock layer (Layer 4) show similar distribution across the area (Figure 12). Generally, groundwater flow is from south to north with movement towards Thompson River and Kamloops Lake in the north. Local variations occur across the site associated with topographic and geographic features (lakes and water courses). This is consistent with the conceptual understanding of the site, where Jacko Lake is considered a through flow system.

Figure 13 presents a scatter plot of observed average groundwater elevations versus model simulated heads. The correlation coefficient for comparison of observed groundwater elevations with simulated elevations is 0.87, indicating a reasonable match. The root mean square (RMS) for the steady state calibration was 8.3%, which is below suggested normalized RMS error guideline value of 10% (BC MoE, 2012). The overall mean error of 2.3 m indicates a minor positive bias which suggests a slight under prediction of simulated head values. Table 5.4 present the summarized Steady State Model calibration statistics.

Table 5.4 Summary of Steady State Model Calibration

Statistical Metric	Calibration Metrics: Phreatic, Steady State Model (units)
Number of primary head calibration targets	121
Normalized RMS	8.3%
Minimum Residual	0.09 m
Maximum Residual	-57.3 m
Mean Residual	2.3 m
Correlation Coefficient	0.87

Major discrepancies in head values are observed away from the pit and Jacko Lake, particularly in areas of significant elevation variation. Figure 14 presents the spatial distribution of the calibrated residuals for observed versus modelled.

Calibrated Hydraulic Conductivity and Storage Parameters

Table 5.5 summarizes the calibrated hydraulic conductivities for the model hydrostratigraphic units, with a comparison between the final calibrated values and summarized field derived value presented in Figure 15 (where available). Also presented in Table 5.5 are updated storage values which were adjusted systematically based on experience in similar hydrogeological regimes and recent field investigations. The spatial distribution of calibrated hydraulic conductivity values for the overburden geology and bedrock geology are presented in Figure 16 and Figure 17 respectively.

Table 5.5 Steady State Calibrated Hydraulic Conductivity Parameters

Id	Geology	K (m/s)			SS	Sy
		Kx	Ky	Kz		
1	Lacustrine (layer 1)	6.8e-6	6.8e-6	6.8e-6	5e-3	0.3
2	Till (Layer 1)	1.4e-7	1.4e-7	1.4e-7	1e-4	0.3
3	Bedrock Outcrop (layer 1)	4.1e-7	4.1e-7	4.1e-7	2.5e-3	0.05
4	Lacustrine (layer 2)	1.4e-7	1.4e-7	1.4e-7	5e-3	0.3
5	Additional Rock Unit (layer 1) – based on BGC Vistas model geology	3e -8	3e -8	3e -8	1e-4	0.3
5	Till (Layer 2)	8.9e-8	8.9e-8	8.9e-8	1e-4	0.3
6	Bedrock Outcrop (layer 2)	1e-8	1e-8	1e-8	2.5e-3	0.05
7	Nicola Volcanics	8.8e-10	8.8e-10	8.8e-10	5e-5	0.01
8	Regional metamorphics	7.5e-8	7.5e-8	7.5e-8	1e-6	0.01
9	Regional Sediments	1e-9	1e-9	1e-9	1e-6	0.01
10	Regional Ultramafic	1e-7	1e-7	1e-7	1e-6	0.01
11	Regional Intrusives	3.4e-9	3.4e-9	3.4e-9	5e-5	0.01
12	Picrite	1.8e-7	1.8e-7	1.8e-7	5e-4	0.01
13	SLD	7.1e-8	7.1e-8	7.1e-8	1e-4	0.01
14	IMH	2.7e-9	2.7e-9	2.7e-9	5e-5	0.01

5.7 Predictive simulations

A series of transient simulations to assess seepage from Jacko Lake to the proposed pit, and to examine the total potential pit seepage inflows over the duration of the pit development, have been completed. Details of these simulations are presented in the following sections.

Sensitivity analyses, comprising variation of groundwater parameters and Jacko Lake bed conductance, were completed to assess the effect of uncertainty associated with these key model parameters and to identify the potential variation in predicted groundwater seepage inflow rates. Details of the sensitivity analysis are presented in Section 5.8.

5.7.1 Jacko Lake Seepage Simulation Overview

The seepage from Jacko Lake into the underlying groundwater system was undertaken by determining the flux transfer from model Layer 1 to Layer 2 and 3 within the applied lake boundary extent of Jacko Lake, and along the east margin of the lake and Ajax pit. Determination of seepage flux from the lake was undertaken during each time step of the model.

The progressive expansion of the pit and associated pit dewatering was simulated by applying drain cells along the advancing pit floor at defined time steps during the transient model duration. Drain cells simulate removal of groundwater from the domain where the groundwater elevation is above the drain cell elevation. In reality, this represents (in this case) seepage of groundwater into the pit. The modelling presented uses this drain approach as an estimate of passive inflows; that is, dewatering well pumping (as an example) is not simulated. This is a reasonable assumption given the generally low permeability of the bedrock.

The predictive simulation comprised the following:

- The model was simulated over 17 years based on the proposed End of Phase Pit (EOP) Development (KAM, 2015). The existing open pit was incorporated into the model topography as a starting condition.
- Recharge over the model domain was unchanged from the steady state simulation for areas outside the pit extent. Recharge rates within the expanding pit shell was set to 0 mm/year.
- The MODFLOW drain boundary package was used to simulate the development of the Ajax pit. For the purpose of the transient simulation and to assess seepage from Jacko Lake, drain cells were setup to simulate the flow of groundwater into the pit. To permit unimpeded flow of water the conductance of the drain cells was assigned a value between 10 m^2/day to 200 m^2/day, with values increasing as the pit depth increased, to accommodate the increase in hydraulic head towards the centre of the pit.
- The proposed EOP development schedule was used to assign the drain cell elevations within each model layer. Drains representing the pit shell bench and floor elevations for every 2 years of mining were applied and activated progressively over the model duration.

- Zone budgets have been applied to allow the recording of fluxes associated with Jacko Lake bed sediments and till, and the Ajax pit. Figure 18 presents the water balance zone budgets assigned to the transient base case simulations.

5.7.2 Simulation Results

Figure 19 presents the simulated infiltration from Jacko Lake to the underlying till/overburden material (Layer 2) and to the zone between the eastern lake boundary and the western pit boundary (see Zone budget). This indicates that seepage toward the Ajax pit, and into the underlying till/overburden material, commences after approximately two years of pit development. Seepage rates steadily increase over the duration of the simulation (17 years) to approximately 50 m^3/day (0.6 L/s).

Predicted groundwater inflow into the Ajax pit prior to two years (i.e., 0 to 730 days) is from upgradient of the pit and is not influenced by Jacko Lake. After about two years, the predicted groundwater inflow to the pit and seepage from Jacko Lake increases as a result of the drawdown from the pit dewatering propagating to the unconsolidated sediments below the lake. This increases the vertical hydraulic gradient from the lake to the groundwater system, which consequently increases the seepage from the lake. However, because of the low permeability sediments below the lake, the amount of seepage is relatively small (Figure 19).

Lateral seepage from Jacko Lake is predicted to occur due to the direct removal (excavation) of lake sediment in the northeastern arm of Jacko Lake as the pit expands in model Layers 1 and 2. The seepage toward the pit is predicted to reach a peak seepage rate of approximately 11 m^3/day (0.13 L/s) after approximately two and a half years (900 days); predicted inflow rates then slightly decrease to 10.5 m^3/day (0.12 L/s) and remains relatively constant for the duration of the simulation. Seepage is controlled by conductance and groundwater head potential. As Layer 1 and 2 are dewatered and become dry, the hydraulic head in the lake continues to discharge toward the pit at a rate proportional to the GHB conductance term assigned to Jacko Lake.

It is acknowledged that these lake loss estimates are low. By comparison, the west pit is producing very low inflow rates with Jacko Lake surface elevations remaining relatively constant. While the proposed pit will be closer to Jacko Lake, it provides useful contrast for potential seepage inflow. Such a condition confirms the low permeability nature of the geology in the area, and without the development of a strong dewatering influence on the lake, there is no driver for substantial change in vertical gradients. There is also no mechanism to change the material properties of the overburden or bedrock such as mining induced fracturing, discussed in later sections.

5.8 Sensitivity Analysis

The hydraulic conductivity of overburden and bedrock units near the pit were the most sensitive model parameters adjusted during calibration. Sensitivity analyses were conducted to assess:

- which adjustable hydraulic parameters were the most sensitive during calibration; and

- the potential range of seepage and pit inflows rates based on variability in key parameters within plausible upper and lower bounds.

Manual qualitative sensitivity analyses were performed on selected hydraulic parameters for the transient simulation. Systematic incremental variation of parameters was conducted within predefined ranges which are provided in Table 5.6.

Table 5.6 Summary of Sensitivity Analyses

Sensitivity Run	Modification
Sensitivity Run 1	Increase overburden hydraulic conductivity by an order of magnitude
Sensitivity Run 2	Decrease overburden hydraulic conductivity by an order of magnitude
Sensitivity Run 3	Increase lake conductance by an order of magnitude
Sensitivity Run 4	Decrease Bedrock hydraulic conductivity by an order of magnitude
Sensitivity Run 5	Increase Bedrock hydraulic conductivity by an order of magnitude

The model boundary conditions (GHB, Recharge and Drains) from the transient simulation were retained for the sensitive analyses simulations. Zone budgets were also retained to allow comparison of potential inflow to the 'Base Case' transient simulation.

A summary of the peak seepage from Jacko Lake and pit inflows for each of the sensitivity simulations are provided in Table 5.7.

Table 5.7 Summary of Predicted Seepage and Groundwater Inflow – Sensitivity Analysis

Sensitivity Run	Peak Jacko Lake Seepage
1	To Pit Edge -1.2 L/s, To Till Layer – 4 L/s
2	To Pit Edge -< 0.01 L/s, To Till Layer – 0.07 L/s
3	To Pit Edge -0.03 L/s, To Till Layer – 0.6 L/s
4	To Pit Edge -0.12 L/s, To Till Layer – 0.4 L/s
5	Model sensitive to K increase – unable to achieve convergence; addressed using analytical methods

An interpretation of the sensitivity analyses results are as follows:

- Simulated seepage from Jacko Lake for the various sensitivity analyses indicates that seepage flux values are sensitive to changes in hydraulic conductivity of the surrounding till/overburden materials with an order of magnitude increase in seepage rates from Jacko Lake (from 0.4 to 4 L/s). This is an expected outcome and highlights the importance of understanding the distribution and continuity of material properties in the overburden sequence.
- Seepage values from Jacko Lake do not appear sensitive to decreases in bedrock hydraulic conductivity and increases in lake bed conductance (i.e. GHB conductance). Regardless of changes to hydraulic conductivities seepage from Jacko Lake to the Ajax pit is generally low (0.03 L/s toward the pit edge and 0.6L/s to the underlying till). Again, this is an expected outcome as the controlling measure on the ability of the lake to release water to the regional groundwater system is the thickness and permeability of the lake bed sediments and till, and the vertical driving head. The predictive simulation showed a measured response in the lake bed seepage as a result of the drawdown effects from mining reaching Jacko Lake; however, the amount of seepage increase was not significant.
- Results of sensitivity runs 2 and 3 are very similar. Increasing the model's boundary condition ability to release water has not changed the amount of water reaching the regional groundwater system significantly as the physical presence of low permeability sediments ultimately control the vertical propagation of this water into bedrock. This is a positive observation as it identifies that variation in lake bed conductance in the model does not have a lineal response to seepage rates. The distribution of the underlying material appears to have a greater influence on the potential for lake losses.
- Sensitivity run 4 resulted in predictable reduction of pit inflows with reducing rock mass permeability.

5.9 Modelling Results Alternative Comparisons

A series of alternate analyses were undertaken to provide a review of results from the numerical flow model. These analytical solutions were included as an 'order of magnitude' independent point of reference. Such calculations provide a useful tool for comparative purposes and for further assessing sensitivities of parameters, and included the following:

- SEEP/w 2D modelling; and
- 1D partially saturated flow estimation (Vick, 1990).

Additional details about the application of these solutions, input parameters and estimates are discussed in the following sections.

5.9.1 2D Seep/W Analysis

Overview

2D modelling was undertaken by KCB to assess the effects of pit expansion towards Jacko Lake in support of pit depressurization assessments completed by others.. The analysis included the following:

- change to the ultimate pit configuration (November 2014 Mine Plan revision);
- updates to the KAM Geological Block Model (March 2015 revision);
- incorporation of lake geophysical data for thickness and distribution of lake bed sediments and till underlying Jacko Lake;
- site investigation data (Guelph Permeameter hydraulic conductivity estimates) completed in August 2014 outside of the Jacko lake footprint but within the high water mark (proxy lake bed sediment data); and
- KCB conceptual dyke design for the NE arm dyke (KCB, 2015).

The SEEP/W modelling was intended to provide a preliminary assessment of pore pressure distribution between Jacko Lake and the proposed ultimate pit. Steady state and transient scenarios were completed for the following scenarios:

- basecase – excludes pit dewatering infrastructure; and
- mitigated – includes horizontal drains (150 m to 300 m into the pit wall from the pit) based on BGC design proposed to assist with pit depressurization.

Mitigation scenarios are not discussed in this report as they pertain to depressurization design, not specifically to the potential hydraulic connectivity between Jacko Lake and the proposed pit.

Sensitivity scenarios were completed for both the basecase and the mitigated scenarios to assess the impact of conservative parameter estimates (i.e., higher hydraulic conductivity) for the overburden and bedrock. Cross-section A represents the “worst-case” scenario, as it reflects the largest encroachment of the pit within the Jacko Lake footprint where seepage is considered to be likely highest.

Results

Overall, the transient analyses produced pore pressure distributions that are similar to the equivalent transient MODFLOW results after 10 to 15 years of simulation, with only minor changes in subsequent years. The sensitivity scenarios produced similar pore pressure distributions and phreatic surfaces for the basecase steady-state scenarios. For Section A, the transient models for all lake elevations show effectively steady-state conditions after 15 years of simulation.

For the basecase scenarios, sensitivity analysis 1 results in markedly different head distribution, groundwater gradients, seepage velocities, and pore pressure distributions in the early years of the transient simulations. Equilibrated (long-term / steady state) pore pressure distributions are similar.

Table 5.8 summarizes the modelled unit flux and total estimated flux from Jacko Lake to the surrounding bedrock for Section A for a Jacko Lake elevation of 892 masl, with the vast majority reporting to the proposed pit.

Table 5.8 SEEP/w Estimated Flux Results from Jacko Lake to the surrounding bedrock (after KCB, 2015)

Model Scenario	Modelled unit flux ($m^3/s/m$)	Estimated Total Flux* (m^3/s)	Estimated Total Flux* (L/s)
Basecase	3.2×10^{-6}	2.1×10^{-3}	2.1
Sensitivity 1 – 1 order of magnitude increase in hydraulic conductivity for all units	3.2×10^{-5}	2.1×10^{-2}	20.8

*: based on an estimated 650 m North-South length of Jacko Lake along the eastern extent of the lake.

The flux values estimated through the SEEP/w analyses are similar but generally slightly higher to those derived from the MODFLOW model.

5.9.2 Seepage1D partially saturated flow

Analytical estimates of predicted seepage fluxes from Jacko Lake were prepared for comparison to the numerical flow model and sensitivity analysis results. Steady state one-dimensional partially saturated seepage was calculated using the analytical approach by Vick (1990). This approach is designed to predict seepage through raised tailings facilities so is not a direct representation of the situation at Jacko Lake. However, the approach was applied as it allows variation in lake bed conditions (permeability), and represents a raised saturated system of varying material properties. The intent of this calculation is to provide an indicative vertical flux only so this should not be construed to be an accurate estimate of lake bed losses.

Hydraulic parameter input values used for the assessment were based on field investigation results, which were also used for the numerical flow model (Table 4.2 and Table 5.5). For an equivalent lake area for Jacko Lake of 500,000m^2, an average lake depth of 14m, and till and lake bed sediments thickness of 40 m and 7 m respectively, and material properties consistent with those defined in Section 5.5, this predicts total lake losses to be about 7 L/s. Sensitivity analyses of this approach are possible, however provides little value to the overall assessment due to the highly assumptive approach applied. The result is however useful to confirm the order of magnitude losses presented in the MODFLOW predictions.

5.10 Modelling assumptions and Limitations

The following assumptions and limitations are associated with the groundwater modelling completed for this investigation:

- Seasonal variability of the recharge cycle has not been accounted for. Average observed groundwater elevations have been used for steady state calibration. The calibration dataset was provided from BGC Engineering (BGC, pers. comm. December 9, 2014).

- Evapotranspiration has not been explicitly modelled, but rather included as part of the effective recharge, with recharge applied directly to the water table.
- The ridgelines have been assumed as no flow boundaries and regional discharge is assumed to flow to the Thompson River. Underflow of the entire system was not considered.
- The model has not been calibrated to transient conditions.
- The fractured bedrock groundwater flow system has been represented by an equivalent porous medium (EPM) method. One of the inadequacies of an EPM method is that although it replicates the behavior of a regional flow system well, it is less suitable to reproduce small scale variations in conditions.
- In pit backfill (i.e. increase in pit bench elevations in successive mine years) is not included in the model pit shell elevations assigned to the drain boundary conditions, with pit bench elevations adopted from the previous pit shell if they were deeper.
- The model does not account for nor do we expect any significant changes in rock mass permeability as a result of mining activity (such as rock pressure relaxation and fracturing from blasting activity). The unlikely influence of construction and development impacts to rock and overburden conditions (e.g., faults) have not been considered.
- Model domain and parameters (e.g. K, river conductance, recharge etc.) adopted from BGC 2011.
- The inability to conduct invasive site investigation activities within the footprint of Jacko Lake limits verification of geophysics and assumptions in the numerical model.
- Uncertainty remains in the understanding of anisotropy and storage parameters between Jacko Lake and the current and proposed pit, particularly for the overburden. However, as most potential flow is conceptualized to occur through the bedrock, the uncertainty in the overburden characterization will not likely affect the conclusions of this assessment.

6 CONCLUSIONS

The following conclusions can be made from this Jacko Lake hydrogeological assessment:

- Overburden between Jacko Lake and the proposed pit consists primarily of low permeability clay till, with discontinuous sand/gravel lenses of varying thicknesses and limited continuity. Overburden thickness varied from approximately 10 m (KAX-14-121) to 40 m (KAX-14-107), with increasing thickness to the south.
- Bedrock between Jacko Lake and the proposed pit has low hydraulic conductivity. The hydraulic conductivity of competent (i.e., non-fractured, or infilled fractures) bedrock estimated from packer testing was generally 10^{-8} to 10^{-9} m/s. The hydraulic conductivity of fractured bedrock (predominantly picrite) estimated from packer testing was typically higher and around 10^{-7} m/s.
- The inferred Jacko lake bed sediment has a low hydraulic conductivity resulting in minimal seepage loss from Jacko Lake (estimated representative hydraulic conductivity of 9 x 10^{-8} m/s from proxy infiltration tests; consistent with soil descriptions). Inferred Lake bed thickness ranges from 8 m to 12 m, and the underlying till ranges from 2m to 6 m. Minimum overall thickness of material above the bedrock contact is inferred to be 4 m to 6 m. The interpreted Jacko Lake bottom surface and the bedrock contact derived from the lake geophysics program are similar, suggesting that the shape and profile of Jacko Lake is controlled predominantly by the shape of the bedrock surface.
- No discrete hydraulic conduits (e.g., open faults) were observed between Jacko Lake and the proposed pit. Packer testing across and within the void structure (KAX-14-124) and the fault structure (KAX-14-130) indicate that neither of these structures are preferential conduits for flow (representative hydraulic conductivity of ~10^{-9} m/s). Other inferred faults and shear zones were generally closed and/or infilled with clay or gouge.
- During the seven day constant rate bedrock pumping test, appreciable drawdown was only observed in one bedrock monitoring well (KAX-14-128D), which yielded an estimated transmissivity of 3.4 x 10^{-6} m^2/s (hydraulic conductivity of 3.4 x 10^{-8} m/s based on a thickness of 100 m), and a storativity value of 0.002 – 0.006.
- Drawdown in overburden observation wells during the constant rate test suggests a transmissivity of 3.4 x 10^{-6} m^2/sec. Results also suggest that the glacial till has higher permeability than the bedrock by approximately 1-2 orders of magnitude.
- Seepage from Jacko Lake toward the open pit is predicted to be <1.0 L/s, when the pit is fully developed, under steady state conditions (0.6 L/s seepage to the underlying till, and 0.1 L/s laterally toward the pit).
- Sensitivity Analysis was conducted on the hydraulic conductivity and Jacko Lake bed sediment conductance to assess the range in seepage flux and potential inflow due to changes in these parameters. Results indicate that seepage from Jacko Lake is most sensitive to changes in hydraulic conductivity in the surround overburden materials.

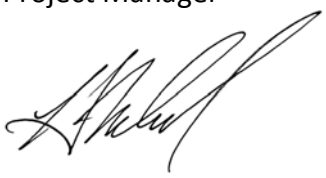
7 CLOSING

This report is an instrument of service of Klohn Crippen Berger Ltd. The report has been prepared for the exclusive use of KGHM Ajax International (Client) for the specific application to the Jacko Lake Hydrogeological Assessment. The report's contents may not be relied upon by any other party without the express written permission of Klohn Crippen Berger. In this report, Klohn Crippen Berger has endeavoured to comply with generally-accepted professional practice common to the local area. Klohn Crippen Berger makes no warranty, express or implied.

We trust that the contents of this report meet your current needs.

Yours truly,
KLOHN CRIPPEN BERGER LTD.

Jonathan Sanders, B.Env.Sc. EP
Project Manager



Harvey McLeod, P.Eng, P.Geo
Senior Reviewer

REFERENCES

Anderson, M. and Woessner, W. 1991. Applied Groundwater Modeling: Simulation of Flow and Advective Transport.

BGC. 2011. Open Pit Geotechnical and Hydrogeological Assessments.

BGC. 2011a. Ajax Project Feasibility Study – Prototype Dewatering Well and Pumping Test.

BGC. 2014. Edith Lake Thrust Fault Investigation. October 2014

BGC. 2015. Numerical Groundwater Flow Model. April 22, 2015

ERSi. 2011. Structural Review of Ajax East and Ajax West Deposits.

Frontier Geosciences Inc. 2014. Bathymetric and Sub-Bottom Acoustic Profiling Survey: Jacko Lake, Kamloops, BC.

Klohn Leonoff. 1988. Ajax Mine Project: Hydrogeology Study

Klohn Crippen. 1997. Afton Mine Tailings Impoundment: Closure Water Management Planning report

Klohn Crippen Berger Ltd. 2013. Ajax – Jacko Lake Hydrogeology Assessment – Preliminary Hydrogeological Conceptualization – Draft.

Klohn Crippen Berger Ltd. 2014a. Ajax – Jacko Lake Hydrogeology Assessment – Site Investigation Work Plan – Rev A

Klohn Crippen Berger Ltd. 2014b. “Ajax – Jacko Lake Hydrogeology Assessment – Summary of 2D SEEP/w Modelling – Draft.

Klohn Crippen Berger Ltd. 2015a. Ajax – Site Investigation Report.

Klohn Crippen Berger Ltd. 2015b. Ajax – Summary of Supplemental 2D SEEP/W Modelling.

Knight Piésold. 2012. Ajax Project Baseline Hydrogeology Data Summary; Baseline Watershed Model for Jacko Lake.

Marinelli, F., and Niccoli, W. 2000. Simple Analytical Equations for Estimating Ground Water Inflow to a Mine Pit. Ground Water, V.38., No. 2.

Piteau Associates. 2006. New Afton Copper-Gold Project MAPA reports.

Singhal, B.B.S. and Gupta, R.P. 2010. Applied Hydrogeology of Fractured Rocks: Second Edition.

Vick, S.G. 1990. Planning, design and analysis of tailings dams. BiTech Publishers Ltd.

Wardrop (2012). Ajax Copper/Gold Project – Kamloops, British Columbia: Feasibility Study Technical Report

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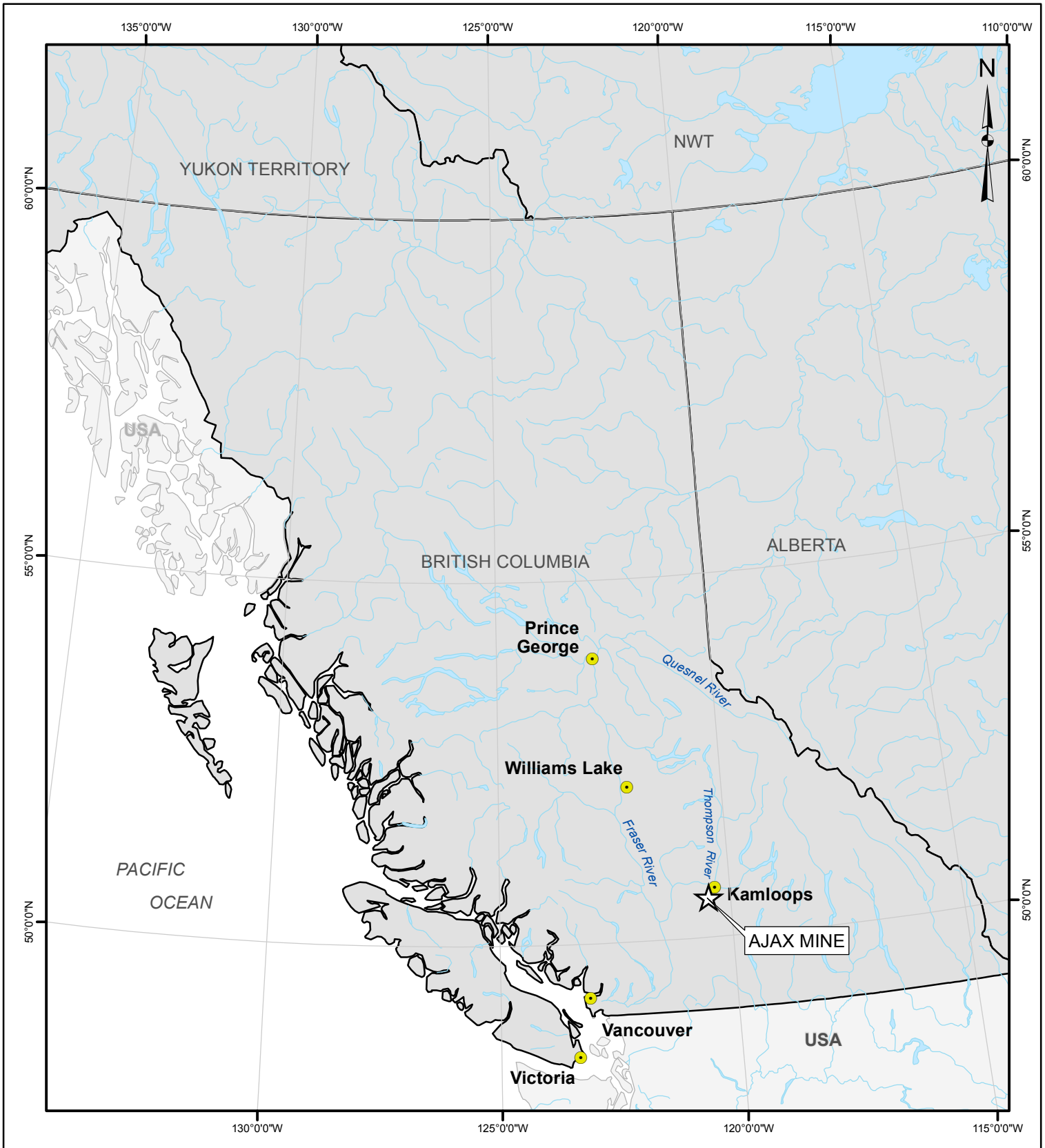

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CLIENT: KGHM INTERNATIONAL AJAX PROJECT

Klohn Crippen Berger

PROJECT: AJAX MINE
JACKO LAKE HYDROGEOLOGY ASSESSMENT

TITLE: PROJECT LOCATION

PROJECT No. M09871A01

FIG No. 1

NOTES:
1. Coordinate System: WGS 84

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5,610,000 5,609,500 5,609,000

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JACL-M
JACL-S
JACL-D
JACL-02
JACL-03
Jacko Lake
See Inset
TP-1B
TP-1A
AW-10-106
TP-8B
TP-8A
AW-10-118
AJWW-D
AJWW-S
AW-10-105-D
AW-10-105-S
KAX-14-121
KCB14-TP1
KCB14-TP2
AJGW07-D
AJGW07-S
West Pit
AJWE-D
AJWE-S
BGC10-MWA
BGC10-PW01
BGC10 MWB
R88-1
TP-2
R88-2
KAX-14-128
KAX-14-124
AJGW01-D
AJGW01-S
KAX-14-108
R88-4
DDH88-7
AW-09-103-S
AJGW02-D
AJGW02-S
AW-09-104
AW-09-103-D
AJGW03-D
AJGW03-S
AJGW04-D
KAX-14-114
KAX-14-130
TP-3
JACLAKE
KAX-14-107
TP-7
JACSEEP
PC-EF-04
TP-6
TP-5
R88-3
TP-10
TP-4
WR-SEEP

Inset
0 50m
Jacko Lake
KCB14-HA6
KCB14-HA2
KCB14-HA4
KCB14-HA1
KCB14-TPA
KCB14-HA3
KCB14-TPB
KCB14-HA5
KCB14-TPC
KCB14-HA7
KCB14-TPD
KCB14-HA8
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LEGEND

2014 Site Investigation Program
- KCB 2014 Drillhole
- KCB 2014 Hand Auger
- KCB 2014 Test Pits
- Inclined Drillhole Trace (Approximate)
- KP Monitoring Boreholes
- BGC Production Boreholes

Test Pits
- KLCB Test Pits (1988)
- KLCB Test Holes (1988)

Hydro
- KP/BGC Surface Water Sites
- KP/BGC Water Level & Discharge Sites
- BGC Piezometers

Bedrock Geology
- IMH
- NV
- SLD

- Edith Lake Thrust Fault
- Inferred Local Scale Faults (ERSi, 2011)
- Kinder-Morgan Pipeline
- Pipeline Setback Boundary (Asssumed 40m setback)
- Proposed Pit Extent
- Existing Pit Boundary

- Index Contour (20m)
- Intermediate Contour (5m)
- Lakes
- Rivers

Notes:
1. UTM Zone 10N, NAD83
2. Map data sources are provided by KGHM International
3. Proposed pit provided by KGHM May 2014
4. Imagery provided by Bing Aerial Imagery.
5. Bedrock Geology based on Ajax Feasibility Study, 2011 and 2014 Geological Block Model.

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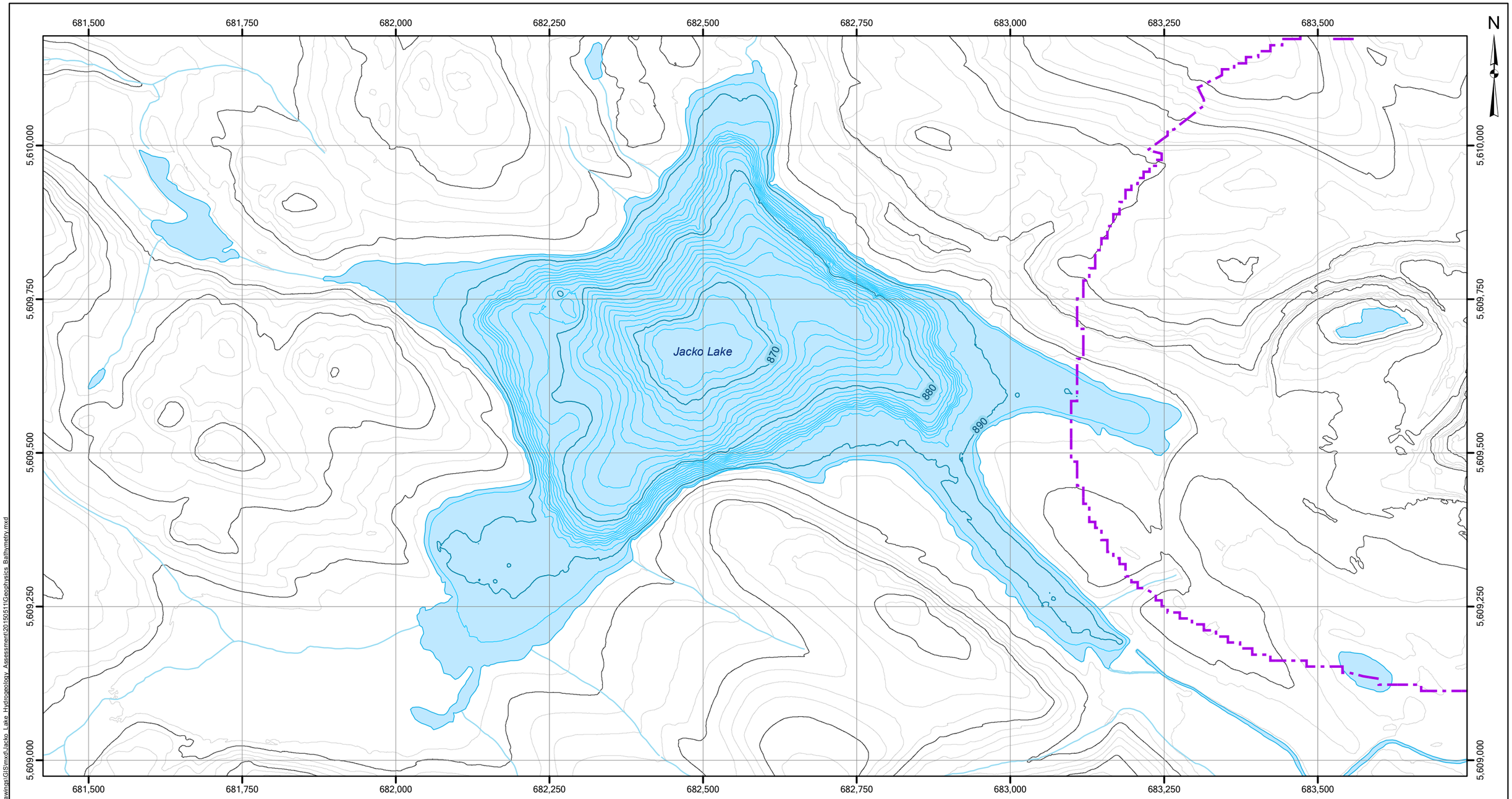
AJAX MINE
JACKO LAKE HYDROGEOLOGY ASSESSMENT

TITLE
Site Plan

PROJECT No. M09871A01

FIG No. 2



LEGEND

Bathymetry

- Minor (1m)
- Index (10m)
- Proposed Pit
- Lakes
- Rivers

Notes:
1. UTM Zone 10N, NAD83
2. Map data sources are provided by KGHM International
3. Proposed pit provided by KGHM May 2014
4. Bathymetry provided by Frontier Geosciences Inc. (2014)

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TITLE

Geophysics - Bathymetry

PROJECT No. M09871A01

FIG No. 3

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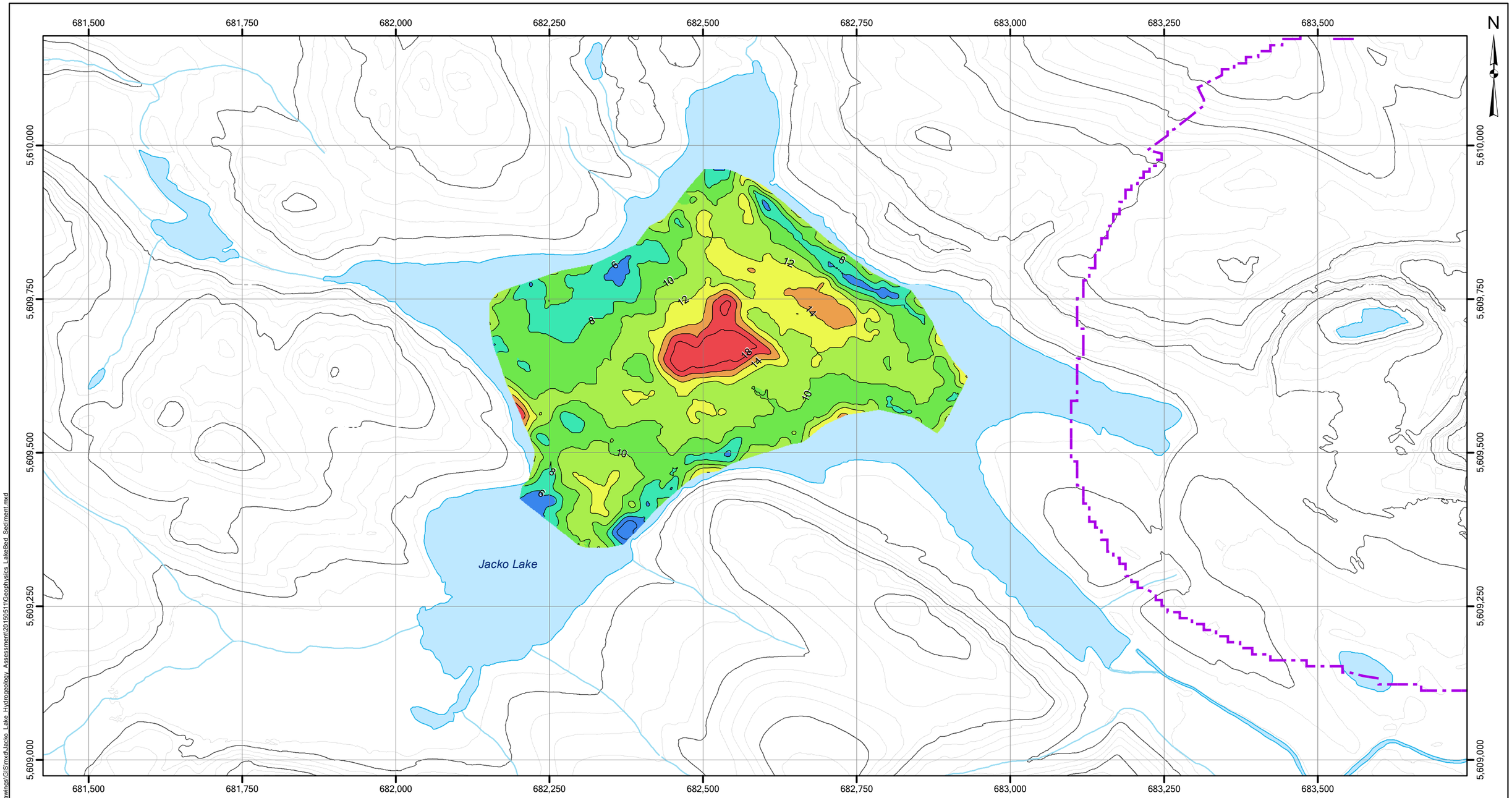

LEGEND

Inferred Lake Bed Sediment Thickness (m)

- 0 - 6
- 6 - 8
- 8 - 10
- 10 - 12
- 12 - 14
- 14 - 16
- 16 - 18

- Lakes
- Rivers
- Proposed Pit

Notes:
1. UTM Zone 10N, NAD83
2. Map data sources are provided by KGHM International
3. Proposed pit provided by KGHM May 2014
4. Lake Bed Sediment Isopach provided by Frontier Geosciences Inc. (2014)

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0 250m

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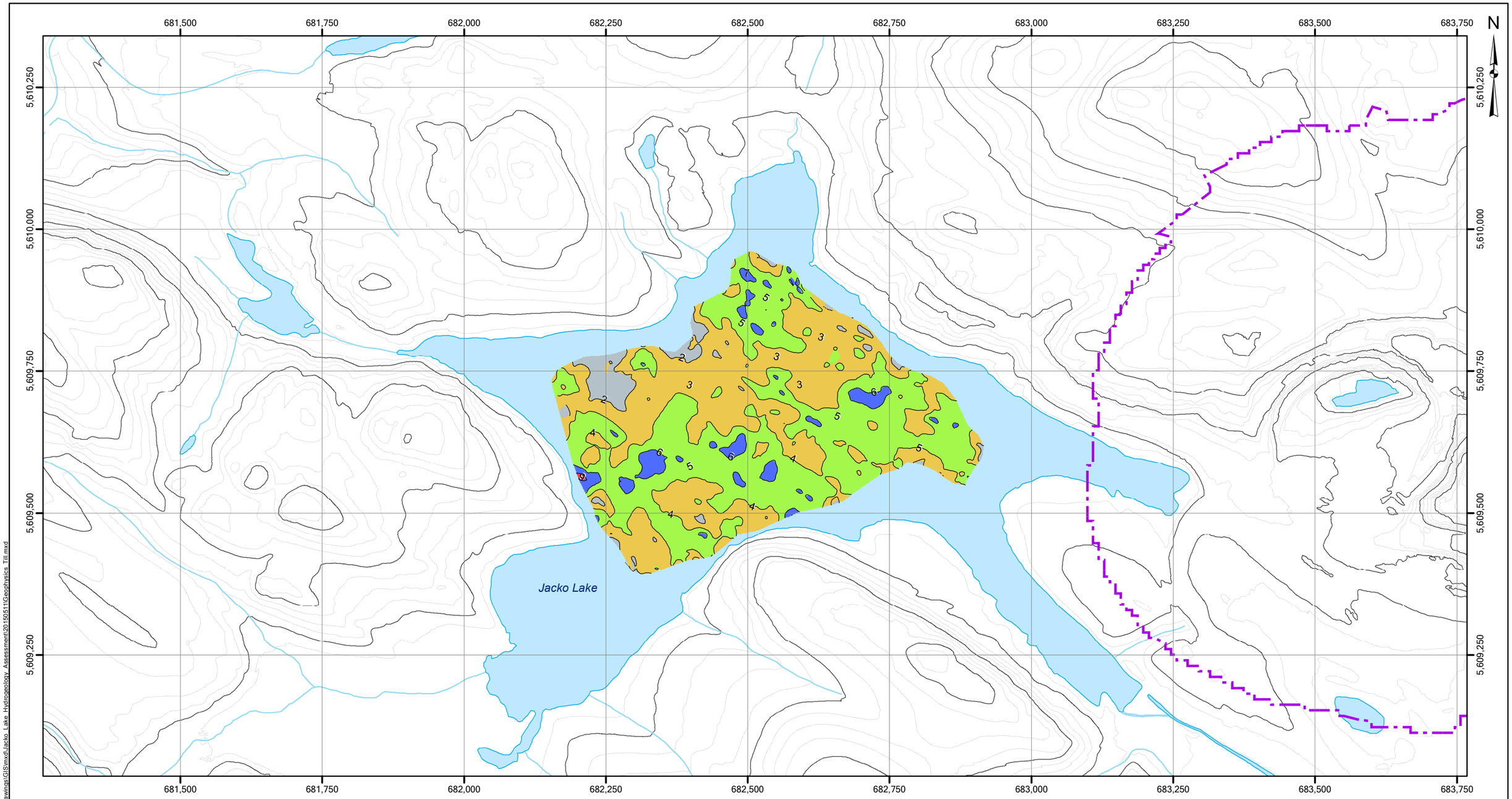
TITLE: Geophysics - Lake Bed Sediment Thickness (Isopach)

PROJECT No. M09871A01

FIG No. 4

Path: Z:\MV\CR\M09871A01-KGHM-Ajax Copper-Gold\400 Drawings\GIS\mxd\Jacko_Lake_Hydrogeology_Assessment\20150511\Geophysics_LakeBed_Sediment.mxd



LEGEND

Till Thickness (m)

- 0 - 2
- 2 - 4
- 4 - 6
- 6 - 8
- 8 - 9

- Lakes
- Rivers
- Proposed Pit

Notes:
1. UTM Zone 10N, NAD83
2. Map data sources are provided by KGHM International
3. Proposed pit provided by KGHM May 2014
4. Till isopach provided by Frontier Geosciences Inc. (2014)

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0 250m

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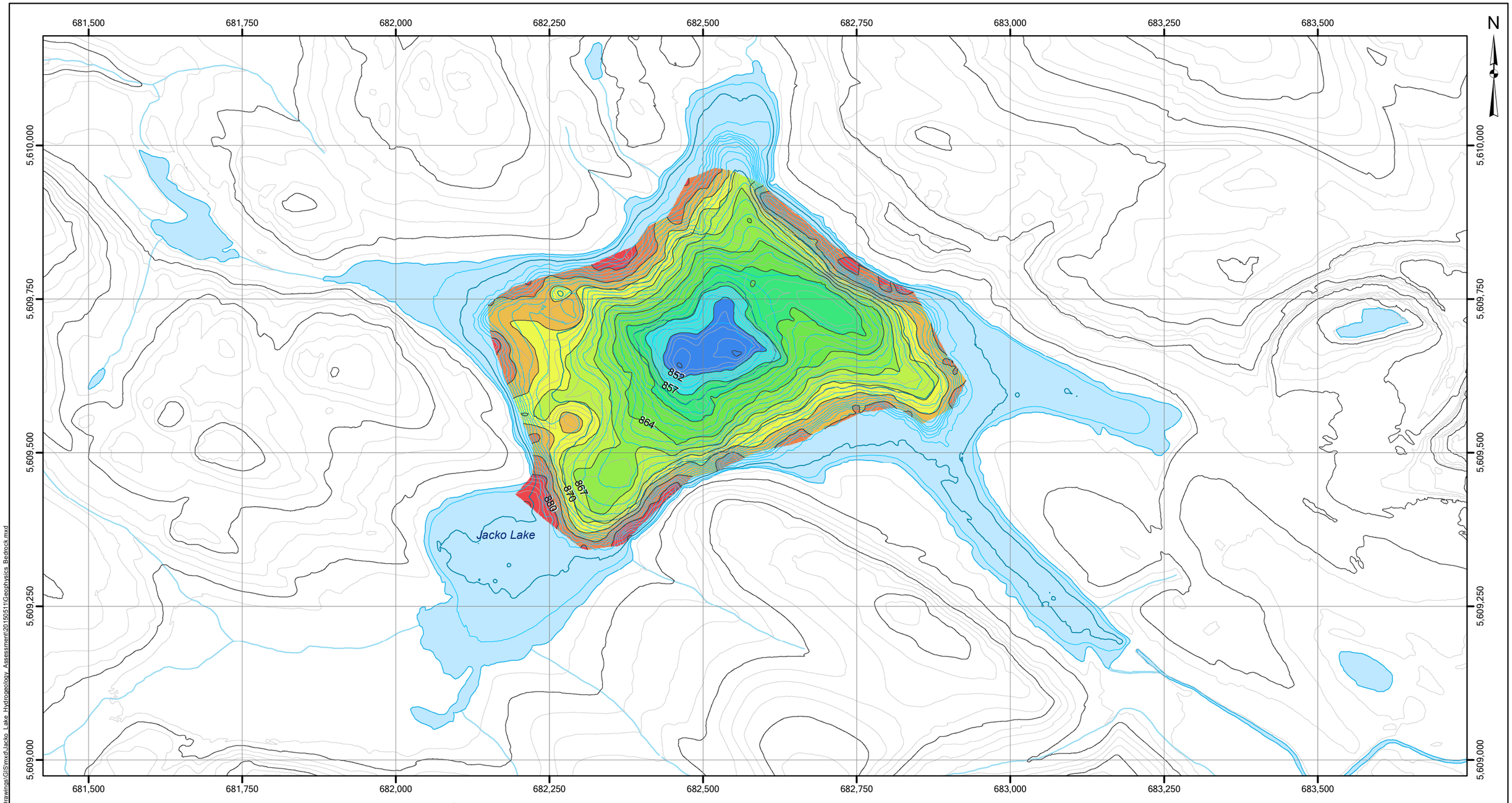
JACKO LAKE HYDROGEOLOGY ASSESSMENT

TITLE: Geophysics - Till Thickness (Isopach)

PROJECT No. M09871A01

FIG No. 5

Path: Z:\MV\CR\M09871A01-KGHM-Ajax Copper Gold\400 Drawings\GIS\mxd\Jacko Lake Hydrogeology Assessment\20150511\Geophysics Till.mxd



LEGEND

Bedrock Elevation (m)

- 848 - 852
- 852 - 857
- 857 - 860
- 860 - 864
- 864 - 867
- 867 - 870
- 870 - 873
- 873 - 876
- 876 - 880
- 880 - 885

Lakes

Rivers

Bathymetry

Elevation

Minor (1m)

Index (10m)

Notes:
1. UTM Zone 10N, NAD83
2. Map data sources are provided by KGHM International
3. Proposed pit provided by KGHM May 2014
4. Bedrock Elevation provided by Frontier Geosciences Inc. (2014)

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0 250m

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TITLE

Geophysics - Bedrock Elevation

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FIG No. 6

Path: Z:\MV\CR\M09871A01-KGHM-Ajax Copper Gold\400 Drawings\GIS\mxd\Jacko_Lake_Hydrogeology_Assessment\20150511\Geophysics_Bedrock.mxd

682,000 682,500 683,000 683,500 684,000

N

5,610,000

5,609,500

5,609,000

Jacko Lake

West Pit

900 890 880 870 860 850 840 910

0 250m

Legend

- Proposed Pit Extent
- Lakes
- Rivers
- Existing Pit Boundary
- Topographic Contours (5 m)
- Groundwater Contours (10 m)
- Inferred Groundwater Contours (10 m)

Notes:
1. UTM Zone 10N, NAD83
2. Map data sources are provided by KGHM International
3. Proposed pit provided by KGHM May 2014
4. Groundwater contours interpolated from water levels measurements provided by KGHM

Path: Z:\MV\CRM\09871A01-KGHM-Ajax Copper Gold\400 Drawings\GIS\mxd\Jacko_Lake_Hydrogeology_Assessment\20150511\Overburden_Piezo.mxd

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JACKO LAKE HYDROGEOLOGY ASSESSMENT

TITLE
Piezometric Surface (Overburden Groundwater Contours)

PROJECT No. M09871A01

FIG No. 7

682,000 682,500 683,000 683,500 684,000

N

5,610,000

5,609,500

5,609,000

Jacko Lake

West Pit

880 890 900 910 920 870 860 850 840

0 250m

Legend

- Proposed Pit Extent
- Lakes
- Rivers
- Existing Pit Boundary
- Topographic Contours (5 m)
- Inferred Groundwater Contours (10 m)
- Groundwater Contours (10 m)

Notes:
1. UTM Zone 10N, NAD83
2. Map data sources are provided by KGHM International
3. Proposed pit provided by KGHM May 2014
4. Groundwater contours interpolated from water levels measurements provided by KGHM

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Klohn Crippen Berger

PROJECT: AJAX MINE
JACKO LAKE HYDROGEOLOGY ASSESSMENT

TITLE: Potentiometric Surface (Bedrock Groundwater Contours)

PROJECT No. M09871A01

FIG No. 8

Path: Z:\MV\CR\M09871A01-KGHM-Ajax Copper Gold\400 Drawings\GIS\mxd\Jacko_Lake_Hydrogeology_Assessment\20150511Bedrock_Potent.mxd

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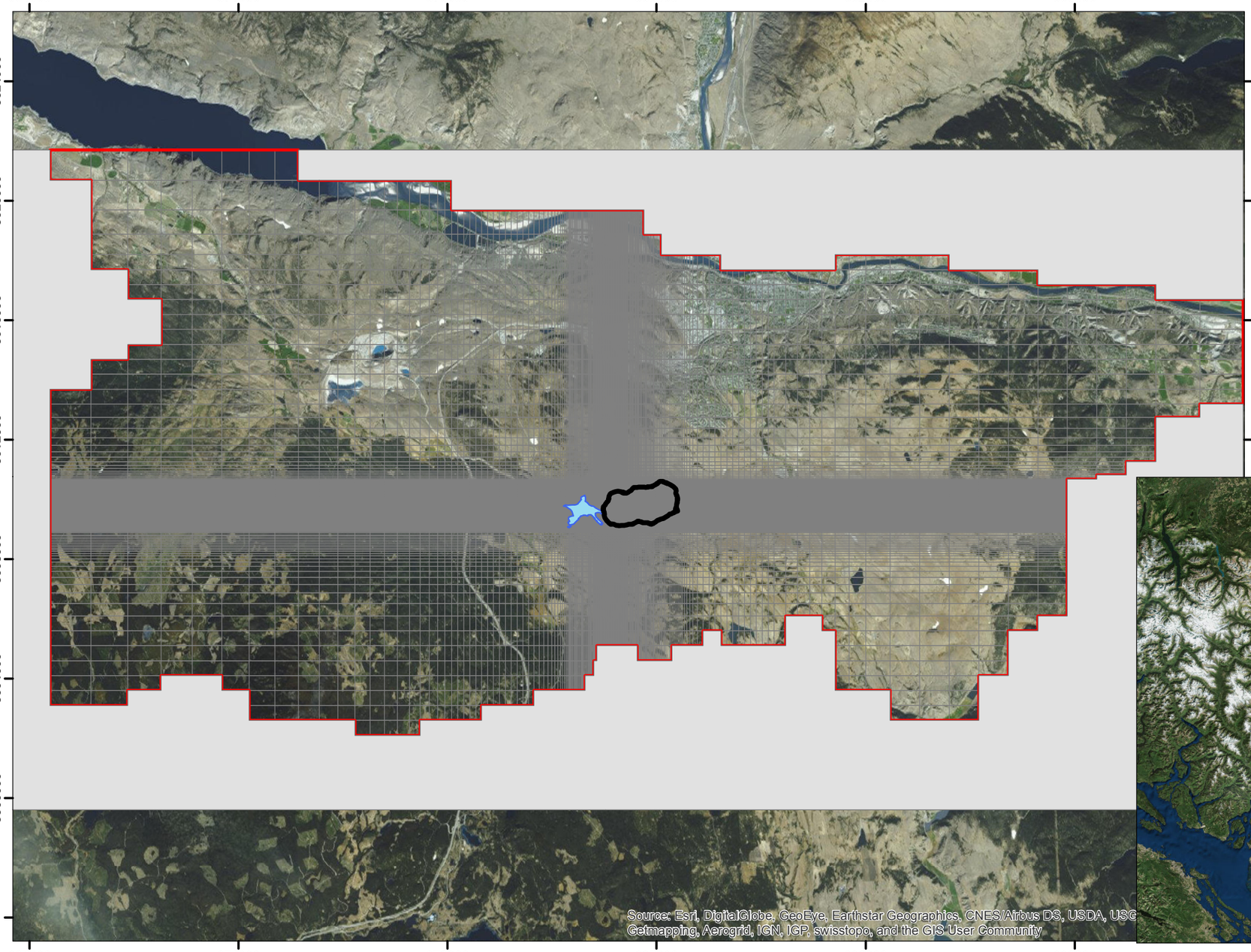

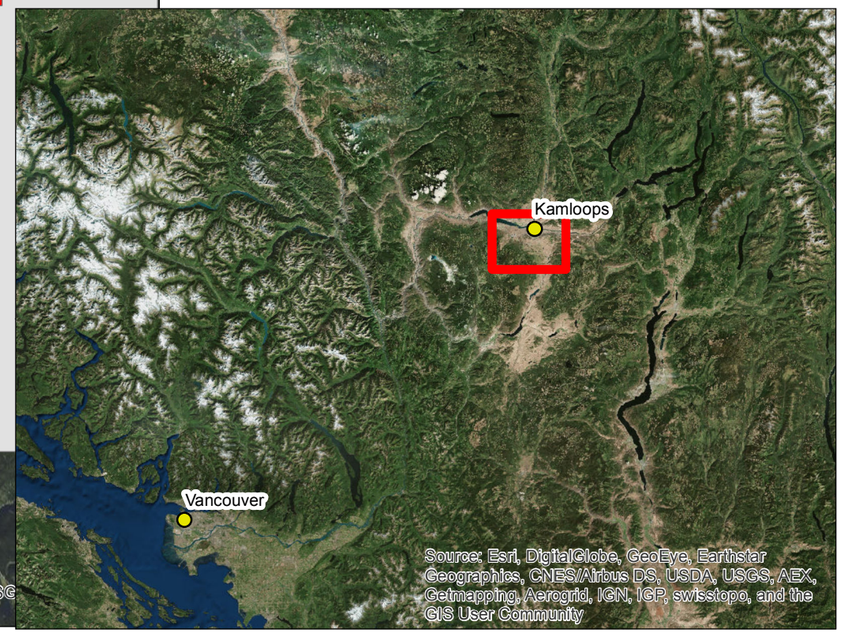

Legend

- Proposed Ajax Pit
- Numerical Model Boundary
- Inactive Cells
- Locations

NOTES:
1. Projection: North America UTM Zone10N
2.Topographic contours are in metres above sea level (masl).

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1:150,000
1 0.5 0 1 2 3 4 Kilometers

N

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CLIENT
KGHM Ajax Mining Inc

Klohn Crippen Berger

PROJECT
Jacko Lake Hydrogeology Assessment

TITLE
GROUNDWATER NUMERICAL MODEL DOMAIN

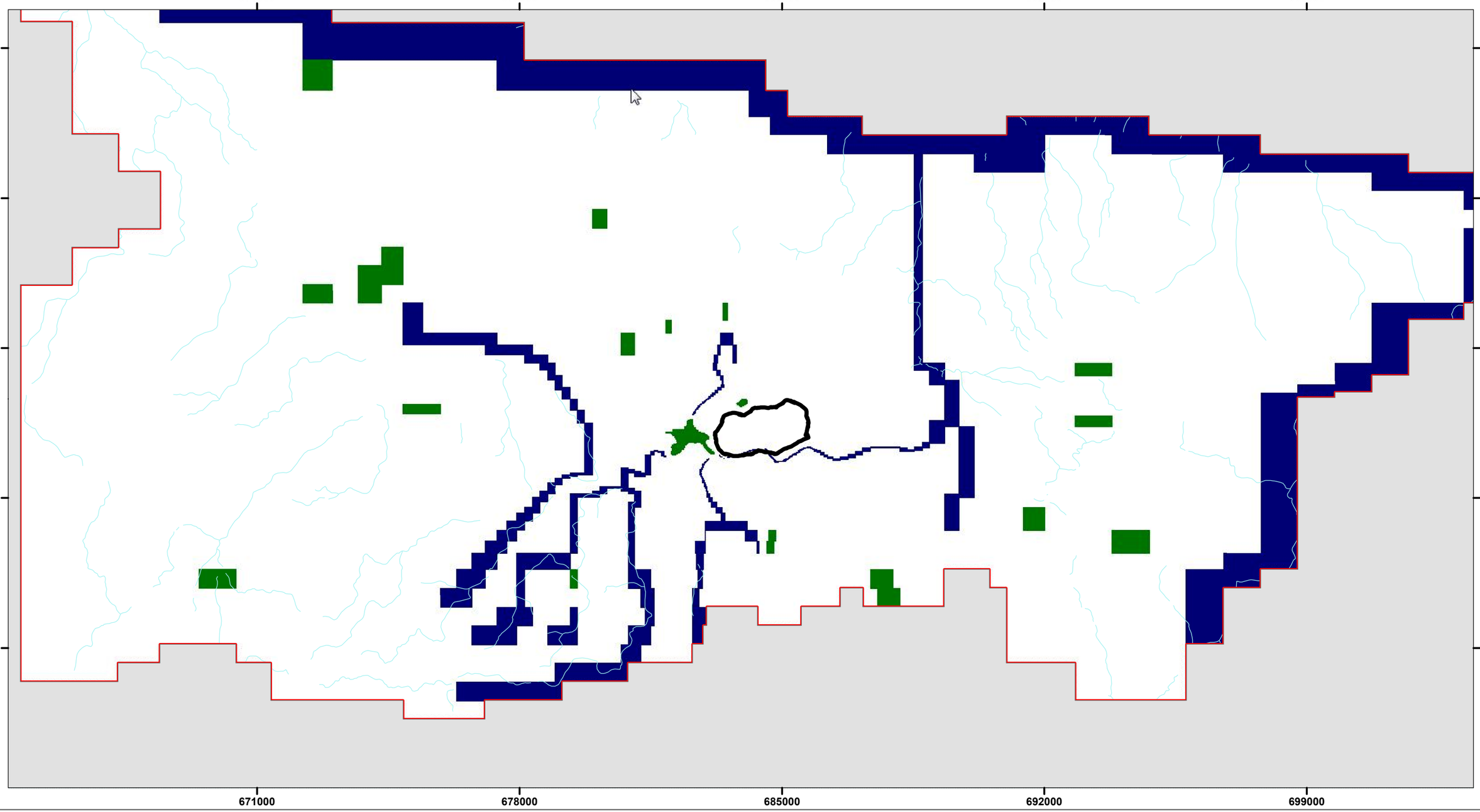
PROJECT No. M0971A01

FIG No. 9

\\int.klohn.com\Proj\Data\DIBNE\Vancouver Projects\M09871A01 Ajax\400 Drawings\ArcGIS\Figure X Model Domain.mxd

671000 678000 685000 692000 699000

5620000 5616000 5612000 5608000 5604000



Legend

- Proposed Ajax Pit
- Numerical Model Boundary
- Inactive Cells
- NRCAN Watercourse
- General Head Boundary
- River Boundary

NOTES:
1. Projection: North America UTM Zone10N
2.Topographic contours are in metres above sea level (masl).

N

NOT FOR CONSTRUCTION | DRAFT

0 1:100,000 5Kilometers

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CLIENT: KGHM Ajax Mining Inc

Klohn Crippen Berger

PROJECT: Jacko Lake Hydrogeology Assessment

TITLE: GROUNDWATER NUMERICAL BOUNDARY CONDITIONS

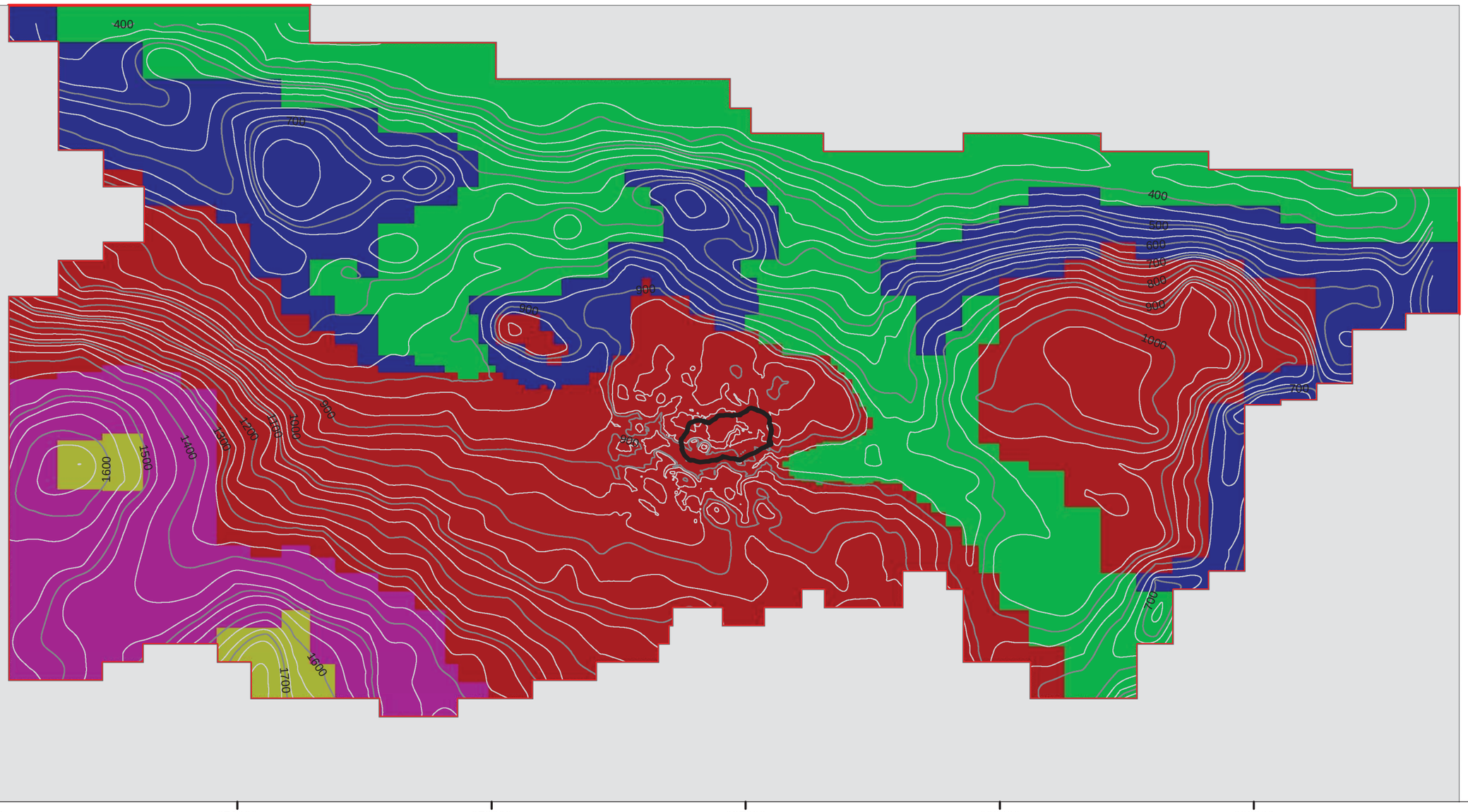
PROJECT No. M0971A01

FIG No. 10

\\int.klohn.com\Proj\Data\DIBNE\Vancouver Projects\M09871A01 Ajax\300 Design\Spatial\ArcGIS\GIS\mxd\Brisbane_working\Figure X Boundary Zones.mxd

664000 671000 678000 685000 692000 699000 706000

5620000 5616000 5612000 5608000 5604000 5600000



Legend

- Proposed Ajax Pit
- Numerical Model Boundary
- Inactive Cells
- Contours

Boundary

- Recharge = 2.8 mm/yr
- Recharge = 2.9 mm/yr
- Recharge = 3.6 mm/yr
- Recharge = 3.9 mm/yr
- Recharge = 4.2 mm/yr

NOTES:
1. Projection: North America UTM Zone10N
2.Topographic contours are in metres above sea level (masl).

NOT FOR CONSTRUCTION

0 1:116,095 5Kilometers

N

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CLIENT
KGHM Ajax Mining Inc

Klohn Crippen Berger

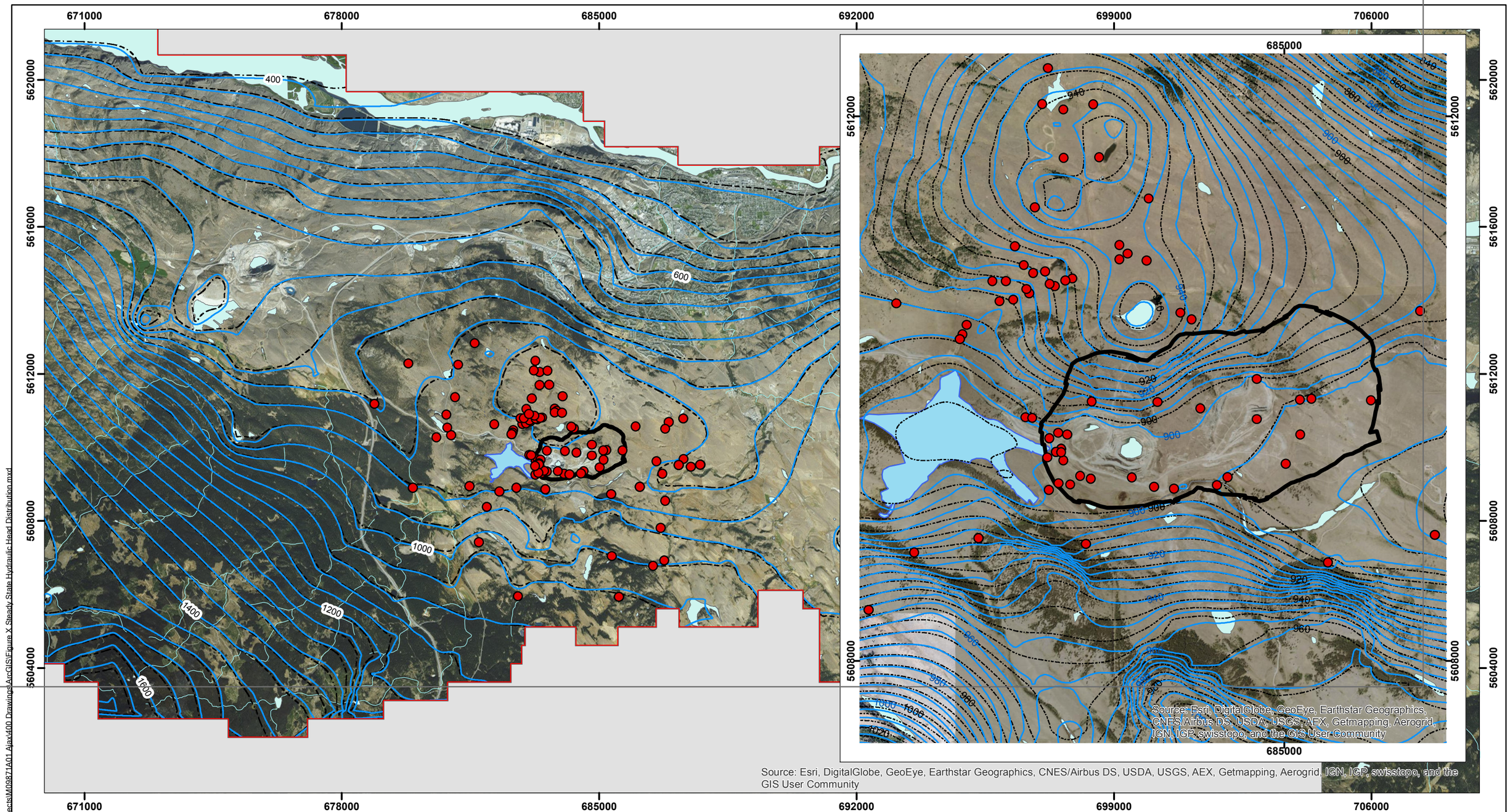
PROJECT
Jacko Lake Hydrogeology Assessment

TITLE
GROUNDWATER NUMERICAL RECHARGE DISTRIBUTION

PROJECT No. M0971A01

FIG No. 11

\\int.klohn.com\Proj\Data\DIBNE\Vancouver Projects\M09871A01 Ajax\400 Drawings\ArcGIS\Figure X Recharge Zones .mxd



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

1:100,000

0 0.5 1 2 3 4 5 Kilometers

Legend

- Model Observation Wells
- Proposed Ajax Pit
- Numerical Model Boundary
- Inactive Cells
- NRCAN Watercourse
- Layer 2 SS Calibrated Groundwater Heads
- Layer 4 SS Calibrated Groundwater Heads

NOTES:
1. Projection: North America UTM Zone10N
2.Topographic contours are in metres above sea level (masl).

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CLIENT
KGHM Ajax Mining Inc

Klohn Crippen Berger

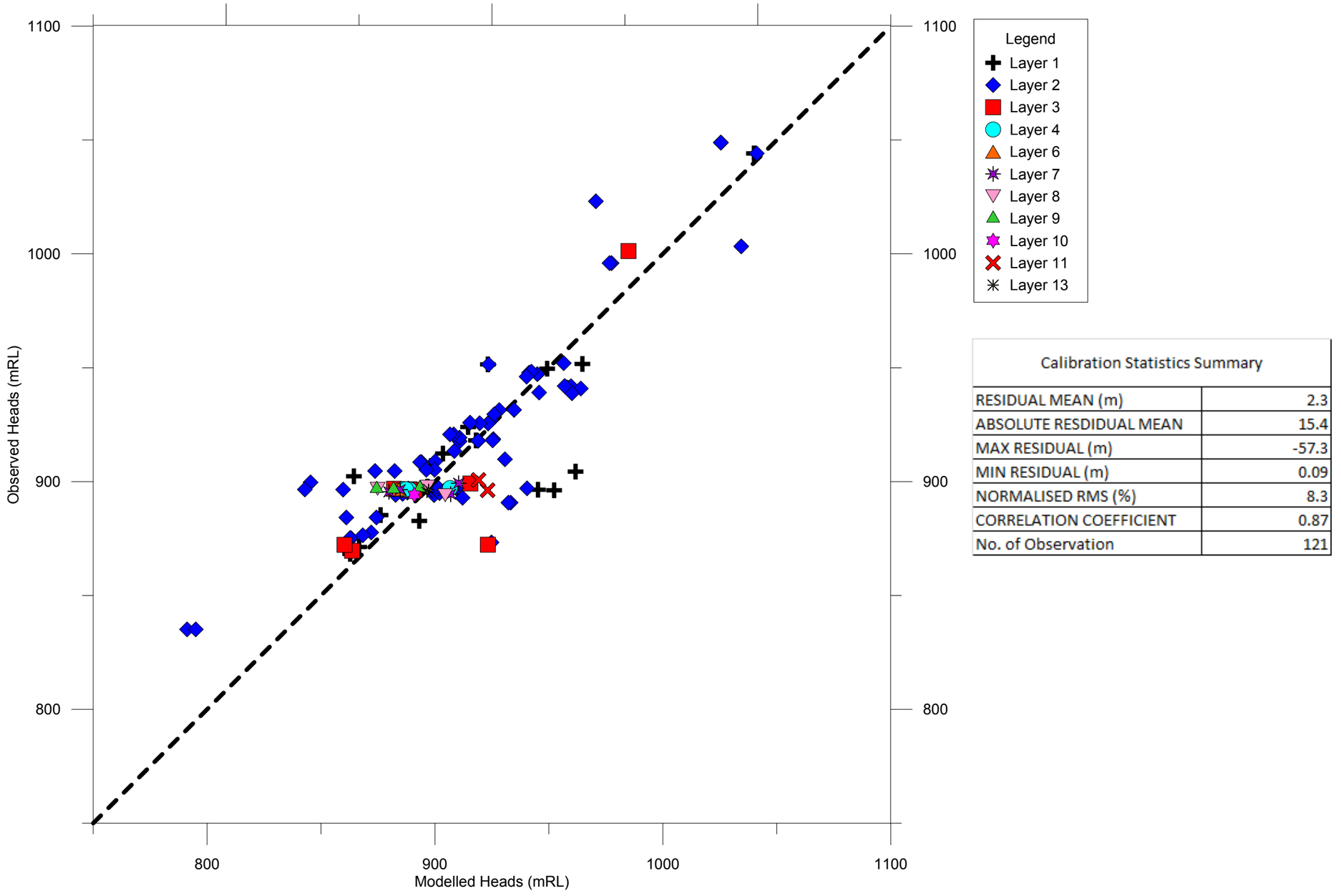
PROJECT
Jacko Lake Hydrogeology Assessment

TITLE
STEADY STATE CALIBRATED GROUNDWATER HEADS

PROJECT No. M0971A01

FIG No. 12

\\int.klohn.com\ProjData\DBN\Vancouver Projects\M09971A01 Ajax\400 Drawings\ArcGIS\Figure X Steady State Hydraulic Head Distribution.mxd



Calibration Statistics Summary	
RESIDUAL MEAN (m)	2.3
ABSOLUTE RESDIDUAL MEAN	15.4
MAX RESIDUAL (m)	-57.3
MIN RESIDUAL (m)	0.09
NORMALISED RMS (%)	8.3
CORRELATION COEFFICIENT	0.87
No. of Observation	121

DRAFT

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CLIENT
KGHM Ajax Mining Inc

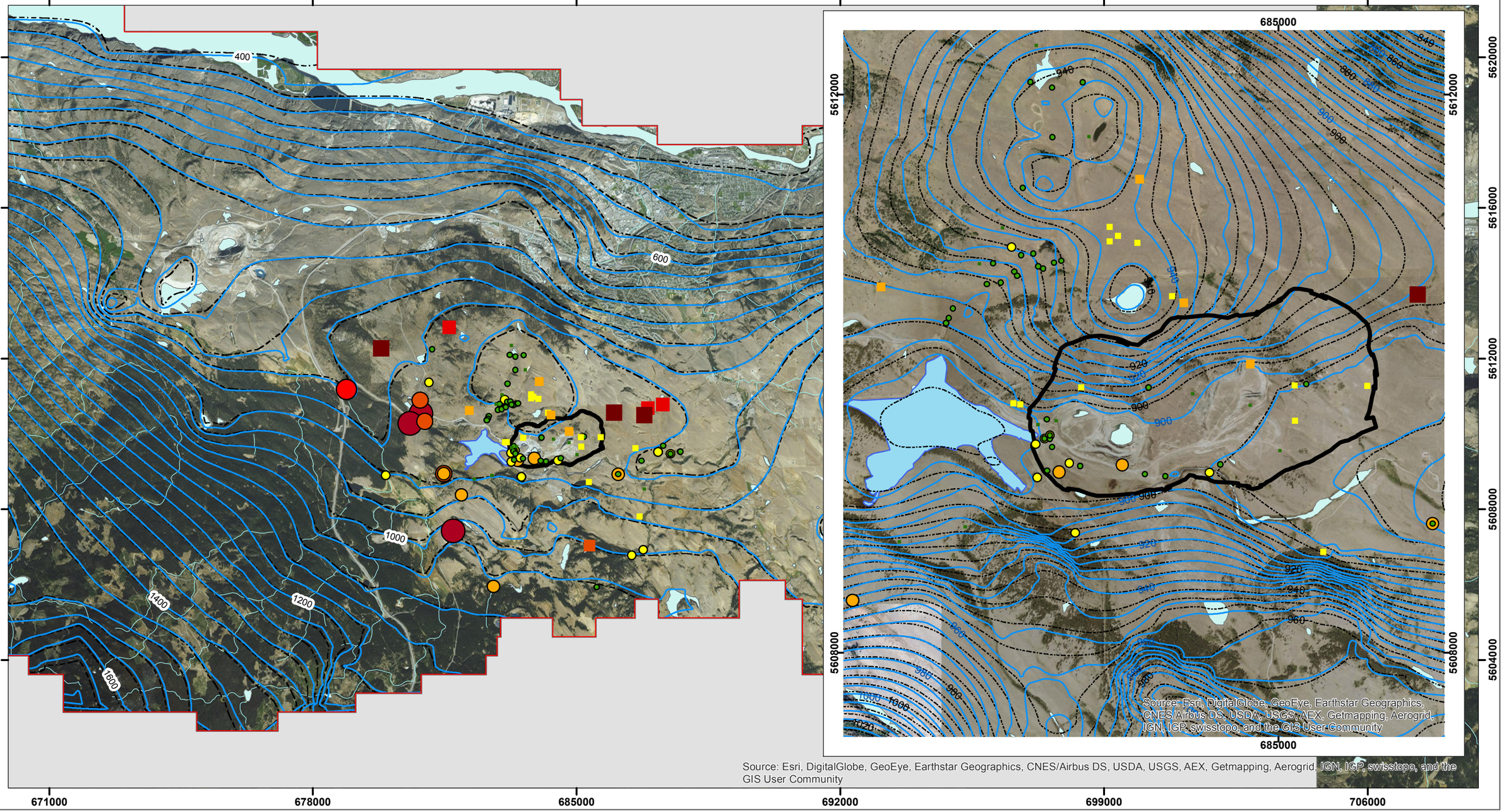
Klohn Crippen Berger

CLIENT
Jacko Lake Hydrogeology Assessment

TITLE
MODEL STEADY STATE
CALIBRATION OBS VS MODELLED VALUES

PROJECT NO. M09871A01

FIGURE NO. FIGURE 13



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Legend

SS Residual -	SS Residual +
-60.0 - -50.0	0.0 - 10.0
-50.0 - -40.0	10.0 - 20.0
-40.0 - -30.0	20.0 - 30.0
-30.0 - -20.0	30.0 - 40.0
-20.0 - -10.0	40.0 - 50.0
-10 - 0.0	50.0 - 60.0

- Proposed Ajax Pit
- Numerical Model Boundary
- Inactive Cells
- NRCAN Watercourse
- Layer 2 SS Calibrated Groundwater Heads
- Layer 4 SS Calibrated Groundwater Heads

NOTES:
1. Projection: North America UTM Zone10N
2.Topographic contours are in metres above sea level (masl).

NOT FOR CONSTRUCTION | DRAFT

1:100,000

0 0.5 1 2 3 4 5 Kilometers

N

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CLIENT
KGHM Ajax Mining Inc

Klohn Crippen Berger

PROJECT
Jacko Lake Hydrogeology Assessment

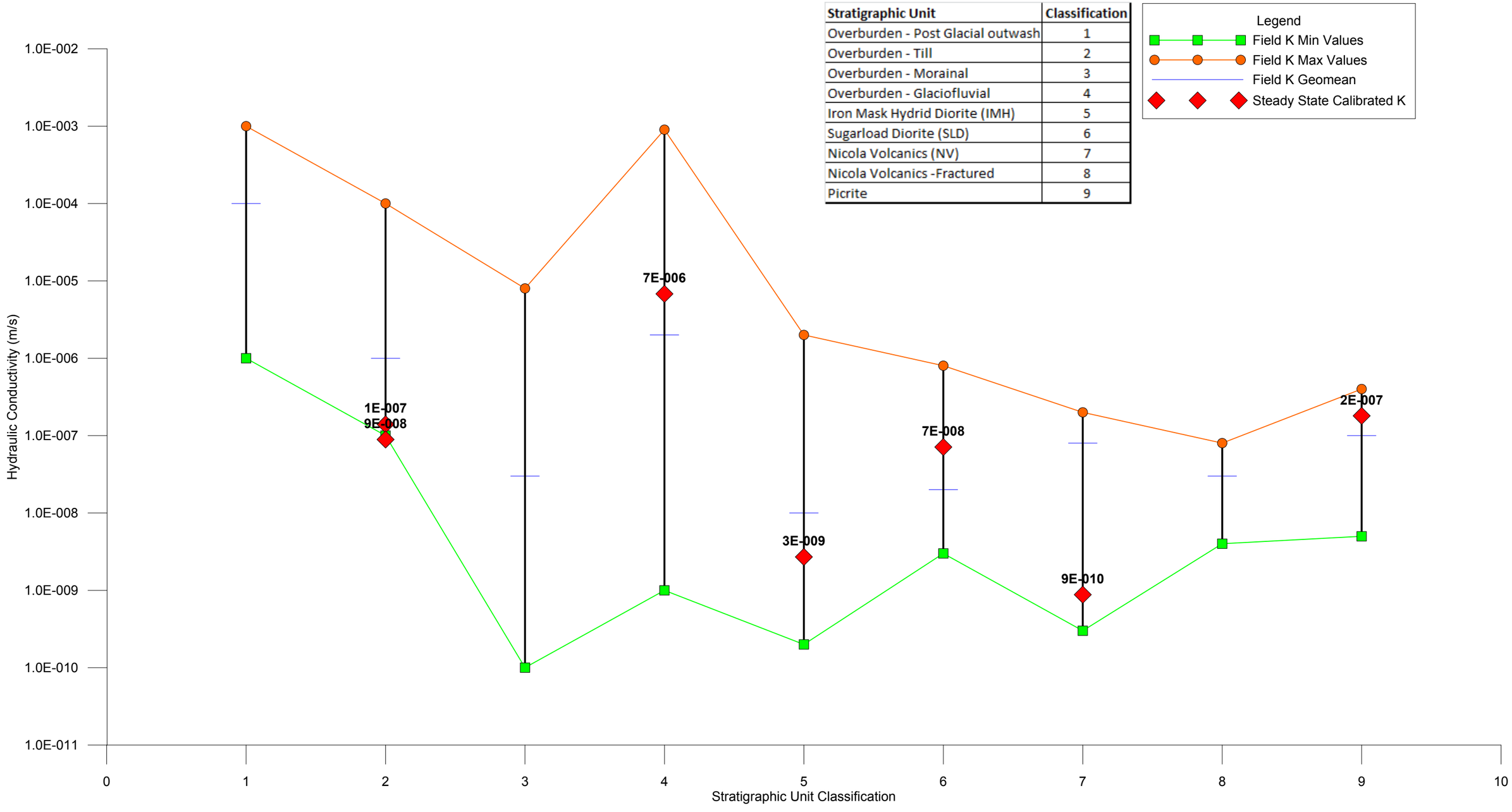
TITLE
STEADY STATE CALIBRATED GROUNDWATER HEADS RESIDUALS

PROJECT No. M0971A01

FIG No. 14

\\int.klohn.com\ProjData\DBN\Vancouver Projects\M09971A01 Ajax\400 Drawings\ArcGIS\Figure X Steady State Residual Heads Distribution.mxd

Stratigraphic Unit	Classification
Overburden - Post Glacial outwash	1
Overburden - Till	2
Overburden - Morainal	3
Overburden - Glaciofluvial	4
Iron Mask Hydrid Diorite (IMH)	5
Sugarload Diorite (SLD)	6
Nicola Volcanics (NV)	7
Nicola Volcanics -Fractured	8
Picrite	9



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CLIENT: KGHM Ajax Mining Inc

Klohn Crippen Berger

CLIENT: Jacko Lake Hydrogeology Assessment

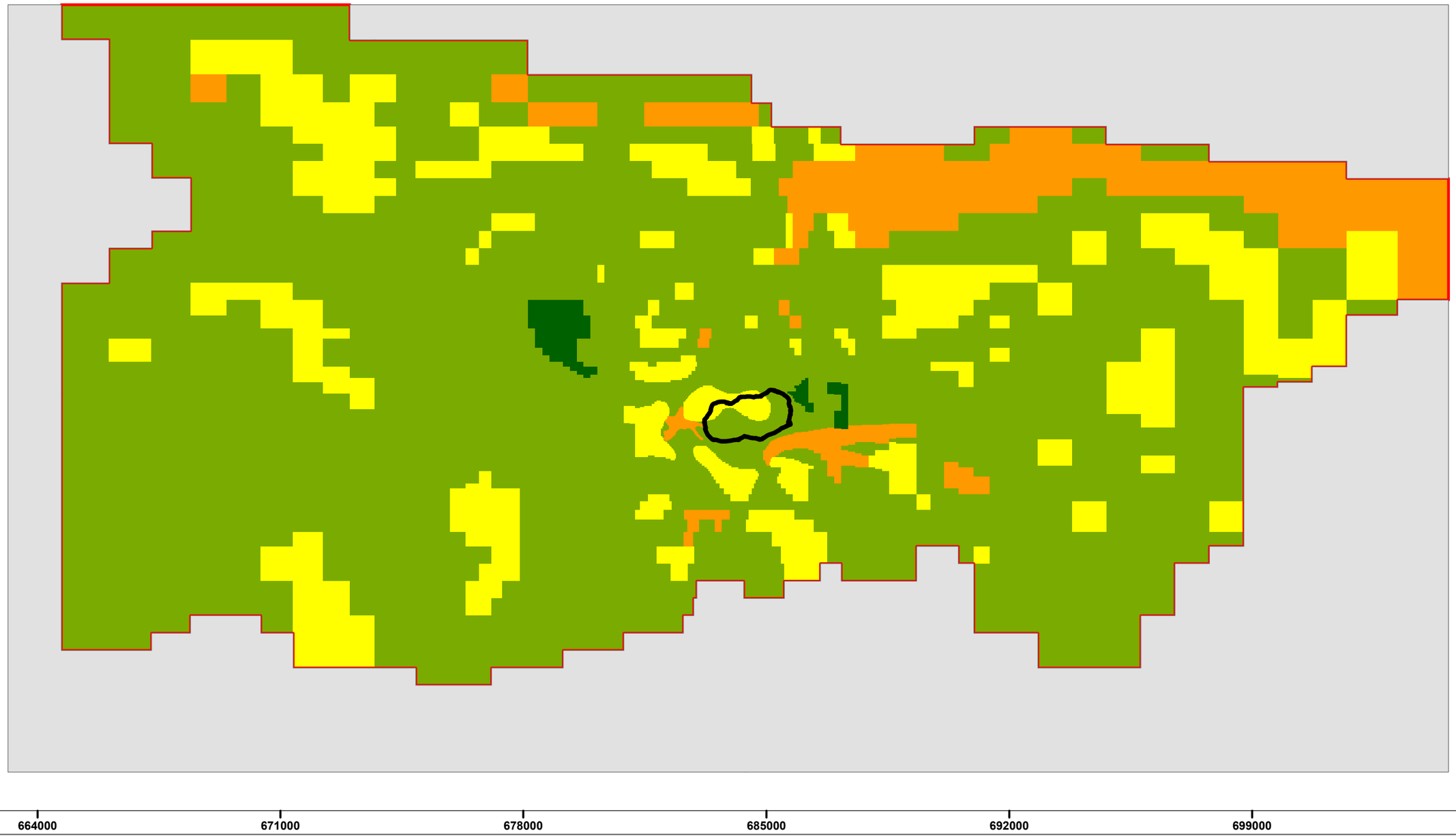
TITLE: MODEL STEADY STATE CALIBRATED K AND FIELD K

PROJECT NO. M09871A01

FIGURE NO. FIGURE 15

664000 671000 678000 685000 692000 699000 706000

5620000 5616000 5612000 5608000 5604000 5600000



Legend

- Proposed Ajax Pit
- Numerical Model Boundary
- Inactive Cells

Hydraulic Conductivity

- Till - Layer 1 = 1.4e-7 m/s / Layer 2 = 8.9e-8 m/s
- Bedrock Outcrop - Layer 1 = 4.1e-7 m/s / Layer 2 = 1e-8 m/s
- Lacustrine - Layer 1 = 6.8e-6 m/s / Layer 2 = 1.4e-7 m/s
- Additional Units - Layer 1 and Layer 2 = 3e-8 m/s

NOTES:
1. Projection: North America UTM Zone10N
2.Topographic contours are in metres above sea level (masl).

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0 1:117,239 5Kilometers

N

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CLIENT: KGHM Ajax Mining Inc

Klohn Crippen Berger

PROJECT: Jacko Lake Hydrogeology Assessment

TITLE: OVERBURDEN CALIBRATED HYDRAULIC CONDUCTIVITY DISTRIBUTION

PROJECT No. M0971A01

FIG No. 16

\\int.klohn.com\Proj\Data\DBNE\Vancouver Projects\M09871A01 Ajax\400 Drawings\ArcGIS\Figure X Overburden Hydraulic Conductivity.mxd

671000 678000 685000 692000 699000

5620000 5616000 5612000 5608000 5604000

Legend

- Proposed Ajax Pit
- Numerical Model Boundary
- Inactive Cells

Hydraulic Conductivity

- Nicola Volcanic / Volcanics - 8.8e-10 m/s
- Regional Sediments - 1e-9 m/s
- IMH - 2.7e-9 m/s
- Regional Intrusives - 3.4e-9 m/s
- SLD - 7.1e-8 m/s
- Regional Metamorphics - 7.5e-8 m/s
- Regional Ultramafics - 1e-7 m/s
- Picrite - 1.8e-7 m/s

NOTES:
1. Projection: North America UTM Zone10N
2.Topographic contours are in metres above sea level (masl).

N

NOT FOR CONSTRUCTION | DRAFT

0 1:100,000 5Kilometers

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CLIENT
KGHM Ajax Mining Inc

Klohn Crippen Berger

PROJECT
Jacko Lake Hydrogeology Assessment

TITLE
BEDROCK CALIBRATED HYDRAULIC CONDUCTIVITY DISTRIBUTION

PROJECT No. M0971A01

FIG No. 17

\\int.klohn.com\ProjData\DBNE\Vancouver Projects\M09871A01 Ajax\400 Drawings\ArcGIS\Figure X Bedrock Hydraulic Conductivity.mxd

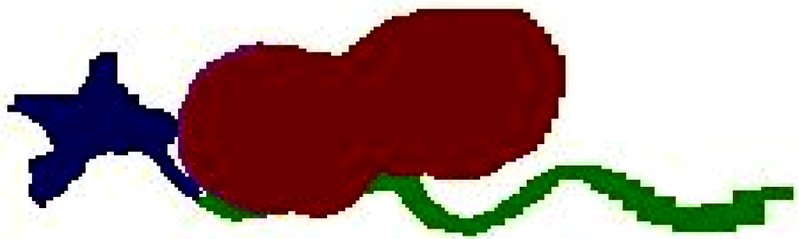
Model Layer 1

Model Layer 2

685000

5612000

5608000



Legend

Zone budgets

- Ajax Open Pit
- Jacko Lake Bed Sediments
- Peterson Ck
- Till Sediment beneath Jacko Lake
- West End of Pit

NOTES:
1. Projection: North America UTM Zone10N
2.Topographic contours are in metres above sea level (masl).

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CLIENT: KGHM Ajax Mining Inc

Klohn Crippen Berger

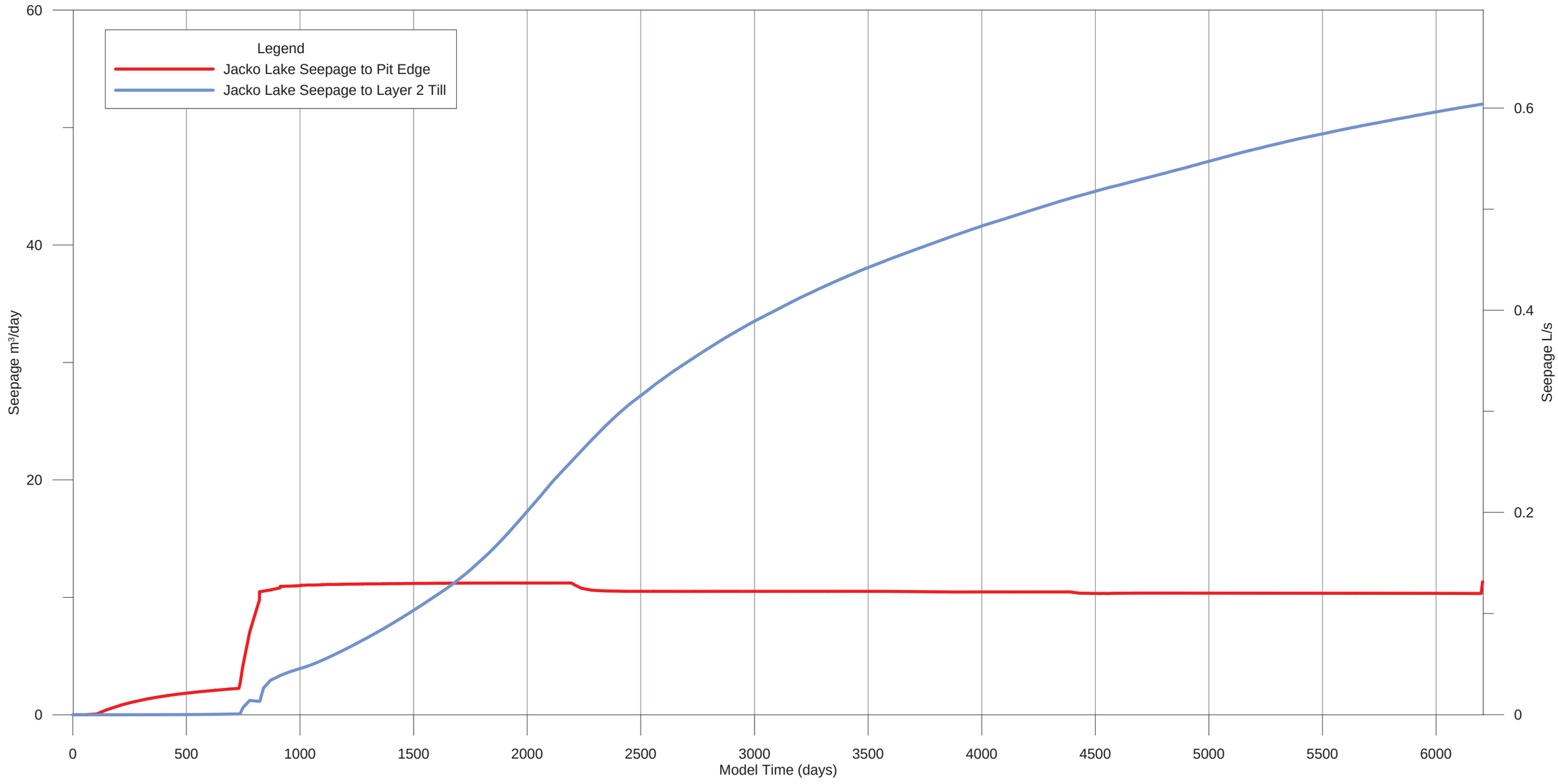
PROJECT: Jacko Lake Hydrogeology Assessment

TITLE: Groundwater Model Zone Budgets

PROJECT No. M0971A01

FIG No. 18

\\int.klohn.com\Proj\Data\DBNE\Vancouver Projects\M09871A01 Ajax400 Drawings\ArcGIS\Figure X Zone Budget Distribution.mxd



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CLIENT
KGHM Ajax Mining Inc

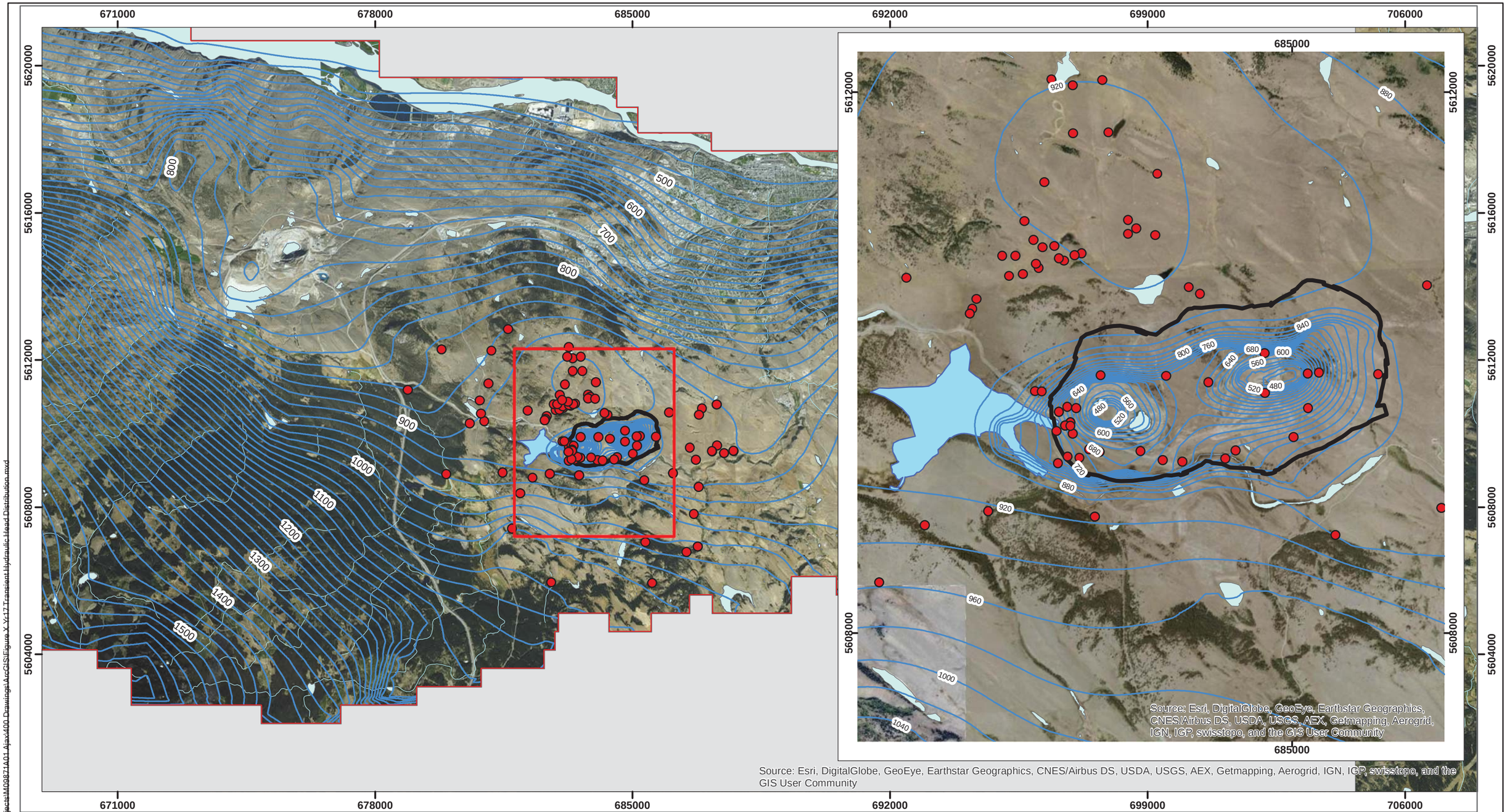
Klohn Crippen Berger

CLIENT
Jacko Lake Hydrogeology Assessment

TITLE
Jacko Lake Bed Seepage Fluxes

PROJECT NO. M09871A01

FIGURE NO. Figure 19



Legend

- Model Observation Wells
- Proposed Ajax Pit
- Numerical Model Boundary
- Inactive Cells
- Year 17 Simulated Groundwater Heads
- NRCAN Watercourse

NOTES:
1. Projection: North America UTM Zone10N
2.Topographic contours are in metres above sea level (masl).

NOT FOR CONSTRUCTION | DRAFT

0 1:100,000 5Kilometers

N

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CLIENT
KGHM Ajax Mining Inc

Klohn Crippen Berger

PROJECT
Jacko Lake Hydrogeology Assessment

TITLE
TRANSIENT SIMULATED YEAR 17 GROUNDWATER HEADS

PROJECT No. M0971A01

FIG No. 20

\\int.klohn.com\Proj Data\DENE\Vancouver Projects\M0971A01 Ajax\400 Drawings\ArcGIS\Figure X Yr17 Transient Hydraulic Head Distribution.mxd

682,000 682,500 683,000 683,500 684,000

N

5,610,000

5,609,500

5,609,000

Jacko Lake

CLAYEY GRAVEL 0.8m
CLAYEY GRAVEL 0.8m
SILTY GRAVELLY CLAY 0.8m
CLAYEY GRAVEL 0.8m
KCB14-HA1

GRAVELLY SILTY CLAY 0.5m
GRAVELLY SILTY CLAY 0.5m
GRAVELLY SILTY CLAY 0.5m
KCB14-HA3

GRAVELLY SILTY CLAY 0.4m
KCB14-HA5

GRAVELLY CLAY 0.6m
GRAVELLY CLAY 0.6m
KCB14-HA7

GRAVELLY SANDY CLAY 0.7m
GRAVELLY SANDY CLAY 0.7m
KCB14-HA8

Inset
0 25m

SAND, MINOR GRAVEL 1.5m
TP-8B

GRAVELLY CLAY 1.2m
GRAVELLY CLAY 1.2m
KCB14-TP2

Jacko Lake

See Inset

SILT-SAND-CLAY 2.3m
SILT-SAND-CLAY 10.5m

West Pit

SILT-SAND- GRAVEL 6.5m
SILT 16.8m
R88-1

SILTY SAND 14.0m
SILTY SAND 14.0m
R88-2
KAX-14-128S

SAND AND GRAVEL 26.5m
KAX-14-114S

SILT-SAND- GRAVEL 1.5m
SILT-SAND- GRAVEL 4.6m
SILT-SAND- GRAVEL 10.7m
SILTY SAND 14.0m
R88-4

SILT AND GRAVEL 16.0m
AJGW02-S

SILT-SAND 1.5m
TP-3

SILT-SAND- GRAVEL 1.5m
TP-5

SILT-SAND- GRAVEL 1.5m
TP-11

SAND, SOME SILT 12.1m
BGC14-002S

SILT 10.5m
SILTY GRAVEL AND SAND 18.3m
BGC14-003I
BGC14-003S,

Note: TP14-377 (3E-08) not shown on this map

LEGEND

- BGC Borehole
- KCB 2014 Test Pit
- KCB Drillhole
- KCB Hand Auger
- KLCB Test Hole (1988)
- KLCB Test Pit (1988)
- KP Test Pit
- KP Monitoring Borehole
- Proposed Pit Extent
- Existing Pit Boundary

HYDRAULIC CONDUCTIVITY RANGE (m/S)

1-4 E-05	1-4 E-07
5-9 E-05	5-9 E-07
1-4 E-06	1-4 E-08
5-9 E-06	5-9 E-08

- Index Contour (20m)
- Intermediate Contour (5m)
- Lakes/Water Bodies
- Drainage Lines

Notes:
1. UTM Zone 10N, NAD83
2. Map data sources are provided by KGHM International
3. Proposed pit provided by KGHM May 2014
4. Guelph permeameter test depths are base of auger hole
5. Slug test depths are midpoint of screen

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CLIENT
KGHM INTERNATIONAL AJAX PROJECT

Klohn Crippen Berger

PROJECT
AJAX MINE
JACKO LAKE HYDROGEOLOGY ASSESSMENT

TITLE
OVERBURDEN HYDRAULIC CONDUCTIVITY

PROJECT No. M09871A01

FIG No. 21

Date: 2 JUN 2015 M09871A01 KGHM Ajax Project Gold\400 Drawings\GIS\mxd\Jacko Lake Hydrogeology Assessment\2015\06\25\Overburden Hydraulic Conductivity.mxd

682,000 682,500 683,000 683,500 684,000

5,610,000 5,609,500 5,609,000

N

Jacko Lake

West Pit

PICR 21.2m
PICR 42.7m
SLD 47m
SLD 69.1m
NV 109.5m
PICR/NV 114.8m
NV/SLD 120.3m
SLD/PICR 127.6m
NV/SLD/PICR 130.6m
SLD/PICR/NV 146.2m

IMH/SLD 97m
SLD 121m
IMH 159m
IMH 187m
IMH 200m
IMH 273m
IMH 298m
IMH 321m

IMH 92m
IMH 142m
IMH 240m
IMH 298m
IMH 362m

IMH 64m
IMH 134m
SLD 233m
IMH 360m

AW-10-106
AW10-118
AW-10-105

KAX-14-121

NV 73m
PICR 123m
SLD 173m

NV 75m
SLD 125m
SLD 175m

BGC10-MWA
BGC10-MWB
BGC10-PW01

PICR 107.5m
PICR 108m

57m
R88-1
R88-2
37m
KAX-14-124
KAX-14-128

NV/PICR 42.5
PICR/NV 52.5m
PICR 73m
PICR 88.5m
PICR 106.7m
PICR 124.9m
PICR 140.4m

KAX-14-108

PICR 38.4m
PICR 47.4m
PICR 61.7m
PICR 73.7m
PICR 77.4m
PICR 94.7m
PICR/NV 126.2m

NV 73.5m
PICR/NV 102.7m
PICR/NV 121.1m
PICR/NV/SLD 151.7m
SLD 165.5m

NV 74m
PICR 128m
PICR 201m
PICR 286m

AW-09-103

SLD 63m
SLD 143m
NV 220m

AW-09-104

PICR 44m
PICR 48.9m
PICR 55.8m
PICR/NV 70.7m
PICR 82m
PICR 97.9m

KAX-14-130
KAX-14-114
KAX-14-107

PICR 59m
PICR 71m
NV 105m
NV 109.2m

PICR/NV 40.7m
NV 60.3m
PICR 73.5m
PICR 77.4m
NV 96.2m
NV 123.9m
NV 153.9m
NV 164.3m
NV 207.9m

BGC14-002D
NV 19.8m

BGC14-003D
NV 29.9m

BGC14-001D
NV 21m

LEGEND

- BGC Borehole
- BGC Piezometer
- KCB Drill Hole
- KLCB Test Pit (1988)
- Proposed Pit Extent
- Existing Pit Boundary

BEDROCK CONDUCTIVITY RANGE (m/s)

1-4 E-05	1-4 E-07	1-4 E-09
5-9 E-05	5-9 E-07	5-9 E-09
1-4 E-06	1-4 E-08	1-4 E-10
5-9 E-06	5-9 E-08	5-9 E-10

- Index Contour (20m)
- Intermediate Contour (5m)
- Lakes/water bodies
- Drainage lines

BEDROCK GEOLOGICAL UNITS

PICR Picrite
NV Nicola Volcanics
SLD Sugarloaf Diorite
IMH Iron Mask Hybrid

Notes:
1. UTM Zone 10N, NAD83
2. Map data sources are provided by KGHM International
3. Proposed pit provided by KGHM May 2014
4. Test depths are screen or test interval midpoints

NOT FOR CONSTRUCTION

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CLIENT KGHM INTERNATIONAL AJAX PROJECT

Klohn Crippen Berger

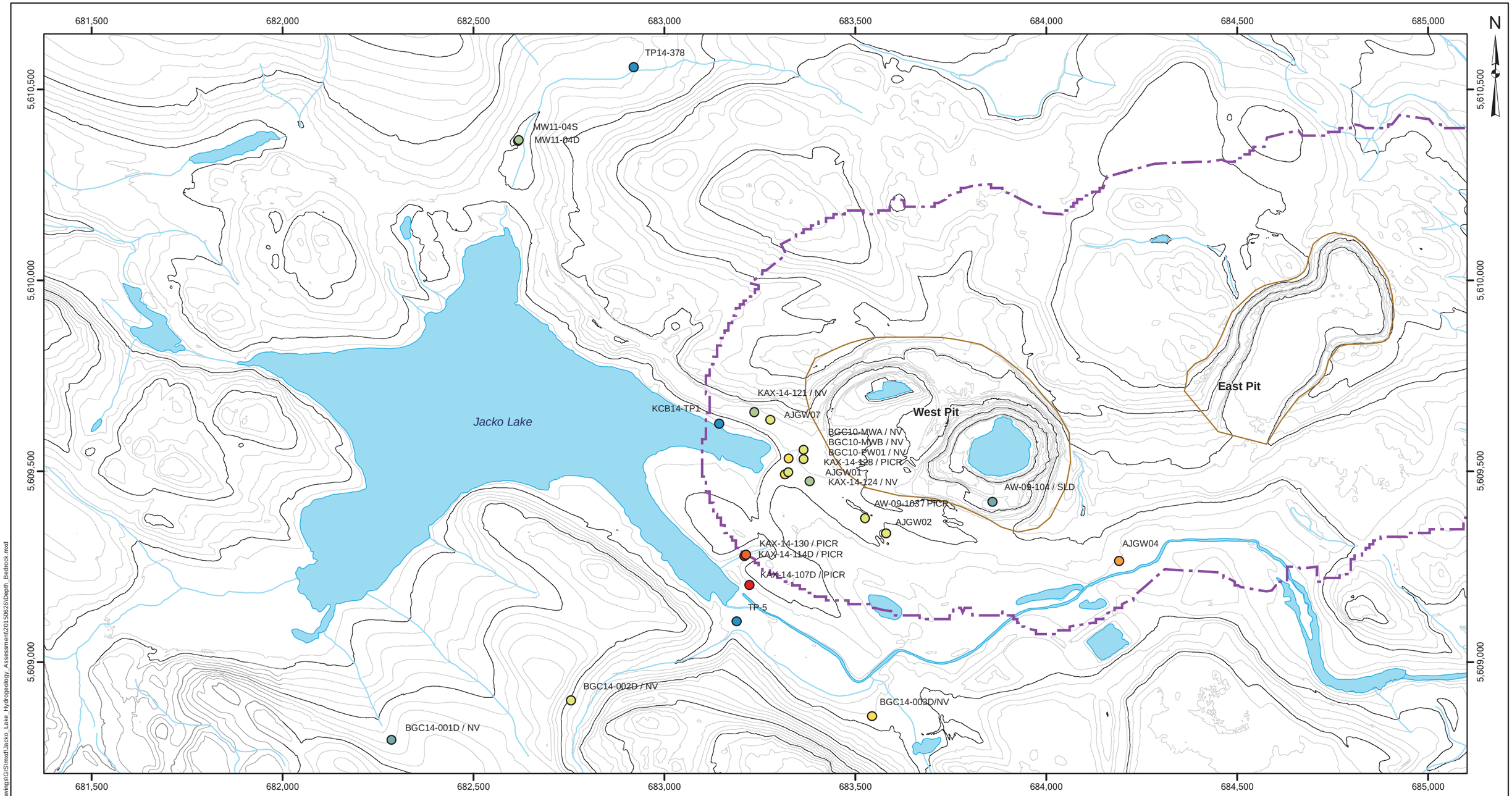
PROJECT
AJAX MINE
JACKO LAKE HYDROGEOLOGY ASSESSMENT

TITLE
BEDROCK HYDRAULIC CONDUCTIVITY

PROJECT No. M09871A01

FIG No. 22

Path: Z:\MV\CRM\09871A01-KGHM-Ajax Copper Gold\400 Drawings\GIS\mxd\Jacko_Lake_Hydrogeology_Assessment\20150626\Bedrock_Hydraulic_Conductivity.mxd



BEDROCK GEOLOGICAL UNITS

PICR	Picrite
NV	Nicola Volcanics
SLD	Sugarloaf Diorite
IMH	Iron Mask Hybrid

LEGEND

Depth to Bedrock (m)

- 0 - 5
- 5 - 10
- 10 - 15
- 15 - 20
- 20 - 25
- 25 - 30
- 30 - 35
- 35 - 40

- Proposed Pit Extent
- Existing Pit Boundary
- Index Contour (20m)
- Intermediate Contour (5m)
- Lakes/water bodies
- Drainage lines

Notes:
1. UTM Zone 10N, NAD83
2. Map data sources are provided by KGHM International
3. Proposed pit provided by KGHM May 2014
4. Test depths are screen or test interval midpoints

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CLIENT: KGHM INTERNATIONAL AJAX PROJECT

Klohn Crippen Berger

PROJECT: AJAX MINE
JACKO LAKE HYDROGEOLOGY ASSESSMENT

TITLE: DEPTH TO BEDROCK

PROJECT No. M09871A01

FIG No. 23

Path: Z:\MV\CR\M09871A01-KGHM-Ajax Copper Gold\400 Drawings\GIS\mxd\Jacko_Lake_Hydrogeology_Assessment\20150626\Depth_Bedrock.mxd

APPENDIX I

Jacko Lake Hydrogeology Assessment: Site Investigation Report

Klohn Crippen Berger

KGHM International

Ajax Mine - Jacko Lake Hydrogeology Assessment

Site Investigation Report

CANADA'S BEST MANAGED COMPANIES Platinum member

ISO 9001
ISO 14001
OHSAS 18001

M09871A01.730

March 2015

Klohn Crippen Berger

March 20, 2015

KGHM International
Suite 200 – 124 Seymour Street
Kamloops, British Columbia
V2C 2E1

Nettie Johnston
Senior Permitting Specialist

Dear Ms. Johnston:

Ajax Mine - Jacko Lake Hydrogeology Assessment
Site Investigation Report

Please find enclosed our Site Investigation report covering the drilling portions of the hydrogeological field investigation undertaken to assess the potential for a hydraulic connection between Jacko Lake and the proposed pit extents.

Yours truly,
KLOHN CRIPPEN BERGER LTD.

Harvey McLeod, P.Eng.
Principal

MAB:jcp

150320R-Site Investigation Report.docx
M09871A01.730

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Ajax Mine - Jacko Lake Hydrogeology Assessment

Site Investigation Report

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1 INTRODUCTION

Klohn Crippen Berger Ltd. (KCB) was commissioned by KGHM International Ltd. (KGHM) to undertake a hydrogeological assessment in the vicinity of Jacko Lake for the Ajax Copper Gold Project, near Kamloops BC. This assessment includes a a site investigation to characterize the local hydrogeology, evaluate the mechanisms and pathways for potential hydraulic connectivity between Jacko Lake and the proposed open pit, and to provide data for the design of a dyke near the North Arm of Jacko Lake. This site investigation report summarizes the drilling and testing program undertaken between February 28, 2014 and May 7, 2014 to address data gaps identified in the Preliminary Hydrogeological Conceptualization (KCB, 2013). Non-drilling site investigation activities have not yet commenced and will be summarized under separate cover.

1.1 Background

As part of the Environmental Assessment (EA) for the Ajax Project, local stakeholders have expressed an interest in understanding whether the proposed Ajax West Pit expansion may impact water levels in Jacko Lake. Hydrogeological assessments and monitoring programs have been undertaken at the Ajax property since 1988, and indicate that connectivity between Jacko Lake and the existing West Pit is likely negligible, based on the following:

- Resistivity surveys immediately east of the lake indicate the overburden has a low resistivity; when considered with drilling results the till was identified to be thin, discontinuous, dry and dense. Based on these data it was considered unlikely that the till represented a seepage migration pathway.
- Test pitting in the northeastern arm of Jacko Lake (prior to the lake level being raised) encountered clayey silt lake bed sediments overlying till. This likely forms a low hydraulic conductivity barrier beneath the entire lake.
- Boundary condition effects from Jacko Lake were not observed during a constant rate pumping test from a prototype dewatering well near the lake.
- Bedrock encountered during geotechnical and exploration drilling, and the opening of the existing pit encountered “tight” bedrock, with no obvious “aquifers”.
- No changes in lake levels were observed during previous mining activities at the Ajax site.

The KCB hydrogeological study is being undertaken specifically to assess connectivity between the lake and the proposed pit. This program includes additional site investigation to improve sub-surface characterization between the lake and the pit, and increase the volume of hydrogeological data.

To address local Stakeholder inputs, including the Stk’emlupsemc te Secwepemc Nation (SSN), no mechanized investigations were performed within or under the wetted perimeter of Jacko Lake as part of the current program. Notice of Work (NOW) applications for the program were submitted to BCMEM by KGHM in summer 2013, and approved in January 2014.

The current program comprised vertical and inclined diamond drilling, in-situ hydrogeological testing, and the installation of monitoring wells and downhole instrumentation. A test pitting and hand augering program is also proposed to characterize the shallow overburden in the vicinity of Jacko Lake. These activities are currently being planned.

1.2 Site Investigation Objectives

Following a review of the historical site data, KCB revised the conceptual hydrogeological model for the area in the vicinity of Jacko Lake and completed a gap analysis. In addition to improving the overall understanding of the distribution and hydrogeological characteristics of the overburden and bedrock units, the site investigation program was developed to address the gaps identified in the data review as follows:

- characterize the hydraulic conductivity of:
  - inferred faults and fracture networks;
  - potential “void” structures; and
  - geological unit contacts.
- characterize the picrite unit; and
- assess the thickness and properties of the lake bed sediments.

2 FIELD PROGRAM IMPLEMENTATION

The field program started at KAX-14-107 on February 28th and finished with the completion of KAX-14-130 on May 6, 2014. KCB personnel remained on site until May 7, 2014 to oversee development of well KAX-14-121. The field program experienced delays associated with weather and slower than anticipated drilling rates.

The program was generally carried out as described in the Site Investigation Work Plan – Rev A (KCB, 2014). The proposed drilling program, including the purpose of each drilling location are shown in Table 2.1. Modifications to the program made during the site investigation are described in Table 2.2.

Each of the proposed drillholes intersected their respective target zones, lithological units, and/or structural features.

Table 2.1 Proposed Drilling Program

Hole ID	Easting/ Northing	Purpose of Investigation	Technical Specifications
KCB13-01	683150/ 5609685	▪ Evaluate spatial variability in overburden/bedrock geology and potential hydraulic connectivity between Jacko Lake and proposed Ajax pit wall.	▪ Single vertical hole into bedrock. ▪ South of cliff face (adjacent to road) and outside pipeline right of way. ▪ 70m from lakeshore on surface.
KCB13-02 (A/B)	683315/ 5609490	▪ Evaluate spatial variability in overburden/bedrock geology and potential hydraulic connectivity between Jacko Lake and proposed pit. ▪ Assess continuity of bedrock "void" at KAX-13-005. Zone of apparent lower Rock Quality Designation (RQD).	Two holes proposed: ▪ HOLE A: Inclined bedrock drill hole oriented towards the lake. ▪ HOLE B: Vertical drill hole into bedrock.
KCB13-03	683140/ 5609430	▪ Evaluate spatial variability in overburden/bedrock geology and potential hydraulic connectivity with lake.	▪ Single vertical hole into bedrock; outside pipeline right of way. ▪ 105m from nearest (north) lakeshore, new disturbance.
KCB13-04 (A/B)	683210/ 5609280	▪ Intersect NE-SW striking (SE dipping) fault, and assess overburden characteristics.	Two holes proposed: ▪ HOLE A: Inclined bedrock drill hole oriented towards the lake. ▪ HOLE B: Vertical drill hole into bedrock. ▪ 80m from lakeshore, new disturbance.
KCB13-05	683225/ 5609200	▪ Assess overburden characteristics and potential preferential groundwater flow in apparent trough in bedrock surface. Assess characteristics of "intact" bedrock.	▪ Single vertical hole into bedrock; outside of KMP right-of-way. ▪ 25m from lakeshore on existing road / disturbance.

Table 2.2 Modifications to Site Investigation

Item	Change from Work Plan	Reason
KAX-14-107 (KCB13-05)	Reduced target depth from 150 m to 128 m based on competent rock observations.	Competent rock observations.
KAX-14-121 (KCB13-01)	Changed inclination from 90 to 70 degrees with azimuth of 210 degrees.	Relocation of drillhole location due to access issues meant that vertical drillhole would not intersect target zone.
KAX-14-124 (KCB13-02A)	Extended target depth from 200 m to 250 m.	KGHM request.
KAX-14-128 (KCB13-02B)	Extended target depth from 150 m to 200 m.	KGHM request.
Nested Monitoring Wells	Shallow monitoring wells were installed in separate drill holes offset ~5 m from the deep well, rather than being nested in the same hole.	Difficulties installing nested wells necessitated change.
Vertical Hole Size	Vertical hole diameter was reduced from PQ to HQ part-way through the program.	Improve drilling production.
Overburden Drill Method	Overburden drill method for the vertical holes was changed from PQ3 coring to ODEX part-way through the program.	Improve drilling production.
Additional Drill Rig	An A5 diamond drill rig was mobilized to drill the inclined holes.	Improve drilling production.

3 SITE INVESTIGATION

3.1 Overview

The field program completed to date has comprised the following:

- inspection of representative drill core from previous investigations;
- advancement of 11 drillholes at 5 drill sites:
  - 4 vertical drillholes terminated in overburden;
  - 4 vertical drillholes terminated in bedrock; and
  - 3 inclined drillholes terminated in bedrock.
- geotechnical and geological logging of drill returns (core, cuttings);
- Standard Penetration Testing (SPT) at 1.5 m intervals in the overburden at each drill site;
- Air Lift Yield tests in the overburden and bedrock at each drill site;
- single and straddle packer testing in the bedrock in each drillhole;
- installation of instrumentation:
  - vertical drillholes completed with standpipe piezometers;
  - drillhole KAX-14-121 completed with a standpipe piezometer; and
  - drillholes KAX-14-124 and KAX-14-130 completed with 2 Vibrating Wire Piezometers (VWPs) per drillhole.
- well development; and
- groundwater level monitoring.

3.2 Drilling

3.2.1 Overview

Prior to commencement of the drilling program, KCB personnel inspected representative drill core from previous drilling programs. This was undertaken to familiarize KCB personnel with the geological units that were anticipated to be encountered during drilling.

KCB personnel oversaw drilling activities (drilling and testing) for the duration of the program. Geotech Drilling Services Ltd. was retained by KGHM as the drilling contractor for the project. KGHM personnel prepared the drill pads and confirmed the rig orientation for the inclined drillholes.

Drilling was initially scheduled for 24 hours a day, 7 days a week in two 12 hour shifts with a single Fraste MDXL drill rig. To improve production, an additional drill rig (2011 A5) was mobilized on April 7, 2014 to complete the inclined drillholes. Upon addition of the A5 rig, the average drilling rate was approximately 30 metres per day.

All drilling returns for the inclined and deep vertical drillholes were logged geotechnically and geologically by KCB personnel, with confirmatory geological logging performed by KGHM following completion of the drilling program. Logging was generally undertaken while core was in the splits to minimize mechanical damage.

Drillhole details are shown in Table 3.1. Drillhole logs are provided in Appendix I and photographs are provided in Appendix II. Drillhole locations are shown on Figure 1.

A Reflex tool was used to confirm the inclination of inclined boreholes during bedrock drilling (specifically, to make sure the hole did not deviate beneath Jacko Lake). A summary of the final measurements is provided in Table 3.3.

Where necessary, DR-133 polymer was used to improve coring. All holes were flushed with clean water prior to packer testing.

3.2.2 Fraste MDXL Rig (vertical drillholes)

Overburden drilling in vertical holes with the Fraste MDXL was initially undertaken using PQ3 triple tube diamond drilling techniques (hole diameter 122.6 mm). PWT casing was advanced behind the drill bit to provide stability for the open hole until bedrock was encountered. The following modifications were made to the Fraste rig drilling plan on March 29, 2014 to improve production:

- overburden drilling method changed to ODEX;
- reduction of bedrock coring diameter from PQ3 to HQ3 (hole diameter 96 mm);
- installation of a single stand-pipe piezometer per drillhole due to reduced hole diameter; and
- addition of shallow offset vertical drillholes for the overburden well installation.

3.2.3 A5 Rig (inclined drillholes)

Overburden drilling with the A5 rig was undertaken using triple tube HQ3 coring techniques. HW casing was advanced behind the drill bit to provide stability for the open hole until bedrock was encountered. Bedrock drilling with the A5 was undertaken using triple tube HQ3 coring techniques.

Drill core was oriented using a Reflex ACT II tool. Geotech personnel marked all drill returns with an orientation mark upon removal of the core, and KCB personnel measured alpha and beta angles for defects. Where drill core was unable to be oriented (e.g. due to highly broken intervals or equipment issues), angle measurements were not recorded.

Table 3.1 Drillhole Details

Drillhole ID		Easting/ Northing	Drill Rig	Drillhole Diameter (mm)	Date Completed	Drilled Length (m)	Depth to Bedrock	Testing[1]	Well Installation Details		
KGHM ID	Original ID								Instrument	Stick-up (mags)[2]	Screen Interval (mbgs)[3]
KAX-14-107S	KCB13-05	683224/ 5609202	Fraste	122.6	April 16, 2014	38.5	38.8	SPT, AL, PT	50.8 mm Sched. 80 PVC MW	0.44	29.9 – 38.0
KAX-14-107D					March 10, 2014	128			50.8 mm Sched. 80 PVC MW	1.04	56.7 – 75
KAX-14-108S	KCB13-03	683140/ 5609428	Fraste	122.6	April 4, 2014	36	37.6	SPT, AL, PT	50.8 mm Sched. 80 PVC MW	0.72	32.3 – 35.4
KAX-14-108D					March 22, 2014	148.4			50.8 mm Sched. 80 PVC MW	0.63	71.7 – 90
KAX-14-114S	KCB13-04B	683210/ 5609277	Fraste	122.6	April 11, 2014	33	37.57	SPT, AL, PT	50.8 mm Sched. 80 PVC MW	0.86	22.0 – 31.1
KAX-14-114D				96	April 3, 2014	124			50.8 mm Sched. 80 PVC MW	0.86	104.4 – 122.7
KAX-14-121	KCB13-01	683236/ 5609655	A5	96	April 12, 2014	150.90	9.58 (10.2 along drillhole)	AL, PT	50.8 mm Sched. 80 PVC (pre-pack screen) MW	0	144.1 – 150.2
KAX-14-124 A/B	KCB13-02A	683316/ 5609491	A5	96	April 24, 2014	250	20.67 (22 along drillhole)	Al, PT	VWP x2	0	A: 50.4 B: 190.4
KAX-14-128S	KCB13-02B	683325/ 5609497	Fraste	122.6	April 30, 2014	18	17.8	SPT, AL, PT	50.8 mm Sched. 80 PVC MW	0.53	10.9 – 17.0
KAX-14-128D				96	April 24, 2014	198.8			50.8 mm Sched. 80 PVC MW	0.05	71.7 – 90
KAX-14-130 A/B	KCB13-04A	683214/ 5609281	A5	96	May 7, 2014	225	31.95 (34 along drillhole)	Al, PT	VWP x2	0	A: 175.3 B: 222.3

1: SPT: Standard Penetration Test, AL: Air Lift Yield Test, PT: Packer Test, MW: monitoring well
2: mags: metres above ground surface. Stick-up measurements as recorded prior to KCB demobilization; final stick-up heights may change as well installations and monument casing are completed by Geotech.
3: mbgs: metres below ground surface; tip depth provided for VWP installations (metres along borehole).

Table 3.2 Final Drill Hole Orientation

Drillhole ID	Station Depth (m)[1]	Inclination (°)	Azimuth (°)[2]
KAX-14-121	10	-68.7	199.5
	109	-69.7	199.5
KAX-14-124	136	-69.8	293.6
	196	-70.0	295.1
KAX-14-130	50	-70.2	289.4
	96	-70.4	287.5
	151	-71.3	287.9
	218.5	-71.9	285.3
	226	-72.3	285.0

1: Station depth is the terminal depth of the measurement (i.e., station depth of 10 m provides the inclination and azimuth over the interval 0 – 10 m)
2: Azimuth not corrected for magnetic declination

The final drill hole azimuths and inclinations are in agreement with the planned configurations. None of the drill holes extended beneath Jacko Lake.

3.2.4 Core Logging and Sampling

Drill holes were advanced in 1.5 m runs. The following logging and sampling activities were undertaken during the drilling program:

- soil description including USCS classification, gradation, plasticity, consistency/density, moisture content, colour, structure, foreign materials, and geological interpretation;
- rock description including Total Core Recovery (TCR), Rock Quality Designation (RQD), Solid Core Recovery (SCR), rock type, grain size, weathering, hardness, structure, fracture frequency (# of fractures per 30 cm), fracture and structure orientation, and discontinuity descriptions;
- photographs of drilling returns;
- collection of soil samples for laboratory analyses; and
- rock core placed in core boxes for KGHM for further geological logging, assays, etc., and storage.

Drillhole logs are provided in Appendix III. Defect orientation data for the inclined drillholes was plotted on stereographic projections using Dips (Rocscience, 2012). These stereographic projections aid in illustrating the predominant joint sets within a borehole and are shown in Appendix IV.

3.3 Testing Program

3.3.1 Standard Penetration Tests (SPTs)

Standard Penetration Tests (SPTs) were conducted at 1.5 m intervals through the overburden in vertical drillholes to gather samples and give an indication of soil density with depth. All SPTs were

conducted in accordance with ASTM D1586-11. SPT measurements are provided on the drillhole logs in Appendix I.

3.3.2 Air Lift Yield Testing

Air lift tests were conducted in drill holes to provide qualitative indications of groundwater inflow. Water from the open drillhole was evacuated from the open hole using the rig compressor and the discharge rate monitored (using a “bucket and stopwatch”) until the yield stabilized.

The results of the air lift yield tests were used for packer test interval selection, primarily concentrated at zones of relatively high yield. The air lift test procedure was as follows:

- pull up drill rods or casing to expose test interval of interest;
- attach a stuffing box to the top of the drill rods or casing;
- lower 1” schedule 80 PVC through the stuffing box to the bottom of the hole;
- inject air and monitor the rate of water return.

Air Lift yields are summarized in Table 3.3.

Table 3.3 Air Lift Test Yields

Hole ID	Date	Duration (min)	Hole Depth (at time of testing) (m)	Bit Depth (m)	Casing Depth (m)	Pressure (psi)	Estimated Yield (L/s)	pH	Electrical Conductivity (µS/cm)*	Total Dissolved Solids (ppm)*	Temperature (°C)	Water Level (After Test) (mbg)**
KAX-14-107	4-Mar-14	17	33.5	33.0	25.9	50	1.4	***	***	***	***	4.19
KAX-14-107	5-Mar-14	42	39.8	39.4	35.1	80	0.01	***	***	***	***	-
KAX-14-107	5-Mar-14	22	39.8	39.1	35.1	100	0.03	***	***	***	***	21.15
KAX-14-107	5-Mar-14	31	39.8	38.0	35.1	100	0.1	***	***	***	***	19.40
KAX-14-107	6-Mar-14	21	45.9	41.0	39.6	100	0.03	***	***	***	***	38.40
KAX-14-107	7-Mar-14	16	65.0	54.5	39.6	90	0.01	8.69	1245	882	7.6	54.60
KAX-14-107	9-Mar-14	21	84.5	68.0	39.6	120	0.02	8.68	1213	858	8.6	71.89
KAX-14-108	13-Mar-14	15	17.0	16.8	13.5	60	0.04	8.78	962	684	8.5	-
KAX-14-108	14-Mar-14	28	21.5	18.3	18.3	-	0.05	8.73	972	689	9.4	10.93
KAX-14-108	14-Mar-14	24	26.0	25.5	19.5	70	0.2	8.38	1483	1060	10.9	-
KAX-14-108	15-Mar-14	22	30.5	30.5	24.0	50	0.2	8.33	1322	940	11.1	-
KAX-14-108	15-Mar-14	33	39.5	38.9	24.0	90	0.08	8.52	1752	1250	11.3	-
KAX-14-108	16-Mar-14	20	44.0	39.5	34.3	60	0.2	8.76	1242	881	10.1	-
KAX-14-108	17-Mar-14	20	57.5	45.5	34.5	55	0.1	9.10	1258	892	7.3	-
KAX-14-108	17-Mar-14	30	72.5	59.0	34.5	120	0.1	9.22	1475	1050	8.9	33.83
KAX-14-108	18-Mar-14	24	78.5	68.0	34.5	80	0.02	9.37	1399	992	9	42.27
KAX-14-108	19-Mar-14	28	93.5	82.3	34.5	85	0.1	9.26	1428	1010	9.3	38.50
KAX-14-108	19-Mar-14	15	114.5	104.0	34.5	120	0.1	9.16	1451	1030	9.1	37.88
KAX-14-108	21-Mar-14	21	128.0	120.5	34.5	140	0.06	9.50	1602	1140	6.2	8.38
KAX-14-108	22-Mar-14	25	148.4	131.0	34.5	135	0.05	9.47	1618	1160	5.8	9.80
KAX-14-114	29-Mar-14	15	22.6	21.8	21.8	70	0.01	8.91	1123	800	12.1	-
KAX-14-114	29-Mar-14	16	31.7	25.6	25.6	47	0.5	9.21	1113	787	8.5	-
KAX-14-114	30-Mar-14	15	37.6	31.6	31.6	47	0.7	8.89	1068	756	8.6	-
KAX-14-114	30-Mar-14	19	37.6	33.2	33.2	50	0.7	8.83	1090	774	9	-
KAX-14-114	31-Mar-14	22	74.0	66.5	38.0	50	0.4	9.25	1523	1080	10.5	2.77
KAX-14-114	2-Apr-14	21	110.0	84.5	38.0	50	0.4	8.93	1655	1180	12.2	
KAX-14-121	8-Apr-14	34	27.9	13.2	8.8	60	0.03	6.54	1435	1020	13.7	4.90
KAX-14-121	8-Apr-14	26	48.9	35.1	8.8	100	0.01	8.86	1654	1160	17.2	>16****
KAX-14-121	9-Apr-14	30	72.9	64.0	8.8	-	0.05	8.80	1489	1070	15.5	-
KAX-14-121	10-Apr-14	30	129.9	126.0	8.8	110	0.3	8.75	1435	1020	16.3	-
KAX-14-121	10-Apr-14	20	129.9	98.5	8.8	110	0.02	8.76	1430	1010	15	-
KAX-14-121	11-Apr-14	30	150.9	140.9	8.8	-	0.05	8.65	1443	1020	15.8	-
KAX-14-124	15-Apr-14	27	35.5	32.5	21.7	83	0.1	***	***	***	***	-
KAX-14-124	16-Apr-14	15	43.0	32.5	21.7	83	0.08	***	***	***	***	-
KAX-14-124	17-Apr-14	20	65.5	50.5	21.7	85	0.08	8.80	1712	1210	15.4	
KAX-14-124	18-Apr-14	25	83.5	64.0	21.7	100	0.02	8.95	1287	911	11.2	12.20
KAX-14-124	18-Apr-14	20	103.0	85.0	21.7	55	0.5	8.54	1262	895	11.4	-
KAX-14-128	19-Apr-14	30	23.3	17.0	17.0	80	0.01	9.39	1321	930	8.2	-
KAX-14-128	19-Apr-14	25	32.3	26.3	17.8	100	0.002	9	1330	942	10.4	31.20
KAX-14-128	20-Apr-14	30	45.8	32.3	17.8	50	0.04	8.88	1225	867	11	-
KAX-14-128	20-Apr-14	30	56.3	50.3	17.8	70	0.03	8.64	1223	859	12	43.00
KAX-14-128	21-Apr-14	35	81.8	63.8	17.8	80	0.2	8.38	1047	735	13.4	-
KAX-14-128	22-Apr-14	60	110.3	93.8	17.8	70	0.08	8.6	1279	891	8	-
KAX-14-128	23-Apr-14	30	129.8	110.3	17.8	85	0.2	8.61	1130	805	11.3	24.70
KAX-14-128	24-Apr-14	60	149.3	129.8	17.8	75	0.6	8.53	1380	969	11.3	-
KAX-14-128	25-Apr-14	60	153.8	129.8	17.8	110	0.3	8.07	1197	844	10.1	11.63
KAX-14-130	30-Apr-14	30	44.5	35.5	25.5	70	0.4	8.49	1081	768	***	11.90
KAX-14-130	1-May-14	30	70.0	44.5	25.5	65	0.6	8.6	1060	767	8.2	11.00
KAX-14-130	1-May-14	60	83.5	70.0	25.5	80	0.0	***	***	***	***	75.00
KAX-14-130	2-May-14	60	109.0	82.0	25.5	110	0.2	8.66	1120	804	18.6	7.80
KAX-14-130	3-May-14	30	137.5	109.0	25.5	120	0.2	8.96	1330	937	14.3	7.75
KAX-14-130	3-May-14	30	169.0	137.5	25.5	145	0.8	8.86	1085	612	14.2	10.59

*: indicative parameters (direct and calculated)
**: Water levels collected where possible; at greater depths, and in the inclined boreholes, advancement of a water level tape was not possible.
***: Physiochemical data not collected
****: water level probe could not be advanced past 16 m along drill hole.

3.3.3 Packer Testing

Packer testing was undertaken during and following drilling using a SWiPS packer system adaptable for PQ and HQ hole diameters. A single packer assembly was used during drilling for open hole packer testing over larger intervals, and a double packer assembly (straddle packer) was used after completion of the drillhole to target key intervals. The straddle packer was limited to a maximum span of approximately 10m. Prior to each test the hole was flushed with clean water for at least 10 minutes to remove drilling additives.

Packer intervals were selected to provide an estimate of the hydraulic conductivity of:

- each “bulk” lithological unit;
- zones with apparent low/high air lift yield inflows and permeability (based on drill hole logs); and
- lithological contacts.

A summary of the packer test results is presented in Table 3.4 below. The presented hydraulic conductivity estimates are based on the average hydraulic conductivity measured for each pressure step. Interpretation records are provided in Appendix V.

Table 3.4 Summary of Preliminary Packer Testing Results

Drillhole ID	Test #	Interval (mbgs)	Simplified Lithology	Estimated Hydraulic Conductivity; K (m/s)
KAX-14-107	107-PT2	90.3 – 128.0	NV; competent	3×10^{-10}
	107-ST1	101.5 – 108.5	NV; competent	8×10^{-9}
	107-ST3	68.0 – 74.0	PICR; broken/fractured	4×10^{-7}
	107-ST4	56.0 – 62.0	PICR, soft/massive to 60.5m; fracture zone 60.5 – 62m	3×10^{-7}
KAX-14-108	108-PT1	41.0 – 44.0	NV/PICR contact; Fault/shear zone	7×10^{-8}
	108-PT2	47.0 – 58.0	PICR/NV contact; fractured	3×10^{-7}
	108-PT4	67.5 – 78.5	PICR	7×10^{-9}
	108-PT5	83.5 – 93.5	PICR	4×10^{-9}
	108-PT6	98.8 – 114.5	PICR; some small fracture zones	2×10^{-8}
	108-PT7	132.3 – 148.4	PICR; some fracture zones	2×10^{-8}
	108-ST1	121.8 – 128.0	PICR; fracture/shear zone	3×10^{-8}
KAX-14-114	114-PT1	47.8 – 50.0	PICR; vuggy	2×10^{-7}
	114-PT2	67.3 – 74.0	PICR/NV contact; some fracture zones	2×10^{-8}
	114-PT4	85.8 – 110.0	PICR; many small fracture/shear zones	3×10^{-8}
	114-ST1	79.0 – 85.0	PICR; fault zone, highly altered PICR	1×10^{-9}
	114-ST2	52.0 – 59.5	PICR; highly altered, shear zones	1×10^{-7}
	114-ST3	41.0 – 47.0	PICR; competent	9×10^{-9}
KAX-14-121	121-PT2	14.5 – 27.9	PICR; fractured	4×10^{-7}
	121-PT3	36.4 – 48.9	PICR (fractured) 36.4 – 45.9m; SLD (competent) 45.9m – 48.9m	1×10^{-8}
	121-PT4	65.3 – 72.9	SLD	3×10^{-8}
	121-PT5	99.7 – 129.9	PICR (massive); NV	5×10^{-9}
	121-PT6	125.2 – 129.9	SLD; some fractured PICR	8×10^{-9}
	121-PT7	142.2 – 150.2	SLD/PICR/NV	2×10^{-8}
	121-PT8	110.3 – 150.9	NV/SLD/PICR	3×10^{-9}
	121-ST1	118.0 – 122.5	NV/SLD contact	1×10^{-7}
	121-ST2-2	105.0 – 114.0	NV; competent	6×10^{-9}
	121-ST3	46.0 – 48.0	SLD	5×10^{-9}
KAX-14-124	124-PT1	33.8 – 43.0	PICR; some broken zones	6×10^{-9}
	124-PT2	44.3 – 50.5	PICR; shear zones	2×10^{-7}
	124-PT3	57.8 – 65.5	PICR; potential void	8×10^{-9}
	124-PT4	71.3 – 83.5	PICR; faulted/sheared	9×10^{-8}
	124-PT5	63.8 – 83.5	PICR; potential void and faulted/sheared	1×10^{-7}
	124-PT6	86.3 – 103.0	PICR; fractured	3×10^{-7}
	124-PT7	116.3 – 136.0	PICR/NV; competent	3×10^{-9}
	124-PT8	137.3 – 166.0	PICR/NV/SLD; competent	9×10^{-10}
KAX-14-128	128-PT2	65.1 – 81.8	NV	2×10^{-7}
	128-PT3	95.1 – 110.3	PICR/NV; fractured	4×10^{-8}
	128-PT4	111.1 – 131.0	PICR/NV	4×10^{-10}
	128-PT5	156.1 – 174.8	SLD	7×10^{-9}
KAX-14-130	130-PT1	36.8 – 44.5	PICR to 41.5m; NV to 44.5m	5×10^{-9}
	130-PT2	65.1 – 81.8	Volcanic Breccia to 71.5m; PICR (friable in areas) to 78.5m; NV to 81.8m	4×10^{-8}
	130-PT3	71.3 – 83.5	PICR to 78.5m; NV to 83.5m	1×10^{-8}
	130-PT4	83.3 – 109.0	NV to 100 m; PICR to 101.2 m; NV to 109.0 m	1×10^{-9}
	130-PT5	110.3 – 137.5	NV	4×10^{-9}
	130-PT6	138.8 – 169.0	NV to 140.5 m; PICR to 142.0 m; NV to 169.0 m (incl. brecciated zone)	4×10^{-9}
	130-PT8	189.8 – 226.0	NV; fault zone	5×10^{-9}
	130-ST1	159.8 – 168.8	NV breccia	1×10^{-8}
	130-ST2	56.3 – 64.3	NV; incl. brecciated zone	8×10^{-8}

3.4 Instrumentation

Upon completion of drilling and testing, each drillhole was completed with well instrumentation to monitor groundwater levels and/or water quality. Instrumentation included:

- 50.8 mm (2") Schedule 80 PVC monitoring wells in eight (8) vertical drillholes, and one (1) inclined drillhole (KAX-14-121).
- Two (2) Vibrating Wire Piezometers (RST VW2100 2.0 MPa) in two inclined drillholes (KAX-14-124 and KAX-14-130).

A summary of the well instrumentation is provided in Table 3.5 and in the drill hole logs in Appendix I. Vibrating Wire Piezometer calibration certificates are provided in Appendix VI.

Monitoring wells were installed in a manner consistent with industry standard practices and BC Groundwater Regulations and guidance documents. Van Ruth CW drilling plugs were installed beneath the well screen in drillholes that required greater than approximately 10 m of backfill prior to well install.

Filter packs consisted of 10/20 filter sand applied in the annular space and the depth confirmed after allowing time to settle. A hydrated bentonite plug was applied above the filter pack, and grout tremied to surface.

Properly establishing a filter pack and bentonite seals can be problematic in inclined holes below the water table and, as such, inclined drillhole KAX-14-121 was completed with a pre-packed screen.

Stand-pipe piezometer installation materials generally consisted of the following:

- 2" schedule 80 PVC;
- silica sand (#1);
- Coated Bentonite Pellets;
- cement-bentonite grout (typical grout mix of 378.5 L water : 120 kg cement : 45 kg bentonite);
- Van Ruth Cement and Wedging Plug;
- surface seal of bentonite chips (Enviroplug Medium Bentonite Chips); and
- J-plug and hinged-lid locking well casing.

Vibrating Wire Piezometers were installed by taping the VWP to a 1" Schedule 80 PVC riser pipe which was lowered into the hole. Where necessary to provide additional stability for the placement of rise pipe, Van Ruth plugs were installed beneath the target depth for the VWP. The VWP calibration was checked in the field following the procedures provided by the manufacturer, and readings were recorded periodically following installation to monitor stabilization.

- The VWP string was grouted in place using the PVC riser as a tremie. The A cement-bentonite grout used for installation approximately comprised 340 L water: 120 kg cement : 34 kg bentonite. A datalogger was installed on each VWP prior to demobilization.

Table 3.5 Well Installation Summary

Well Name	Installation Type	Filter Pack Interval (m)	Screened Interval (m)*	Screen Length (m)	Target Interval
KAX-14-107S	Monitoring Well	27.0 – 38.5	29.9 – 38.0	9.1 m (30 ft)	Sand, silt, cobbles (Glacial Till)
KAX-14-107D	Monitoring Well	56 – 76	56.7 – 75	18.3 m (60 ft)	Fractured PICR
KAX-14-108S	Monitoring Well	31.4 – 36.0	32.3 – 35.4	3.1 m (10 ft)	Sand and Gravel (Glacial Till)
KAX-14-108D	Monitoring Well	91.8 – 111.8	71.7 – 90	18.3 m (60 ft)	Fractured PICR
KAX-14-114S	Monitoring Well	19.8 – 32.9	22.0 – 31.1	9.1 m (30 ft)	Sand and Gravel (Glacial Till)
KAX-14-114D	Monitoring Well	98.3 – 124	104.4 – 122.7	18.3 m (60 ft)	Fractured PICR
KAX-14-121	Monitoring Well	141.9 – 150.9	144.1 – 150.2 (135.4 – 141.5)	6.1 m (20 ft)	NV, SLD/PICR
KAX-14-124	VWP	n/a	50.4 (47.4) 190.4 (178.9)	n/a	Above and Below potential “void”
KAX-14-128S	Monitoring Well	9.7 – 18.0	10.9 – 17.0	9.1 m (30 ft)	Sand, silt, clay, and gravel (Glacial Till)
KAX-14-128D	Monitoring Well	70.1 – 90.5	71.7 – 90	18.3 m (60 ft)	Fractured PICR
KAX-14-130	VWP	n/a	175.3 (164.7) 222.3 (208.9)	n/a	Above and Below fault structure

*: metres along borehole; calculated true vertical depth in parentheses where applicable

3.5 Well Development

Following well installation, well development was undertaken by Geotech drilling using the Fraste drill rig air compressor for a minimum of three hours, or until the returned water was clear, free from sand and stable field physiochemical parameters were recorded (pH and electrical conductivity). Development of shallow installations KAX-14-114S and KAX-14-128S was completed by BGC personnel using a surge block.

3.6 Groundwater Monitoring

3.6.1 Groundwater Levels

Prior to demobilization, groundwater levels and VWP readings were collected at each installation. Groundwater levels in KAX-14-121 were not recorded at program completion as development and rehabilitation was ongoing; groundwater levels will be collected at KAX-14-121 by others on behalf of KGHM as part of the site-wide monitoring program. Results are provided in Table 3.6.

Table 3.6 Water Level Measurements

Well ID	Collar Elevation (masl)[1]	Water Level (mbtoc)[2,5]	Stick-up (m)[3]	Water Level (mbgs)	Water Level Elevation (masl)
KAX-14-107S	896.15	3.32	0.44	2.88	893.27
KAX-14-107D	896.15	26.55	1.04	25.51	870.64
KAX-14-108S	901.44	10.04	0.72	9.32	892.12
KAX-14-108D	901.44	56.75	0.63	56.12	845.32
KAX-14-114S	895.53	3.38	0.86	2.52	893.01
KAX-14-114D	895.53	4.93	0.86	4.07	891.46
KAX-14-121	909.26	n/a[4]	0	n/a	n/a
KAX-14-124A KAX-14-124B	903.69	-	0	-	A: 888.3 B: 883.0
KAX-14-128S	904.27	12.15	0.53	11.62	892.65
KAX-14-128D	904.27	11.32	0.05	11.27	893.00
KAX-14-130A KAX-14-130B	895.50	-[6]	0	-[6]	-[6]

1: Provided by KGHM; collar elevation did not differentiate between shallow and deep installations at staggered well locations.
2: Water levels collected by KCB personnel on May 7, 2014.
3: Stick-up measurements as recorded prior to KCB demobilization.
4: Not collected due to ongoing development and rehabilitation.
5: VWP water levels based on pressure head above VWP tip.
6: VWP measurements at KAX-14-130 had not stabilized prior to demobilization.

4 SUMMARY AND CONCLUSIONS

Summary observations from the site investigation are summarized below. These will be augmented as the remaining site investigation activities are completed.

Overburden

- Overburden consists of clay till, with sand/gravel layers of varying thicknesses. Overburden thickness varied from approximately 10 m (KAX-14-121) to 40 m (KAX-14-107), with increasing thickness to the south.
- Horizons which contained sand and gravel ranged in thickness from less than 1 metre to over 11 metres, with thicker layers observed at KAX-14-114 and KAX-14-124. The sand and gravel layers are generally well sorted and typically have higher air lift yields.
- Air lift yields suggest that horizons that contain sand and gravel typically have a higher hydraulic conductivity than silt and clay dominated horizons. Proposed slug testing of monitoring wells will confirm the hydraulic conductivity of these horizons.

Bedrock

- Bedrock in the vicinity of Jacko Lake consists predominantly of fractured and altered picrite, with assemblages of Sugarloaf Diorite, Nicola Volcanics, and volcanic breccia to the north.
- The hydraulic conductivity of competent (i.e., non-fractured, or infilled fractures) bedrock was generally 10^{-8} to 10^{-9} m/s.
- The hydraulic conductivity of fractured bedrock (predominantly picrite) was typically higher and around 10^{-7} m/s.
- The previously observed void was encountered at KAX-14-124, and packer test results indicate that the void and surrounding fractured zones had a higher conductivity than the surrounding fractured and competent bedrock (10^{-7} m/s in the void, 10^{-9} m/s in surrounding bedrock). The packer tests conducted in this zone demonstrated a decrease in flow near the end of the test, suggesting that once the void has filled, there is appreciably less flow from the void to the surrounding bedrock.
- The fault intersected in KAX-14-130 is closed, and has a low apparently hydraulic conductivity (10^{-9} to 10^{-10} m/s), suggesting that the fault is not a hydraulic conduit.
- Inferred faults and shear zones were generally closed and/or infilled with clay or gouge.
- No discrete hydraulic conduits (e.g., open faults) were intersected in the drilling program.

5 LIMITATIONS

This report is an instrument of service of Klohn Crippen Berger Ltd. The report has been prepared for the exclusive use of KGHM Ajax International (Client) for the specific application to the Jacko Lake Hydrogeological Assessment. The report's contents may not be relied upon by any other party without the express written permission of Klohn Crippen Berger. In this report, Klohn Crippen Berger has endeavoured to comply with generally-accepted professional practice common to the local area. Klohn Crippen Berger makes no warranty, express or implied.

The information contained in this report is based on data derived from a limited number of drill holes obtained from widely spaced subsurface explorations. The methods used indicate subsurface conditions only at the specific locations where samples were obtained or where in-situ tests would infer, only at the time they were obtained, and only to the depths penetrated. Conditions may vary between and beyond the drillholes advanced in this program, and the information gathered at the drillholes in this program may not accurately reflect conditions outside of the drillholes.

6 CLOSING

We trust that the contents of this report meet your current needs.

Yours truly,
KLOHN CRIPPEN BERGER LTD.

Mark Bietting, B.Sc.
Project Hydrogeologist

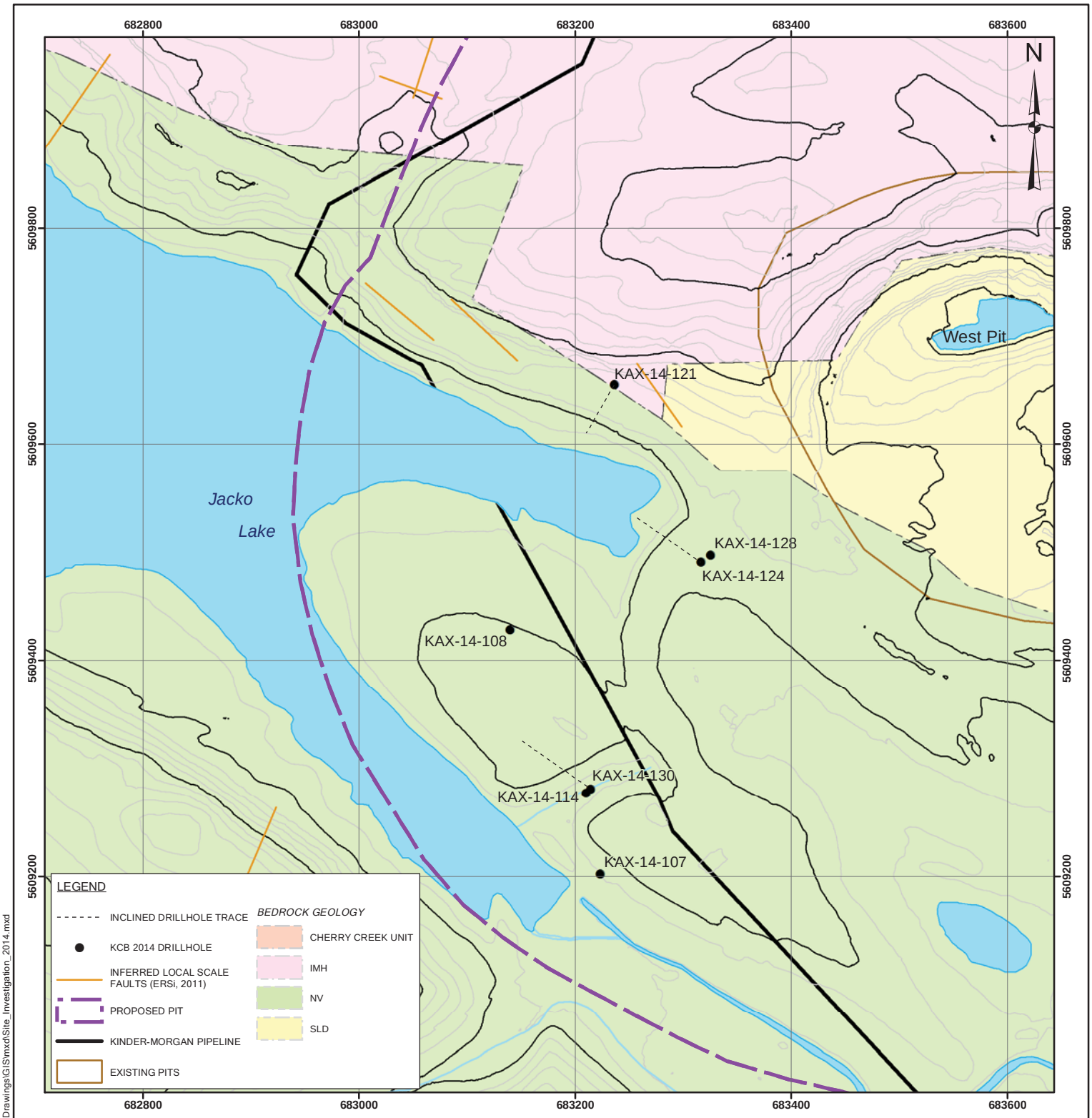
Andrew Hovey, B.Sc.
Project Manager

REFERENCES

Klohn Crippen Berger Ltd. 2013. "Ajax – Jacko Lake Hydrogeology Assessment – Preliminary Hydrogeological Conceptualization – Draft".

Klohn Crippen Berger Ltd. 2014. "Ajax – Jacko Lake Hydrogeology Assessment – Site Investigation Work Plan – Rev A".

FIGURES



NOTES:
1. UTM ZONE 10N, NAD83.
2. BEDROCK GEOLOGY BASED ON AJAX FEASIBILITY STUDY, 2011.
3. MAP DATA AS PROVIDED BY KGHM INTERNATIONAL.
4. JACKO LAKE FOOTPRINT IS APPROXIMATE.
5. INCLINED DRILL HOLE TRACE APPROXIMATE FOR KAX-14-121,KAX-14-124, KAX-14-130.

NOT FOR CONSTRUCTION

SCALE 1:5,000 0 100m

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CLIENT: KGHM INTERNATIONAL AJAX PROJECT

Klohn Crippen Berger

PROJECT: AJAX JACKO LAKE HYDROGEOLOGY ASSESSMENT

TITLE: 2014 DRILLING SITE INVESTIGATION

PROJECT No. M09871A01

FIG No. 1

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APPENDIX I

Drill Hole Logs

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-107

Klohn Crippen Berger

DATE STARTED: Feb 28, 2014	LOCATION: Kamloops, BC	BIT SIZE AND TYPE: PQ3 Impregnated Bit	SHEET 6 OF 15
DATE FINISHED: April 18, 2014	LOGGED BY: MC/DW	RIG MAKE AND MODEL: Fraste Multidrill XL	GROUND ELEVATION (m): 896.2
CLIENT: KGHM International	CHECKED BY: MAB	TOTAL DEPTH (m): 128.0	COORDINATES (m): N 5609202 E 683223
PROJECT NAME: Ajax Mine Groundwater Study	DRILLING CO.: Geotech Drilling Services Ltd.	BEDROCK DEPTH (m): 38.8	COORDINATE SOURCE: KGHM
PROJECT NO.: M09871A01	DRILLER: CO/TL	AZIMUTH/ANGLE FROM VERT.: -90	

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m) (5 10 15)	RUN LENGTH (m)	TCR (%) (25 50 75)	RQD (%) (25 50 75)	SCR (%) (25 50 75)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS
39	26	6		0.70	100	24	24	R3	SW		PICRITE; dark grey to dark green, fine to medium grained, ultramafic, fresh to slightly weathered, medium strong, fractured, filled with clayey gouge, broken core to 39.35 m	Broken Core
								R3	SW			~~Solid Core~~
	27	6		0.30	33	0	0				39.35 m: Core becomes intact, calcite veins filled	Short run to allow drill to be unthreaded. 1st of 2 tubes.
40								R3	F		39.8 m: Becomes fresh with calcite veins 1 mm to 20 mm thick and oriented at 15 and 35 degrees from core axis (FCA)	2nd of 2 tubes
	28	6/7		1.20	100	100	100					
41								R3	F		41.0 m: Calcite veins oriented at 45 degrees FCA	
	29	7/8		1.50	100	85	93					
42								R3	F			
43	30	8		1.50	97	61	73	R0	F		43.44 m to 43.58 m: Clayey gouge and crushed rock zone, joint surfaces are smooth and planar, rock can be broken down in hands, calcite and epidote infill	
44	31	8		0.30	100	0	100	R3	F			
								R3	F		44.70 m: Shear zone with gouge, joint surfaces are rough	
45	32	8/9		1.60	94	59	94					
								R3	F		45.53 m: Clayey gouge with polished joint surfaces	
46								R3	F			
	33	9/10		1.50	100	80	100					

DISCONTINUITY DATA

INSTRUMENT DETAILS	FRACTURE FREQ. (No. Per 30 cm) (2 4)	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
			39.35	J	55	12	Cl	3		
	3		39.88	J	0	2	Ca	3		
			40.00	J	60	2	Ca	3		
	1		40.02	J	60	3	Ca	6		
			40.16	J	60	3	Ca	6		
	2		40.41	J	60	8	Ca	6		
			40.44	J	80	10	Ca	14		
	1		40.75	J	40	3	Ca	14		
			41.06	J	45	2	Ca	6		
	2		41.10	J	20	3	Ca	18		
			41.35	J	45	1	Ca	6		
	1									
			41.94	J	45	1	Ca	6		
	2		41.95	J	20	3	Ca	3		
	4		42.32	J	30	1	Cl	6		
			42.35	J	30	1	Cl	6		
			42.42	J	60	1	Cl	6		
			42.50	J	0		Ca	6		
			42.86	J	35	1	N	18		
	2		43.05	J	40	3	Ca	6		
			43.12	J	40	1	N	18		
	3		43.14	J	15	1	N	18		
			43.28	J	50	3	Ca	14		
	3		43.43	J	40	1	Ca	3		
			43.44	J	40	1	Ca	3		
	3		43.51	J	50	140	Ca	3		
			43.75	J	70	3	Ca	3		
	2		43.78	J	70	3	Ca	3		
			43.83	J	25	1	Cl	3		
	2		44.12	J	40	<1	Ca	6		
			44.30	J	15	1	Ca/Cl	18		
	3		44.40	J	57	<1	Ca/Cl	3		
			44.50	J	45	11	Ca/Cl	5		
	1		44.70	J	30	30	Cl	14		
			44.82	J	61	<1	Ca/Cl	3		
	1		44.87	J	48	1	Ca/Cl	4		
			45.00	J	62	<1	Ca	3		
	3		45.14	J	59	1	Ca	3		
			45.40	J	59	<1	Ca	8		
			45.42	J	45	<1	Ca	4		
			45.53	S	52	15	Cl	3		
			45.65	J	41	1	Ca	6		
			45.67	J		<1	Ca/T/Ch	15		
						<1	Ca/Cl	4		

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None Cl: Clay Qtz: Quartz FeOx: Iron Ca: Calcite NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh SW: Slightly MW: Moderately HW: Highly CW: Completely RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 3: Slightly Rough, Undulating 5: Rough Undulating, Stepped 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

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GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-107

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m) (5 10 15)	RUN LENGTH (m)	TCR (%) (25 50 75)	RQD (%) (25 50 75)	SCR (%) (25 50 75)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION (continued from previous page)	DRILLING REMARKS	INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm) (2 4)	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
47								R3	F					1		47.21	J	48	3	Cl	17		
	34	10/11		1.50	100	68	90				47.59 m: Broken core with clayey gouge infill, no slickensides or polished surfaces			1		47.59	J	39	5	Cl	17		
48								R3	F					1		48.05	J	58	<1	Ca/E	10		
											48.50 m: Some joints with smooth and planar surfaces and clayey gouge infill			1		48.35	J	50	<1	Ca/E/Ch	3		
								R3	F							48.82	J	80	1	Ca	18		
49	35	11		1.50	97	96	96							1		49.15	J	45	15	Cl	1		
														1		49.52	J	50	1	Ca	18		
														1		49.94	J	65	3	Cl	1		
50								R3	F														
														2		50.52	J	45	1	N	18		
	36	11/12		1.50	97	92	92							1		50.58	J	15		Ca, Sp	6		
51														1		50.82	J	65	1	N	3		
														1		51.07	J	60	1	Sp	6		
								R3	F		51.50 m: Start to see slickensided joints and serpentinite infill on fracture surfaces					51.50	J	70		N	3		
														3		51.67	J	40	3	Ca, Sp	3		
52																51.75	J	50	1	Ca, Sp	1		
	37	12/13		1.50	97	49	63									52.16	J	40	80	Cl	1		
														2		52.24	J	80	1	Cl	18		
								R0	F		52.4 843.7 FRACTURED ZONE; several criss-crossing fractures infilled with clayey gouge, serpentinite, and calcite, some slickensides, rock is extremely weak and can be broken down in hands					52.42	S	25	480	Cl, Sp, Ca	1		
											52.9 843.3			6									
53								R0-R3	F		PICRITE; dark grey to dark green, fine to medium grained, ultramafic, fresh, medium strong, fractures typically have clay and serpentinite infill, slickensided joints, some quartz veins			6									
														1		53.46	J	60	80	Cl, Ca	10		
	38	13		1.50	97	54	71									53.98	J	60	5	Cl, G	18		
54														4		54.02	J	55	10	Cl, Sp	1		
																54.15	J	40	1	Cl, Sp	1		
														3		54.18	J	70	70	Cl, Sp	1		
																54.36	J	70	1	Cl, Sp	1		
								R3	F		54.50 m: Becomes massive, abundant healed fractures with clayey and calcite infill					54.39	J	60	50	Cl	18		
55																54.50	J	30	1	Cl	1		
	39	14		1.50	97	97	100																
														1		55.96	J	50	1	Ca	14		
56								R3	F														

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None Cl: Clay Qtz: Quartz FeOx: Iron Ca: Calcite NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh SW: Slightly MW: Moderately HW: Highly CW: Completely RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 3: Slightly Rough, Undulating 5: Rough Undulating, Stepped 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-107

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m)	RUN LENGTH (m)	TCR (%)	RQD (%)	SCR (%)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS
			5 10 15		25 50 75	25 50 75	25 50 75				(continued from previous page)	
57	40	14/15		1.50	97	95	100	R1	F		57.23 m to 57.50 m: Becomes very weak, can be peeled with a putty knife	
								R3	F			
58	41	15/16		1.50	97	85	95					
59	42	16		1.50	97	84	88	R3	F			
60											60.5 / 835.7	
								R0	F		FRACTURED ZONE; joints are infilled with clayey gouge and serpentinite and are smooth and planar to slickensided	
61	43	16/17		1.50	97	33	59	R2	F		61.48 m: Becomes weak, criss-crossing calcite veins	
62											62.0 / 834.2	
								R3	F		PICRITE; dark grey to dark green, fine to medium grained, ultramafic, fresh, medium strong	
63	44	17/18		1.50	97	97	97					
64	45	18		1.50	97	76	88	R3	F			
65								R2	F			
	46	19		1.50	97	87	93					

INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm)	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
	2 4									
	1		56.53	J	60	50	Ca	3		
	1		56.84	J	60	3	T, Ca	1		
			57.23	J	65	2	T, Ca	1		
	2		57.48	J	70	4	T, Ca	3		
	2		57.50	J	80	1	Ca	3		
			57.57	J	65		Ca	3		
	1		57.94	J	70	10	Ca	3		
	1		58.43	J	70	30	Ca	10		
	1		58.90	J	70	10	Ca, Cl, Sp	10	Straddle 4 3 x 10-7	
	1		59.19	J	80	1	T, Ca	18		
	1		59.83	J	75	6	T, Ca	3		
	3		60.53	J	30	3	Ca, Sp	1		
	3		60.61	J	50	2	Ca, CSp	6		
	2		60.63	J	40	<1	Sp	1		
	2		60.71	J	40	8	Cl	1		
	1		60.81	J	60	10	Cl	10		
	1		61.00	J	25	4	T, Sp	1		
	2		61.14	S	20	80	Cl, Sp	1		
	2		61.42	J	40	1	Cl, Sp	3		
	6		61.48	J	60	3	Ca	18		
	1		62.21	J	55	1	Ca	1		
	1		62.33	J	60	1	Sp	3		
	1		62.65	J	60	1	Ca	3		
	1		63.13	J	45	1	Ca, Sp	1		
	1		63.37	J	55	3	Cl, Ca	3		
			63.50	J	70		T	3		
	4		63.69	J	50	3	Ca	6		
	1		63.71	J	70	<1	Ca	18		
	1		63.72	J	70	1	Ca	10		
	2		64.19	J	60	1	T	3		
	2		64.23	J	80	2	N	3		
	5		64.81	J	65	60	Cl	10		
			64.83	J	65	1	T, Ca	3		
	3		64.85	J	55	1	Ca, Sp	1		
			64.93	J	55	1	Ca, Sp	1		
			65.00	J	55	1	N	4		
			65.06	J	46	1	Ca, T, Sp	4		
			65.24	J	30	1	Ca, T, Sp	12		

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None FeOx: Iron Cl: Clay Ca: Calcite Qtz: Quartz NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh HW: Highly SW: Slightly CW: Completely MW: Moderately RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 5: Rough Undulating, Stepped 3: Slightly Rough, Undulating 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-107

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m) (5 10 15)	RUN LENGTH (m)	TCR (%) (25 50 75)	RQD (%) (25 50 75)	SCR (%) (25 50 75)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS	INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm) (2 4)	DISCONTINUITY DATA: FRACTURE ZONE	DISCONTINUITY DATA: DISCONT. DEPTH (m)	DISCONTINUITY DATA: DISCONT. TYPE	DISCONTINUITY DATA: ANGLE To Core Axis (TCA)	DISCONTINUITY DATA: APERTURE (<1,1-3,>3mm)	DISCONTINUITY DATA: INFILL TYPE	DISCONTINUITY DATA: JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
											(continued from previous page)												
								R2	F		66.40 m: 0.1 m zone of broken core in core catcher			2		65.93	J	57	1	Ca, T, Sp	14		
								R2	F					2		66.12	J	37	1	Ca, T, Sp	8		
																66.27	J	50	1	Ca, T, Sp	14		
																66.40	J	55	1	Ca, T, Sp	14		
67	47	19/20		1.50	97	100	100																
														1		68.00	J	63	1	Cl, T, Ca			
68								R2	F														
														1		68.32	S	41	1	Ca, T, Sp	8		
	48	20		1.50	97	100	100																
69																							
								R2-R3	F			Joint at 70.58 m was closed when the core sample was pulled from the sample tube, however it broke open during handling and so was logged as a joint.		1		69.69	J	49	1	Ca, Sp, T	12		
70																70.15	J	40	1	Ca, Sp, T	10		
	49	21		1.50	97	100	100							2									
																70.58	J	64	1	T, Ca			
71								R2-R3	F					1		71.10	J	64	1	T, Ca	3	Straddle 3 4 x 10-7	
														1		71.35	J	68	1	T, Ca	4		
	50	22		1.50	97	95	100																
72														2		71.95	J	74	1	T, Ca	14		
																72.18	J	51	<1	T, Sp	4		
														1		72.47	J	59	1	T, Sp	14		
								R2-R3	F		10 mm thick calcite veins at 73.35 m and 73.65 m			1		72.69	J	85	<1		14		
73																73.12	J	86	<1		10		
	51	22/23		1.50	97	100	100							2		73.37	J	64	<1		16		
																73.83	J	41	<1		16		
74								R2-R3	F					1		74.18	S	16	1		2		
								R2-R3	F		74.18 m: Slickensided joint			1									
								R2-R3	F		74.30 m: Vein or healed joint with calcite and serpentinite infill, 5 mm thick, oriented at 16 degrees FCA												
	52	23		1.50	97	100	100																
75														1		75.02	J	75	<1		10		

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None FeOx: Iron Cl: Clay Ca: Calcite Qtz: Quartz NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh HW: Highly SW: Slightly CW: Completely MW: Moderately RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 5: Rough Undulating, Stepped 3: Slightly Rough, Undulating 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R3: Medium Strong (25-30) R6: Extremely Strong (>250) R1: Very Weak (1-5) R4: Strong (50-100) R2: Weak (5-25) R5: Very Strong (100-250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-107

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m) (5 10 15)	RUN LENGTH (m)	TCR (%) (25 50 75)	RQD (%) (25 50 75)	SCR (%) (25 50 75)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS
											(continued from previous page)	
76	53	23/24		1.50	97	83	91	R2	F		75.5 m: Joints become stepped to smooth and wavy but also exhibit striations and glossy surfaces, calcite veins pervasive down to 77.75 m	
77	54	24/25		1.50	97	100	100	R2-R3	F			
78	55	25		1.50	97	93	93	R2-R3	F		78.50 m to 78.60 m: Broken core, drill breaks along soft healed joints, typically have clayey gouge and rock fragment infill, not slickensided	
79												
80	56	26		1.50	97	93	100	R2-R3	F			
								R1	F		80.30 m: 20 mm talc altered zone, very weak, possible healed fracture, oriented at 71 degrees	
81								R1	F		80.86 m: Becomes finer grained and more talc altered	
82	57	26/27		1.50	97	73	89	R2-R3	F			
83	58	27		1.50	97	87	97	R2-R3	F			
84												
								R3-R4	F		84.5 811.7 MAFIC VOLCANICS (MV); dark greenish grey, fine to med. grained, fresh, med-strong to strong, jointed, few calcite veins 1 mm thick, 87.38 m to 87.43 m	Loss of top
85												

INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm) (2 4)	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
	1		75.54	J	60	1	Ca, Sp	18		
	1		76.04	J	50	1	Ca, Sp	18		
	2		76.43	J	70	3	Ca, Sp	10		
			76.70	J	55	20	Ca, Sp	10		
	1		78.05	J	26	1	Ca, T, Sp	10		
	1		78.31	J	55	1	Ca, T, Sp	3		
	2		78.60	J	47	<1	T, Sp	8		
			78.72	J	48	1	Sp, Ca	14		
	1		79.05	S	54	6	Cl, Ca, Sp, T	10		
	1		79.50	J	54	<1	T, Sp	16		
	2		80.35	J	71	2	T, Cl	6		
			80.49	J	55	1	Sp, T, Ca	8		
	2		80.77	J	78	1	Sp, T, Ca	18		
			80.86	J	41	1	Sp, T, Ca	2		
	1		81.15	J	29	1	Cat, T	6		
	3		81.50	J	40	<1	Cl	3		
			81.57	J	50	<1	Ca, Sp	3		
			81.67	J	50	1	Ca	3		
	1		82.81	J	30	1	Ca, Sp	3		
	1		83.30	J	45	3	Ca	10		
	2		83.70	J	70	10	Ca	18		
			83.90	J	45	1	Cl, Sp	3		
	1		84.01	J	10	3	Cl, Sp, Ca	3		
	1		84.22	J	10	1	Ca, T, Sp	6		

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None Cl: Clay Qtz: Quartz FeOx: Iron Ca: Calcite NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh SW: Slightly MW: Moderately HW: Highly CW: Completely RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 3: Slightly Rough, Undulating 5: Rough Undulating, Stepped 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-107

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m) 5 10 15	RUN LENGTH (m)	TCR (%) 25 50 75	RQD (%) 25 50 75	SCR (%) 25 50 75	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS	INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm) 2 4	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
											(continued from previous page)												
	59			1.50	90	71	86				shear zone with crushed rock, clayey gouge, Sp and Ca infill.			2		85.45	J	35	1	Ca, Sp	10		
														1		85.50	J	15	2	T, Ca, Cl	10		
86														1		85.82	J	50	15	Ca, Sp	14		
																85.87	J	70	20	Ca, Chl, Sp	14		
	60			1.50	100	72	74	R3-R4	F					1		86.00	J	40	1	Ca, Cl	1		
																86.07	J	70	>3	Ca, Chl	6		
87														2		86.38	J	50	3	Ca, Chl, Sp	3		
																86.51	J	65	>3	Ca, Sp, Gr?	10		
																86.61	J	30	>3	Ca, Sp, Chl	14		
														2		86.77	J	70	>3	Ca, Sp, Chl	3		
														1		86.89	J	55	>3	Ca, Sp	14		
																87.27	J	45	>3	Ca, Sp	14		
														3		87.40	J/S	55	45	Ca, Sp, Cx, Cl	1		
																87.52	J	50	>3	Ca, Sp	4		
88	61			1.50	96	92	95	R3	F		Few calcite veins 3mm to 5mm thick. 88.48 to 88.54 m healed fractures (brecciated) with calcite, serpentinite infill, R0/R1, fresh			1		88.23	J	35	<3	Sp, Chl, Gy	3		
														1		88.48	J/S?	90	-	Sp, Ca, Cx	-		
89														1		88.95	J	30	-	Sp, Ca, Chl	3		
	62			1.50	93	90	93	R3	F		Few calcite veins 1mm to 5mm thick.			1		89.37	J	60	<3	Ca, Sp	3		
90												Packer test from 90 m to 128 m											
	63			1.50	97	93	97	R3	F		Some calcite veins <1 mm to 5 mm thick; 90.50 m to 90.79 m healed microfractures with Ca/Sp infill.			1		91.62	J	60	-	Ca, Sp, Chl	3		
91																							
92																							
	64			1.50	99	95	99	R3	F					1		92.73	J	30	<3	Ca, Sp, Cy	1		
93														1		93.07	J	30	<3	Ca, Sp, Cy	3		
														1		93.43	J	35	>3	Ca, Sp	6		
														1		93.69	J	90	>3	Ca, Sp	6		
94	65			1.50	97	97	97	R3	F					1		93.96	J	80	>3	Ca, Sp	6		
														1		94.52	J	45	-	Sa, Sp	6		

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None FeOx: Iron Cl: Clay Ca: Calcite Qtz: Quartz NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh HW: Highly SW: Slightly CW: Completely MW: Moderately RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 5: Rough Undulating, Stepped 3: Slightly Rough, Undulating 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-107

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m) 5 10 15	RUN LENGTH (m)	TCR (%) 25 50 75	RQD (%) 25 50 75	SCR (%) 25 50 75	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS	INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm) 2 4	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
											(continued from previous page)												
95								R3	F		97.20 m to 97.28 m shear zone with broken rock, calcite, and serpentinite infill			2		95.08	J	80	-	Ca, Sp, Chl	6		
																95.19	J	80	<3	Ca, Sp, Chl	6		
96	66			1.50	97	80	93							2									
								R3	F		97.66 m to 97.87 m healed microfractures infilled with calcite, serpentinite, and clay.												
97	67			1.50	100	100	100									97.16	J	50	>3	Ca, Sp	3		
																97.20	J/S	90	80	Ca, Sp, Cx	-		
														1									
98								R3	F		98.0 798.2 PICRITE; dark greenish grey, fine to medium grained, fresh, medium strong, some calcite veins <1 mm to 5 mm thick.			2									
	68			1.50	100	100	69							6									
99														6									
														6									
								R3	F		99.60 m: 10 mm thick calcite vein at 20 degrees to core axis. 100.08 m to 100.38 m: jointed												
100	69			1.50	100	83	83							6									
														1		100.64	J		45	Ca, Chl, Sp	14		
101								R1-R2	F		101.5 to 103.50 m: dark greenish grey, fresh, abundant v. weak to weak rock; healed microfractures.			2		101.12	J	40	>3	Ca, Chl, Gy?	14		
																101.25	J	60	>3	Ca, Chl, Gy?	14		
	70			1.50	87	78	87							1		101.50	J	55	-	Ca, Chl	14		
102																							
								R0-R2	F		103.79 m to 104.00 shear zone with broken rock, chlorite and epidote infill. Rock is weak and crumbles in hand.			6									
103														6									
	71			1.50	100	51	51																
														6									
														6									
104								R1-R3	F		Some calcite veins 1 mm to 3 mm thick.												

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None Cl: Clay Qtz: Quartz FeOx: Iron Ca: Calcite NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh SW: Slightly MW: Moderately HW: Highly CW: Completely RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 3: Slightly Rough, Undulating 5: Rough Undulating, Stepped 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-107

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m) 5 10 15	RUN LENGTH (m)	TCR (%) 25 50 75	RQD (%) 25 50 75	SCR (%) 25 50 75	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS	INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm) 2 4	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
											(continued from previous page)												
105	72			1.50	85	69	73				104.43 mm to 104.52 mm: shear zone with gravel (maximum grain size ~15 mm) 104.86 m to 105.20 m: healed microfractures with calcite and serpentinite infill.			6 1		105.42	J	65	>3	Ca, Chl, Ep?	14	Straddle 1 8 x 10-9	
106	73			1.50	100	88	99	R1-R2	F		Faulted with clay infill			1		106.05	J	60	>3	Ca, Chl	18		
107	74			1.50	100	82	99	R1-R3	F		107.69 m to 107.70 m: shear zone with crushed rock, calcite and serpentinite infill. 107.95 m to 107.98 m: shear zone, as above.			3 1 1		106.43 106.48 106.69 106.79 107.10 107.69 107.95	J/F J/F J J/F J J/S J/S	90 45 75 90 60 75 45	>3 - <3 >3 >3 >3 >3	Cl, Ca, Chl Ca, Chl, Sp, Cl Ca, Chl, Cl Ca, Chl, Sp, Cl Ca, Chl, Sp, Cl Ca, Sp, Cy Ca, Sp, Cy	18 18 3/18 18 18 18 18		
108														1									
109	75			1.50	100	94	100	R0-R1	F		108.50 m to 109.10 m: some calcite veins 1 mm to 5 mm thick. 109.10 to 110 m: healed microfractures.			2		109.02 109.09	J J	75 45/90	>3 >3	Ca, Sp Ca, Sp	18 18	PT2 3 x 10-10	
110	76			1.50	100	81	84	R0-R3	F		Healed microfractures and calcite veins up to 20 mm thick. 111.11 m to 111.17 m: shear zone with broken rock, clay coating, and calcite and serpentinite infill. 111.24 m to 111.28 m: shear zone, as above. 111.38 m to 111.47 m: shear zone, as above.			1 1 1		110.35 111.11 111.24 111.38	J J/S? J/S J/S	40 90 - -	<3 60 40 50	Ca, Sp Ca, Chl, Cl Ca, Chl, Cl Ca, Chl, Cl	6 18 18 18		
111														2		111.50	J/s	45	-	Ca, Sp	10		
112	77			1.50	100	87	86	R2-R3	F		111.50 m to 111.95 m: healed microfractures with calcite, serpentinite, and chlorite infill.			2 1 1		111.62 112.16 112.46	J S? J	20 90 60	<3 130 -	Ca, Sp, Gy Cx, Ca, Sp Ca, Sp	10 18 6		
113	78			1.50	100	100	100	R3	F		Some calcite veins up to 15 mm thick.			1		113.50	J	55	-	Ca, Sp	3		

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None Cl: Clay Qtz: Quartz FeOx: Iron Ca: Calcite NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh SW: Slightly MW: Moderately HW: Highly CW: Completely RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 3: Slightly Rough, Undulating 5: Rough Undulating, Stepped 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-107

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m)	RUN LENGTH (m)	TCR (%)	RQD (%)	SCR (%)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS	INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm)	DISCONTINUITY DATA: FRACTURE ZONE	DISCONTINUITY DATA: DISCONT. DEPTH (m)	DISCONTINUITY DATA: DISCONT. TYPE	DISCONTINUITY DATA: ANGLE To Core Axis (TCA)	DISCONTINUITY DATA: APERTURE (<1,1-3,>3mm)	DISCONTINUITY DATA: INFILL TYPE	DISCONTINUITY DATA: JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
			5 10 15		25 50 75	25 50 75	25 50 75				(continued from previous page)			2 4									
114														1		114.49	J	45	>3	Ca, Sp, Chl	14		
115	79			1.50	90	78	85	R2	F		114.50 m to 115.30 m: brecciated with calcite infill. 115.30 m to 115.73 m: massive with less than 1 mm thick calcite veins. 115.73 m to 116.00 m: brecciated, as above.			1		114.85	J	70	1	Ca, Cl	14		
														2		115.24	J	40	3	Ca, Chl	10		
														3		115.49	J	40	1	Ca, Chl, Sp	3		
																115.54	J	40	1	Ca, Chl, Sp	3		
116	80			1.50	100	82	100	R2	F		Brecciated, as above with calcite infill.			2		116.16	J	50	1	Ca	3		
																116.20	J	65	1	Ca, Chl	3		
														2		116.55	J	60	1	Ca, Chl	3		
																116.59	J	60	1	Ca, Chl	3		
117														1		117.40	J	80	1	Ca, Chl, Cl	10		
118	81			1.50	100	89	95	R2	F		Brecciated, as above with calcite infill.			1		117.69	J	50	30	T, Cl, Cx	3		
														1		117.89	J	35	1	Ca, Chl	3		
														1		118.35	J	45	1	Ca, Chl	3		
																118.52	J	40	1	Ca, Chl, Cl	70		
														3		118.87	J	60	>3	Ca, Chl, Ep?	18		
119																118.90	J	90	>32	Ca, Sp	6		
	82			1.50	100	100	100	R3	F		Brecciated, as above with calcite infill.					118.92	J	45	>33	Ca, Sp	6		
														1		119.46	J	70	>3	Ca, Chl, Sp	14		
120																119.92	J/V	60	1	Ca, Sp	10		
																120.25	J/V	50	>3	Ca, Chl, Sp	3		
														2		120.41	J	60	>3	Ca, Chl, Sp	3		
121	83			1.50	96	96	96	R3	F		121.54 m to 121.65 m: healed microfractures with calcite and serpentinite infill.			1		121.08	J/V	75	>3	Ca, Chl, Sp	8		
														2		121.17	J/V	55	<3	Ca, Chl, Sp	10		
																121.27	J	75	>3	Ca, Chl, Sp	14		
														1		121.65	J	40	>3	Ca, Chl, Sp	10		
122																122.00	J	50	-	Ca, Chl, Sp	3		
	84			1.50	100	100	100	R3	F					2		122.26	J	50	1	Ca, Chl, Sp	14		
														1		122.51	J	70	>3	Ca, Chl, Sp	14		
123														2		122.97	J	55	>3	Ca, Chl, Sp	18		
																123.13	J	40	<3	Ca, Chl, Sp	14		

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:

DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack

INFILL TYPE: N: None FeOx: Iron Cl: Clay Ca: Calcite Qtz: Quartz NC: Non-Cohesive

ROCK MASS WEATHERING: F: Fresh HW: Highly SW: Slightly CW: Completely MW: Moderately RS: Residual Soil

JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 5: Rough Undulating, Stepped 3: Slightly Rough, Undulating 6: Very Rough, Stepped

HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-107

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m)	RUN LENGTH (m)	TCR (%)	RQD (%)	SCR (%)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS	INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm)	DISCONTINUITY DATA: FRACTURE ZONE	DISCONTINUITY DATA: DISCONT. DEPTH (m)	DISCONTINUITY DATA: DISCONT. TYPE	DISCONTINUITY DATA: ANGLE To Core Axis (TCA)	DISCONTINUITY DATA: APERTURE (<1,1-3,>3mm)	DISCONTINUITY DATA: INFILL TYPE	DISCONTINUITY DATA: JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
			5 10 15		25 50 75	25 50 75	25 50 75				(continued from previous page)			2 4									
124	85			1.50	100	96	100	R3	F					1		123.70	J	65	3	Ca, Chl, Sp	14		
														1		123.83	J	65	>3	Ca, Chl, Sp	14		
														2		123.89	J	65	<3	Ca, Chl, Sp	6		
														2		124.15	J	55	>3	Ca, Chl, Sp	3		
														2		124.29	J	60	>3	Ca, Chl, Sp	3		
125																							
	86			1.50	85	78	85	R3	F					1		125.28	J/V	70	<3	Ca, SP	6		
														2		125.67	J	80	>3	Ca, SP	18		
126														2		125.75	J	90	>3	Ca, SP	18		
														1		125.93	J	80	>3	Ca, SP	18		
								R3	F		Healed microfractures with calcite infill.												
127	87			1.50	100	99	100							1		127.26	J	45	>3	Ca, Chl, Sp	6		
														2		127.81	J	75	>3	Ca, Chl, Sp	18		
128											128.0 / 768.2 End of Hole at: 128.0 m			2		128.01	J	50	>3	Ca, Chl, Sp	3		
129											Shallow Monitoring Well: 50.8 mm (2") Schedule 80 PVC Standpipe with slotted screen. Screen 29.9 to 38.0 mbgl Filter pack 27.0 to 38.5 mbgl Deep Monitoring Well: 50.8 mm (2") Schedule 80 PVC Standpipe with slotted screen. Screen 56.7 to 75 mbgl Filter pack 56 to76 mbgl Deep monitoring well installed in an offset hole. Negligible changes in lithology over the short offset distance were recorded.											
130																							
131																							
132																							

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None FeOx: Iron Cl: Clay Ca: Calcite Qtz: Quartz NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh HW: Highly SW: Slightly CW: Completely MW: Moderately RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 5: Rough Undulating, Stepped 3: Slightly Rough, Undulating 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-108

Klohn Crippen Berger

DATE STARTED: Mar 11, 2014	LOCATION: Kamloops, BC	BIT SIZE AND TYPE: PQ3 Impregnated Bit	SHEET 5 OF 17
DATE FINISHED: Mar 26, 2014	LOGGED BY: MC/MK	RIG MAKE AND MODEL: Fraste Multidrill XL	GROUND ELEVATION (m): 901.4
CLIENT: KGHM International	CHECKED BY: MAB	TOTAL DEPTH (m): 148.4	COORDINATES (m): N 5609428 E 683140
PROJECT NAME: Ajax Mine Groundwater Study	DRILLING CO.: Geotech Drilling Services Ltd.	BEDROCK DEPTH (m): 37.6	COORDINATE SOURCE: KGHM
PROJECT NO.: M09871A01	DRILLER: CO/JA/TL	AZIMUTH/ANGLE FROM VERT.: -90	

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m) (5 10 15)	RUN LENGTH (m)	TCR (%) (25 50 75)	RQD (%) (25 50 75)	SCR (%) (25 50 75)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS	INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm) (2 4)	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
38	31	7		0.24	100	100	100	R3	SW-F		NICOLA VOLCANICS, fine grained, grey, slightly weathered to fresh, medium strong, calcite veins at 55° and 25°, 1 mm to 6 mm thick, fractures preferentially along 55° calcite veins under hammer blows												
								R3	F					1		38.18	J	45	5	Ca	14		
														1		38.48	J	60	1	Ca	10		
	32	7/8		1.50	100	68	89							2		38.65	J	70	3	Ca,Sp	3		
39																38.72	J	20	1	Ca,Sp	3		
														1		39.03	J	70	1	Ca	3		
																39.19	J	50	1	Ca	18		
														4		39.25	J	40	<1	Ca	3		
								R3	F		At 39.50 m: Start to see gypsum and quartz infill					39.38	J	40	3	Ca	18		
														1		39.48	J	15	3	Ca	3		
																39.77	J	35	1	Ca	16		
40														3		39.82	J	65	1	Gy	3		
	33	8/9		1.50	93	56	81									39.87	J	60	3	N	18		
														2		40.05	J	60	-	Gy,Qtz	3		
																40.17	J	50	-	Gy	10		
														2		40.32	J	60	1	Gy	18		
																40.40	J	40	8	Qtz,Gy	14		
																40.63	J	80	1	Gy	6		
41								R3	F		At 40.83 m: NICOLA VOLCANICS, fine to medium grained, greenish grey, fresh, moderately altered, weak, quartz veins at 0-5, degrees, gypsum veins at 40-45 degrees, 3 to 10 mm thick 41.26 m to 41.38 m: Fault zone At 41.33 m: 25 mm fault zone 41.47 m to 41.57 m: Fault zone 41.86 m to 41.87 m: Fault zone												
								R2	F					6		41.26	F	54	120	Cl,Bx,Cx,Sp	6		
								R2	F							41.33	F	5	25	Cl,Bx,Cx,Sp,Chl	2		
								R2	F					6		41.38	F	60	100	Cl,Bx,Cx,Sp	3		
	34	9		1.50	82	37	41	R2	F							41.47	F	20	2	Cl,Gy,Bx,Cx,Sp	10		
														6		41.57	F	23	2	Cl,Gy,Bx,Cx,Sp	10		
42								R2	F							41.76	J	5	-	Ca	14		
								R2	F	42.1 859.4				6		41.78	V	54	10	Gy	2		
																41.86	F	25	5	Bx,Cl,Sp,Gy,Cx	6		
														6		42.02	J	85	110	Bx,Gy	1		
								R2	F		PICRITE, fine grained, dark green, moderately altered, weak, highly sheared/faulted, core is magnetic 42.50 m to 43.05 m: fault/shear zone, broken rock, max size of 20 mm 43.35 m to 43.47 m: fault/shear zone, broken and crushed rock and serpentinite					42.08	F	17		Cx,Sp,Bx		PT1 7 x 10-8	
43														6									
	35	10		1.50	100	21	21									43.05	J	28	>3	Chl,Sp	10		
								R2	F					6		43.35	F	71	120	Bx,Sp,Cx	5		
																43.47	F	25	2	Bx,Sp,Cx	1		
														6		43.53	J	28		Sp,Chl	1		
								R2	F		43.84 m to 44.00 m: fault/shear zone, broken and crushed rock			6		43.84	F	50	160	Cx,Sp,Bx,Chl	1		
44								R1	F		Very weak and friable fractures are typically slickensided and infilled with crushed rock, serpentinite and talc 44.59 m to 45.00 m: Shear zone, broken and crushed rock and serrpentinite					44.00	F	-		Cx,Sp,Bx,Chl			
														6		44.23	J	50	40	T,Cx,Sp	1		
														6		44.46	J	50	3	T,Cx,Sp	1		
	36	10/11		1.50	100	0	13									44.56	J	20	30	T,Cx,Sp	1		
								R1	F					6		44.63	S	50	80	Cx,Sp	1		
45														6		45.11	S	25	180	Cx,Sp	1		
														6		45.41	S	20	2	Cx,Sp	1		

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None Cl: Clay Qtz: Quartz FeOx: Iron Ca: Calcite NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh SW: Slightly MW: Moderately HW: Highly CW: Completely RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 3: Slightly Rough, Undulating 5: Rough Undulating, Stepped 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-108

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m) (5 10 15)	RUN LENGTH (m)	TCR (%) (25 50 75)	RQD (%) (25 50 75)	SCR (%) (25 50 75)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS
											(continued from previous page)	
46	37	11		1.50	91	33	55	R2 R2	F F		More intact, no longer in shear zone 45.59 m to 46.64 m: Shear zone, crushed rock with serpentinite infill and slickensided fracture surfaces	
47	38	12		0.69	94	84	70	R2-R3	F			Run blocked, pulled tube early
48	39	12		1.44	100	22	26	R1 R1 R2	F F F		At 47.60 m: start to see stockwork calcite veins, abundant healed fractures 47.69 m to 47.83 m: Shear zone, clayey gouge with crushed rock, fractures are slickensided 48.4 / 853.1 NICOLA VOLCANICS, no longer stockwork veining, weak dark green (serpentinite?) alteration	Last 0.84 m of run dropped on split
49	49	13		0.87	100	36	60	R2	F			
50	50	13		1.50	42	21	27	R3 R3	F F		50.32 m to 51.50 m: core loss	Majority of run was lost. Core tube may have locked so core was in core barrel while drilling. Cannot determine fracture frequency. Driller reported bit was plugging up during run, possible clay infill in fractures that was washed away. Circulation good in this material. Assumed core loss off bottom of run. Assumed loss from clay material at top of this run.
51	51	13/14		1.50	73	0	12	R3 S3 R1-R2 R1-R2	F F F F		51.50 m to 51.90 m: core loss 51.90 m to 52.10 m: Shear zone, clayey gouge and crushed rock, greenish grey, slickensided fractures, clay is firm, rock is friable and extremely weak 52.1 / 849.3 PICRITE, dark grey, fine to medium grained, fresh very weak to weak, highly fractured 52.44 m: Sub-vertical shear zone, clayey gouge and crushed rock infill, soft brown mineral present	
52	52	14		1.50	97	0	15	S3-R1 S3-R1	F F		53.20 m to 53.50 m: Shear zone, crushed rock and clayey gouge, friable, calcite and serpentinite infill, slickensided joints	
54								S3-R1	F		54.50 m to 54.67 m: Core loss	Assumed loss off top of run because driller flushed hole
55												

INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm) (2 4)	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
	6		45.80	J	70	2	Sp	3		
	6		45.87	J	45	4	Ca,Sp	10		
			46.16	J	25	<1	Sp	18		
	2		46.26	J	55	1	Sp	1		
			46.32	J	55	1	Sp	1		
	3		46.59	S	50	50	Sp	1		
	6									
	6		47.21	J	60	5	Sp	10		
	1		47.44	J	60	-	Sp	10		
			47.60	S	20	60	Sp,Cx	1		
	2		47.69	S	80	140	Cl,Cx,T	1		
	6		48.05	J	10	<1	Cl,T,Ca	1		
	6		48.37	S	40	1	Cl,Cx,T	1		
			48.58	J	40	1	Cl,Sp	6		
	6		48.75	J	60	1	Qtz	18		
	2									
	6		49.36	J	70	30	Ca	3		
			49.49	J	15	1	Ca	1		
	1		49.55	J	80	30	Ca	6		
			49.61	J	50	5	Ca	18		
	4		49.69	J	50	10	Ca	18		
			49.79	J	40	3	N	18		
	2		49.92	J	30	1	Py	18		
			50.14	J	20	-	Ca,Gy	3		
			51.90	S	55	>200	Cl,Sp,Cx	1		
			52.17	J	50	3	Ca	18		
			52.24	J	50	1	Ca	18		
			52.31	J	55	2	N	14	PT2	
	6		52.44	S	10	60	Cl,Cx,Ca,T	1	3 x 10-7	
	4									
	6		53.11	J	40	5	Ca,Qtz	3		
			53.17	J	35	5	Ca,Cl	1		
	6		53.20	S	45	300	Cl,T,Sp,Cx	1		
			53.62	J	40	30	Cl,Sp,Cx	1		
	6		53.75	J	50	20	Cl,Cx,Sp	1		
			53.85	J	80	30	Cl,Cx,Sp	1		
	6									
			54.21	J	35	300	Cl,Cx,Sp	1		
	6									
	6									
			54.92	J	60	10	Sp,Ca,Cl	3		
	6									

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None FeOx: Iron Cl: Clay Ca: Calcite Qtz: Quartz NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh HW: Highly SW: Slightly CW: Completely MW: Moderately RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 5: Rough Undulating, Stepped 3: Slightly Rough, Undulating 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-108

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m)	RUN LENGTH (m)	TCR (%)	RQD (%)	SCR (%)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS
			5 10 15		25 50 75	25 50 75	25 50 75				(continued from previous page)	
	53	14/15		1.50	87	29	89	S3-R1	F		55.11 m to 55.26 m: Shear zone, clayey gouge and crushed rock, slickensided fracture surfaces, serpentinite and calcite infill	before this run. Clean angular gravel out of top of run
56								R3-R4	F		Fine to medium grained, dark greenish grey, weakly altered, moderately strong, microfracturing still slightly present	
								R3-R4	F			
								R3-R4	F			
	54	15/16		1.50	100	69	90	R3-R4	F		56.36 m to 56.37 m: Fault, broken rock and calcite, chlorite, clayey gouge and serpentinite infill	
57											56.52 m: 2 mm fault, broken and crushed rock, clayey gouge, chlorite and serpentinite infill	
								R3-R4	F		56.57 m: 5 mm calcite vein at 24 degrees	
								R3-R4	F			
	55	16		0.46	74	17	17	R3	F		57.31 m to 57.33 m: Fault, clayey gouge, broken and crushed rock,serpentinite, talc and chlorite infill	Drillers drilled 0.46 m without a tube to retrieve PVC down hole, core dropped out of rods when pulling rods, not logged for discontinuity data
58								R3	F			
	56	16/17		1.04	100	80	100					
								R3	F			
								R3	F			
											59.0 842.4 Fine grained, dark greenish grey, moderately altered 10 mm calcite vein at 45°C	
59								R4	F			
											Fine to medium grained, dark greenish grey, medium strong, weakly altered, 1 to 4 mm calcite veins, predominantly oriented at 35° and 55°	
	57	17		1.50	100	96	96					
60											60.5 840.9 Fine grained, dark greenish grey, weak, weakly to moderately altered	
								R3-R3.5	F			
61												
	58	18		1.50	100	76	94					
62								R3	F			
								R3	F		1 mm pyrite stringers/blebs observed	
	59	18/19		1.50	100	62	85					
63												
								R3	F		63.19 m to 63.24 m: Fault/shear zone, broken and crushed rock, serpentinite, calcite, talc (?) and chlorite infill	
								R3	F			
								R3	F		63.38 m to 63.43 m: Fault/shear zone, broken and crushed rock, serpentinite, calcite, chlorite and talc (?) infill	
64												
	60	19/20		1.50	98	83	83					

INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm)	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
	2 4									
	6		55.18	S	25	15	Cl,Sp,Ca,Cx	1		
			55.33	S	30	15	Sp,Cx,Cl	18		
	6		55.43	S	30	30	Sp,Cx,Cl	1		
			55.58	S	30	10	Cl,Sp	3		
	6		55.68	J	55	1	Sp, Ca	10		
			55.85	J	65	1	Sp	14		
	1		56.11	J	58	2	Sp, Cl	2		
			56.22	J	47	>3	Chl, Sp	10		
	3		56.29	J	51	3	Sp, Chl	8		
			56.31	J	36	<1	Sp, Chl	10		
	6		56.36	F	33	10	Bx, Ca, Chl, Sp	4		
			56.38	J	45	1	Cl	3		
			56.40	J	50	1	Sp, Chl	3		
	1		56.42	J	53	1	Sp, Chl, Cl	1		
			56.48	J	58	1	Sp, Chl, Cl	2		
	3		56.52	F	66	80	Bx, Cx, Cl, Sp, Chl	4		
			56.57	V	24	5	Ca, Chl, T, Cl, Sp	3		
	4		56.77	J	39	2	Sp, Chl, Cl, T, Ca	3		
			56.96	J	76	1	Ca, Sp	14		
			57.04	J	26	<1	Sp, Ca, Chl	10		
			57.09	J	54	3	Ca, Cl, Sp, Chl	3		
			57.17	J	43	4	Sp, Chl	3		
			57.31	F/S	47	20	Cl, Bx, Cx	10		
	1		57.33	F/S	51	20	Cl, Bx, Cx	10		
			57.49	J	56	>3	Sp, Chl, T	3		
	6		58.16	J	59	1	Sp, Ch, T	10		
			58.61	J	58	2	Ch, Sp, T, Ca	3		
			58.62	J	49	1	Sp, Cl	10		
	3		58.63	J	30	2	Sp, Chl	3		
			58.66	J	36	>3	Sp, Chl	10		
			58.69	J	35	1	Sp, Chl	3		
			58.70	J	72	1	Sp, Chl	3		
	1		58.87	J	65	<1	Sp, Chl	2		
			58.91	J	87	<1	Sp, Chl	6		
			58.93	J	43	>3	Cl, Sp, Chl	10		
			59.06	J	27	>3	Chl, Sp	12		
			59.08	J	75	1	Chl, Sp, Bx	10		
			59.44	J	69	>3	Sp, T, Chl	10		
	2		60.46	J	62	>3	Sp, Chl, T	4		
			60.50	J	82	10	Sp, T, Chl	3		
	1		60.67	J	32	4	Sp, T, Chl	10		
			60.85	J	41	<1	Sp, T, Chl	1		
	2		61.09	J	37	<1	Sp, Chl	10		
			61.12	J	86		Sp, T, Chl	3		
	1		61.51	J	85	2	Sp, Ca	18		
			61.55	J	24	1	Cl, Sp	2		
	6		61.59	F	89	40	Bx, Sp, Cl, T	3		
			61.63	F	44	3	Sp, T, Chl	10		
	5		61.80	J	74	2	Sp, T	10		
			61.84	J	50	1	Ca, T, Sp, Chl	4		
			61.89	V	67	>3	Ca, Sp, T, Chl	1		
	1		61.95	J	69	1	Ca, Sp, T	3		
			62.00	J	55	2	Ca, Sp	3		
	4		62.28	J	62	<1	Sp	4		
			62.49	J	45	1.5	Sp	3		
	3		62.54	J	34	1	Sp	4		
			62.55	J	46	>3	Sp	3		
	4		62.60	J	48	<1	Sp, Ca, T	1		
			62.66	V	67	3	Sp	2		
	6		62.86	J	66	>3	Sp	4		
			62.89	J	24	50	Sp, Ca, T	3		
	1		63.03	V	64	50	Sp, Ca	10		
			63.18	J	47	Bs 3	Sp, Ca, Cx, T, Chl	3		
	2		63.19	F/S	63	Bx 1	Cx, Sp, Ca, Chl	6, T		
			63.24	F/S	87	4	Sp, Ca	10		
	1		63.38	J	74	<1	Sp, Ca	14		
			63.43	J	80	5	Sp, Ca	12		

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:

DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack

INFILL TYPE: N: None Cl: Clay Qtz: Quartz FeOx: Iron Ca: Calcite NC: Non-Cohesive

ROCK MASS WEATHERING: F: Fresh SW: Slightly MW: Moderately HW: Highly CW: Completely RS: Residual Soil

JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 3: Slightly Rough, Undulating 5: Rough Undulating, Stepped 6: Very Rough, Stepped

HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-108

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m)	RUN LENGTH (m)	TCR (%)	RQD (%)	SCR (%)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS	INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm)	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
			5 10 15		25 50 75	25 50 75	25 50 75				(continued from previous page)			2 4									
65											65.0 836.4					63.73	J	70		T, Sp, Ca	3		
								R2	F		Calcite veins at 60° to 70°, some hatched fractures infilled with clayey gouge.			1		63.82	J	45		T, Sp, Ca	10		
								R3	F		65.00 m to 65.17 m: Broken zone, fractured rock.					64.06	J	45			10		
																64.25	J	70			10		
														6		64.70	J	80	5	T, Sp, Ca	3		
	61	20		1.50	93	65	71									65.28	J	80	1	Sp, Ca	1		
																65.47		30			1		
														2		65.75	J	80	20	T, Sp, Ca	1		
66														2									
																66.19	J	70	20	Ca, Sp	1		
														1									
								R2-R3	F							66.51	J	75	20	Cl, Sp, Cx	6		
																66.87	J	65	3	Ca	3		
67																66.98	J	50	2	Ca, Cl	3		
	62	20/21		1.50	99	67	78							2									
																67.54	J	25	20	Ca, Sp	10		
														1		67.77	S	25	20	Cx, Ca, T	1		
68								R2-R3	F					1									
	63	21/22		1.50	100	99	86																
69																69.16	J	60	3	Cl	18		
														1		69.34	J	40	3	Ca, Sp	10		
																69.42	J	10		Ca, Sp	3		
								R2-R3	F					2		69.58	J	20	2	Ca, Sp	3		
																69.79	J	45	1	Ca, Sp	3		
70														2		69.80	J	55	1	Ca, Sp	3		
	64	22		1.50	100	70	100									70.09	J	65	1	Ca	3		
																70.43	J	65	1	Ca	3		
														1		70.50	J	65	1	Ca, Sp	10		
																70.59	J	45	2	Ca, Sp	10		
														3		70.71	J	70	2	Ca, Sp	3		
71								R2-R3	F			Pulled bit up to 59.00 m after this run and conducted air lift and packer tests				70.87	J	80	3	Ca, Sp	1		
														3		70.98	J	80	1	Ca, Sp	1		
																71.08	J	75	5	Sp, Ch	1		
														3		71.20	J	60	3	Sp, Ca	3		
	65	22/23		1.50	100	59	81									71.24	J	65	<1	Sp, Ca	3		
																71.41	J	55	5	Sp, Ca	1		
72														2		71.54	J	50	20	Ca, Sp, Cx	10		
								R2-R3	F		71.90 m to 72.10 m: Shear zone, clayey gouge and crushed rock, calcite and serpentinite infill, smooth and wavy to stepped fracture surfaces					71.69	J	40	1	Ca, Sp	1		
																71.85	J	75	2	Ca, Sp	1		
														1		71.90	S	25	200	Ca, Sp, Cl, Cx	10		
								R2-R3	F							72.56	J	76	<1	Ca, Sp	8		
																72.63	V	45	1	Ca, Sp	3		
																72.72	V	61	2	Ca, Sp	8		
73														5		72.79	J	25	1	Ca, Sp	4	PT4	
	66	23/24		1.50	100	29	77									72.84	J	85	1	Ca, Sp, T	4	7 x 10-9	
														4		72.88	J	77	1	Ca, Sp	10		
																72.90	V	48	1.5	Ca, Sp	5		
														4		72.99	V	51	<1	Ca, Sp	5		
																73.13	V	59	3	Ca, Sp	3		
														4		73.27	V	33	<1	Ca, Sp	3		
74								R2-R3	F		73.75 m to 73.76 m: Fault/shear zone, broken rock, calcite, serpentinite and chlorite infill					73.33	J	29	1	Ca, Sp	8		
								R2-R3	F							73.51	J	38	1	Chl, Sp, T	6		
								R2-R3	F		73.81 m: 10 mm fault, crushed and broken rock,	Aperture unknown		4		73.53	J	82	1	Chl, Sp	4		

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None Cl: Clay Qtz: Quartz FeOx: Iron Ca: Calcite NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh SW: Slightly MW: Moderately HW: Highly CW: Completely RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 3: Slightly Rough, Undulating 5: Rough Undulating, Stepped 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-108

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m) (5 10 15)	RUN LENGTH (m)	TCR (%) (25 50 75)	RQD (%) (25 50 75)	SCR (%) (25 50 75)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS	INSTRUMENT DETAILS
											(continued from previous page)		
75	67	24/25		1.50	100	50	71	R2-R3	F		clayey gouge, serpentinite and chlorite infill 73.88 m: 3 mm fault, crushed and broken rock, clayey gouge, serpentinite, and chlorite infill 74.74 m: 10 mm fault, clay, serpentinite and chlorite infill 75.11 m: 5 mm fault, clayey gouge, serpentinite, chlorite and calcite infill	as core was disturbed when removing from tube. Aperture unknown as taken out of tube, not same fracture at split	
								R2-R3	F				
								R2	F		75.5 825.9		
76	68	25		1.50	100	55	78	R2	F		Fine to medium grained, dark greenish grey, weak, weakly to moderately altered 75.82 m: 4 mm fault, clayey gouge, chlorite, serpentinite, and talc (?) infill on a chlorite vein 76.02 m to 76.44 m: Shear zone/highly altered zone, crushed/broken/altered rock cemented with clayey gouge		
								R2	F				
77								R2	F				
								R2	R		76.83 m: 2 mm fault, serpentinite, chlorite and calcite infill 76.93 m: Fault/shear zone, serpentinite, calcite, chlorite and crushed rock infill		
78	69	26		1.50	100	50	86	R2	R		77.95 m: 4 mm fault, broken and crushed rock, clayey gouge, serpentinite and calcite infill		
								R2	R		78.43 m to 78.50 m: Increased alteration, rubble (likely due to handling), serpentinite, calcite and chlorite on fracture surfaces 78.63 m to 79.37 m: Abundant healed fractures infilled with clayey gouge, serpentinite, calcite and talc (?), aperture ranges from <1 mm to 5 mm, majorite of fractures are subvertical at 10° to 20° 79.37 m to 80.00 m: Fractures are not healed, infilled with talc (?), serpentinite, chlorite and calcite		
								R4	F				
79								R4	F				
	70	26/27		1.50	87	9	15	R4	F				
80								R2-R3	F				
	71	27/28		1.50	97	61	69						
81													
								R4	F		Massive and strong		
82	72	28		1.50	100	85	100						
83								R4	F				
	73	28/29		1.50	95	76	87						

DISCONTINUITY DATA

FRACTURE FREQ. (No. Per 30 cm) (2 4)	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
2		73.55	V	82	1	Sp, Chl	4		
3		73.65	V	30	2	Ca, Sp, Chl	10		
		73.75	F/S	83	<1	Ca, Sp, Chl	12		
		73.76	F	29	5	Bx, Ca, Chl, Sp	12		
4		73.81	F	48	10	Ca, Cl, Sp, Chl, Bx	12		
		73.88	F	82	3	Bx, Cl, Sp, Chl, Bx	10		
4		74.24	J	85	>3	Sp, Chl, T	4		
		74.26	V	52	<1	Sp, Cl, Chl, T, Ca	8		
3		74.31	J/V	58	1	Sp, Chl, Ca	8		
		74.37	J	65	10	Sp, Chl, Ca	1		
		74.40	J	46	>3	Sp, Chl	3		
		74.67	J	59	5	Sp, Chl	3		
		74.74	F/S	73	>1	Cl, Sp, T, Chl	4		
3		74.79	J	56	4	Sp, Chl	10		
		74.88	J	63	>3	Sp, Chl, T	3		
6		74.98	J	54	1.5	Sp, Chl	3		
		75.02	J	70	2	Sp, Chl	3		
		75.08	J	68	>3	Sp, Chl	3		
1		75.11	F	38	>3	Cl, SP, Chl, Ca	1		
6		75.27	J	74	>3	Sp, Chl	10		
		75.36	J	52	>3	Sp, Chl, T	1		
		75.50	J	70	2	Ca, Sp, Cl	3		
2		75.82	F	75	2	T, Chl, Sp, Cl	10		
		75.88	J	84	2	T, Chl, Sp, Cl	10		
4		75.99	V	59	10	Sp, Ca, Chl	4		
		76.14	F/S	49	0.5	Sp, Chl, Cx, Bx	8		
1		76.44	F/S	45	0.5	Cl, Sp, Chl, Cx, Bx	8		
		76.63	J	63	<1	Cl, Sp, Chl, T	3		
3		76.72	J	32	>3	Sp, Chl, Ca	10		
		76.73	J	10	4	Sp, Chl, Ca	10		
3		76.76	J	25	1	Sp, Chl, Ca	10		
		76.78	F/V	76	1	Sp, Chl, T	8		
1		76.83	F/S	83	2	Sp, Chl, Ca	18		
		76.93	J	87	>3	Sp, Chl, Ca, Cx	12		
1		77.09	J	72	>3	Ca, Sp	10		
		77.20	J	86	90	Sp, Ca	3		
		77.47	J	67	<1	Sp, Chl	3		
		77.52	J	44		Sp, Ca, Chl	5		
		77.54	J	5		Sp, Chl	10		
6		77.59	J	74		Sp, Ca, Chl	3		
		77.89	F	84		Sp, Ca	3		
6		77.95	J/V	81		Bx, Cl, Sp, Ca, Cx	12		
		78.00	J	70	1	Ca, SP, Chl, T	10		
1		78.14	V/J	23	170	Bx, Sp, Ca, Chl	8		
		78.27	J	31		Sp, Ca, Chl	4		
1		78.35	J	35		Sp, Ca, Chl	3		
		78.37	S	84	1	Sp, Chl, Ca, T	18		
1		78.68	J	25	100	Cx, Sp	10		
		79.03	J	50		T, Sp	10		
6		80.27	S	80	30	N	1		
		80.45	J	30	3	Cl, Cx, Sp	1		
2		80.83	S	50	1	Sp	3		
		81.03	J	60		Cl, Cx, Sp	10		
1		81.24	J	80		Sp	10		
		81.32	J	40		Sp			
		81.59	J	50	1	T, Sp	3		
		82.22		70		T, Sp			
1		82.58	J	50	1	Sp	6		
1		82.90	J	60	1	Sp	3		
1		83.12	J	65	1	N	18		
		83.21	J	35	1	Sp, T	10		
3		83.29	J	25		Sp, Ca	10		

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None Cl: Clay Qtz: Quartz FeOx: Iron Ca: Calcite NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh SW: Slightly MW: Moderately HW: Highly CW: Completely RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 3: Slightly Rough, Undulating 5: Rough Undulating, Stepped 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-108

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m)	RUN LENGTH (m)	TCR (%)	RQD (%)	SCR (%)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS	INSTRUMENT DETAILS
			5 10 15		25 50 75	25 50 75	25 50 75				(continued from previous page)		
84								R4	F		84.17 m to 84.19 m: Shear zone, clayey gouge and rock infill, serpentinite and talc present		
								R4	F				
85	74	29/30		1.50	97	53	65	R1	F		85.02 m to 85.16 m: Healed fractures, infilled with clayey gouge, serpentinite, and talc, falls apart in hands		
86								R4	F				
	75	30		1.50	100	80	97						
87								R4	F				
88								S4-R1	F		87.85 m to 88.26 m: Shear zone, subvertical, fractured rock and clayey gouge, serpentinite calcite and talc infill		
	76	31		1.50	99	21	43						
89								R2-R3	F				
	77	31/32		1.50	90	57	79						
90								R2-R3	F		90.26 m: Fault with calcite, clayey gouge and crushed rock infill		
								R2-R3	F				
91	78	32		1.50	100	71	97						
								R2-R3	F		91.68 m: 2 mm fault with clayey gouge, calcite, chlorite and serpentinite infill		
92								R2-R3	F				
	79	33		1.50	100	86	87	R2-R3	F		92.64 m: 5 mm fault with clayey gouge, crushed rock, chlorite and serpentinite infill		
93													

DISCONTINUITY DATA

FRACTURE FREQ. (No. Per 30 cm)	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)
2 4							
1		84.19	S	60	40	Cl, Cx, Sp, T	3
1		84.60	J	50		Cx, Sp	14
1		84.94	J	25	<1	Sp	10
1		85.12	S	20	140	T, Sp, Cl, Cx	10
1		85.30	J	50	10	Sp, Cx	10
3		85.37	J	60	5	Sp, Ca	10
3		85.54	J	60	3	Sp, Ca, T	3
1		85.77	J	30	3	Sp, T	10
1		85.85	J	30	1	Sp, Ca	10
2		86.17	J	70	3	Sp, Cl	3
2		86.27	J	40	3	Ca	14
2		86.35	J	35	2	Sp, Ca	10
2		86.54	J	60	2	Sp, Ca	3
1		86.89	J	55	5	Cl, T, Sp	3
1		87.25	J	60	5	Cl, T, Sp	3
4		87.44	J	35	3	Cl, Sp	3
4		87.49	J	75	2	Sp, Ca	3
4		87.50	J	25	1	Sp, Ca	10
3		87.54	J	60	1	Sp, Ch	3
3		87.61	J	35	1	Ch, Cl	3
6		87.79	J	20	4	Cl, Ca, T	3
6		87.84	J	50	1	Cl, Ch	14
6		88.04	S	5	240	Ca, T, Cl, Cx, Sp	3
6		88.84	J	60	3	Cl, Ch	10
6		88.89	J	80	1	N	6
3		88.94	J	60	1	Ca	6
3		89.33	J	56	1	Ca	3
3		89.40	J	45	1	Ca, T	10
3		89.53	J	30	3	Ca, Cl	3
3		89.72	J	57	1.5	Ca	3
3		89.73	J	63	<1	N	3
3		89.77	J	36	1	Ca	3
3		89.89	J	60	4	Ca, Ch, Cl	4
1		90.19	J	35	1.5	Ca	3
1		90.26	F/J	25		Ca, Cl, Cx	3
2		90.58	V	5	5	Ca	3
2		90.59	J/F	7	1	Cl, Cx, Ch	10
4		90.66	F/S	44	4	Cl, Cx, Ch	10
4		90.74	F/S	65	14	Cx, Bx, Cl, Chl	3
3		90.98	F/S	52	3	Chl	10
3		91.06	J	39	5	Ch, Sp, Ca	3
3		91.09	J	40	<1	Ch, Ca	10
3		91.49	J	56	1	Sp	10
3		91.58	J	58	2	Ch, Sp, Ca	18
6		91.62	J	5	1	Sp	3
1		91.63	J	45	1	Sp	3
1		91.65	J	42	1	Ca, Ch, Sp	3
2		91.68	F	56	2	Cl, Ca, Chl, Sp	3
3		92.03	J	75	4	Cx, Ca, Chl, Sp	10
1		92.14	J	62	2	Ca, Sp	8
1		92.18	J	30	10	Ca, Sp	4
1		92.30	J	29	10	Ca, Sp	3
2		92.48	J	29	5	Ca, Sp	3
		92.61	F	59	15	Cl, Cx, Sp, Chl	4
		92.82	J	79		Sp, Ca	10

PERMEABILITY (m/sec)	SAMPLE RETAINED
PT5 4 x 10-9	

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None Cl: Clay Qtz: Quartz FeOx: Iron Ca: Calcite NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh SW: Slightly MW: Moderately HW: Highly CW: Completely RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 3: Slightly Rough, Undulating 5: Rough Undulating, Stepped 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-108

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m)	RUN LENGTH (m)	TCR (%)	RQD (%)	SCR (%)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS
			5 10 15		25 50 75	25 50 75	25 50 75				(continued from previous page)	
94	80	33/34		1.50	100	57	86	R2-R3	F		93.35 m to 93.50 m: Core fractured mechanically due to being hammered out of core lifter case/spring	
								R2-R3	F			
								R2-R3	F		93.59 m to 93.87 m: Shear zone, crushed and broken rock, long subvertical fractures with short subhorizontal cross fractures	
								R2-R3	F			
95								R2-R3	F		94.62 m to 94.80 m: Shear/fault zone	
								R2-R3	F		94.80 m: 11 mm fault with clayey gouge, serpentinite, chlorite, calcite and talc (?)	
	81	34/35		1.50	100	55	83					
96												
								R2-R3	F		96.30 m to 96.37 m: Shear/fault zone, clayey gouge, broken and crushed rock, calcite, chlorite, and talc (?) infill	
								R2-R3	F			
								R2-R3	F			
97								R2-R3	F		96.50 m: 5 mm fault, clay, talc (?), calcite and serpentinite infill	
	82	35/36		1.50	100	77	95				96.50 m to 96.85 m: Long vertical joint/fracture	
											96.51 m: 10 mm fault, clayey gouge, calcite and serpentinite infill	
								R3-R4	F			
98								R4	F		97.62 m: Picrite becomes more competent and less fractured	
											98.0 / 803.4	
	83	36		1.50	100	100	100				Dark grey, fine grained, weakly altered, medium strong	
99												
								R3	F		99.50 m to 100.05 m: Healed fractures infilled with clayey gouge, aperture less than 1 mm	
100	84	36/37		1.50	100	92	100	R4	F		100.05 m to 101.00 m: Becomes strong and massive	
								R4	F			
101												
	85	37/38		1.50	90	41	61					
102								R4	F		102.00 m to 102.50 m: Becomes fractured	
								R2-R3	F		102.50 m to 102.80 m: Fractured	
								R2-R3	F		102.80 m to 103.70 m: Massive with some healed	

INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm)	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
	2 4									
	1		93.35	J	60	Sp	Ca, T, Chl	3		
			93.65	J	25	1	Sp, Ca, Chl	3		
	6		93.69	J	13	<1	Sp, Ca, Chl	10		
			93.70	J	45	3	Sp, Ca	3		
			93.76	F/S	45	Bx	Cl, Cx, Sp, Ca, Chl	3		
	2		93.84	J	14	3	Ca, Chl, T, Cl, Sp	3		
			93.99	J/V	33	2	Chl, Sp, Ca, T	3		
	4		94.13	F/S	27	30	Cl, Bx, Cx	10		
			94.16	F/S	35	1.5	Ca, Sp	18		
	6		94.26	J	47	180	Chl, Sp	10		
			94.62	F/S	59	Cl	Bx, Cx, Ca, Chl	3		
			94.80	F/S	26		Sp, Chl	10		
	3		94.85	J	29	Sp	Ca, T, Chl	10		
			94.98	J	26	Bx	Sp, Chl, Ca, T	3		
			95.42	F	26			10		
	1		95.65	J	22	2	Sp, Chl, T, Ca	3		
			95.78	J	40	1	Sp, Ca, Chl, T	3		
			95.90	J	55	2	Sp, Ca, Chl, T	10		
	4		96.00	J	39	4	Sp, Ca, Chl	18		
			96.12	J	59	1	Sp, Ca, T	8		
	3		96.16	J	60	<1	Sp, Ca	10		
			96.24	J	59	<1	Sp, Ca, T	14		
	6		96.30	J	62	Cl	T, Chl, Cl, Bx, Cx	10		
			96.37	F/S	50	5	Cl, T, Ca, Sp	18		
			96.50	F	55	5	Cl, T, Ca, Sp	10		
			96.51	F/J	54	10	Cl, Ca, Sp	10		
			96.70	J/V	0	1	Ca, Sp, T, Chl	10		
			96.72	J	70	1	Sp, T, Ca, Chl	3		
	3		96.77	J/V	5	1.5	Ca, Sp, T	3		
			96.89	J	24	1	Sp	10		
	1		97.08	J	79	>1	Ca, Sp	18		
			97.39	J	63	2	Ca, Chl	18		
			97.52	F/J	61	Cl	Sp, Ca, Chl, T	10		
			97.62	J	54	3	Sp, T, Chl	4		
			97.67	J	92	10	Sp, Chl, T	10		
			97.86	V	27	2.5	Ca, Chl, Sp	4		
			98.82	J	82	1	Ca, Chl, Sp	10		
	1		99.18	J	61	3	Chl, Sp	4		
	1		99.40	J	62	5	Chl, Sp, T	4		
	1									
			100.06	J	45	1	Ca	3		
	1		100.26	J	30	2	T, Sp	10		
	1									
			100.65	J	65	3	T, Sp	3		
	1		100.69	J	65	<1	T, Sp	3		
			100.98	J	70	1	T, Sp	3		
	2		101.18	J	70	1	Sp, Ca	3		
			101.29	J	70	1	Sp, Ca	14		
	3		101.33	J	45	3	Sp	6		
			101.42	J	40	<1	T, Sp	3		
	3		101.47	J	70	1	Sp, Ca	3		
			101.59	J	65	3	Sp, Ca	3		
	3		101.63	J	50	2	Sp, Ca	10		
			101.86	J	65	1	Sp, Ca	1		
	6		101.90	J	80	1	Ca, Sp	3		
			102.25	J	15	1	Ca, Sp	10		
	2		102.40	J	60	1	Ca, Sp	3		
			102.82	J	70	1	Sp	3		
	6		102.85	J	70	1	T, Sp	3		

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None Cl: Clay Qtz: Quartz FeOx: Iron Ca: Calcite NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh SW: Slightly MW: Moderately HW: Highly CW: Completely RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 3: Slightly Rough, Undulating 5: Rough Undulating, Stepped 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-108

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m)	RUN LENGTH (m)	TCR (%)	RQD (%)	SCR (%)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS	INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm)	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
			5 10 15		25 50 75	25 50 75	25 50 75				(continued from previous page)			2 4									
	86	38		1.50	97	46	80				fractures					102.96	J	70	1	Ca, Sp	3		
														3		103.14	J	65	1	T, Sp	3		
																103.55	J	70	1	Sp	3		
														1		103.56	J	70	1	Sp	6		
								R2-R3	F		103.70 m to 104.00 m: Fractured, possibly from being taken out of lifter case					103.58	J	60	1	Cl, Sp	6		
104														4		103.68	J	45	2	Cl, Sp	6		
								R4	F		Strong, calcite veins, healed fractures infilled with clayey gouge			6		103.87	J	<1	<1	Sp, T	3		
	87	39		1.50	97	81	95									104.55	J	50	1	Ca, Sp, T	10		
														2		104.58	J	50	1	Cl, Sp	14		
105																105.04	J	10		T, Cl, Sp, Ca	3		
																105.31	J	60	10	Cl, Ca, Sp	6		
														1		105.42	J	70	<1	Cl, Ca, Sp	6		
								R3	F							105.47	J	30	50	Ca, T	14		
														3		105.65	J	80		Cl, Cx, Sp	6		
106														1									
	88	39/40		1.50	94	80	80	R3	F		106.23 m to 105.70 m: Healed fractures infilled with clayey gouge, aperture <1 mm to 3 mm					106.23	J	85	5	Cl, Cx, Sp	6		
														1		106.70	J	45	30	Cl, Sx, Sp	14	PT6	
107								R4	F		107.00 m to 107.10 m: Fractured zone, broken rock with serpentinite infill					106.87	J	45		Cl, Sp	3	2 x 10-8	
														2		107.32	J	40	40	Ca, Sp	6		
	89	40/41		1.50	100	76	82							6		107.41	J	10	10	Sp	6		
108														2		107.87	J	1	1	Sp	10		
														1									
								R3	F							108.42	J	60	60	Sp, T	3		
																108.49	J	80	1	Sp, T	4		
														4		108.50	J	80	3	Sp, T	6		
																108.59	J	55	20	Ca	1		
109														3		108.62	J	15	2	Ca	1		
	90	40/41		1.50	100	21	65	R3	F		109.00 m to 110.00 m: Fractured rock, two joint sets, first at 60°, spacing 30 mm to 100 mm, aperture 1 mm to 3 mm, clayey gouge and calcite infill, second set at 20°, aperture 1 mm, clayey gouge and calcite infill					108.69	S	50	2Cx	Cl, Ca, Sp	3		
														2		108.94	J			Ca	14		
																109.00	J			Ca, Sp	6		
110														6									
								R2	F		110.00 m to 110.13 m: Fractured rock, crushed rock with clayey gouge, calcite and serpentinite			6									
														6									
														6		110.44	J	60	3	Sp, Ca	6		
	91	42		1.50	90	51	65									110.47	J	70	1	Sp, Ca	6		
														2		110.75	J	70	2	Sp, Ca	3		
111																111.00	J	35	1	Cl, Sp	3		
														1		111.09	J	75	10	Cl, Cx, Sp	3		
								R2	F					2									
								R3	F		111.33 m to 111.50 m: Fractured rock with clayey gouge												
								S4-R1	F		111.80 m to 112.14 m: Shear zone, crushed rock with clayey gouge infill, calcite and serpentinite			6									
112																111.90	S	45	340	Cl, Cx, Sp, Ca	1		
	92	42/43		1.50	100	44	52							1		112.27	J	50	1	Cl, Ca	6		
																112.32	J	50	1	Cl, Sp	3		
														3		112.41	J	55	1	Ca, Sp	3		

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None Cl: Clay Qtz: Quartz FeOx: Iron Ca: Calcite NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh SW: Slightly MW: Moderately HW: Highly CW: Completely RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 3: Slightly Rough, Undulating 5: Rough Undulating, Stepped 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-108

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m)	RUN LENGTH (m)	TCR (%)	RQD (%)	SCR (%)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS
			5 10 15		25 50 75	25 50 75	25 50 75				(continued from previous page)	
113								S4-R1	F		112.90 m to 113.00 m: Shear zone, crushed rock with clayey infill, calcite and serpentinite	
								S4-R1	F			
								R2	F		Shear zone at 112.90 m continues to 113.30 m	
	93	43		1.50	97	27	46				Jointed, joints at 60° and 20°, infilled with clayey gouge, serpentinite and calcite	
114												
								R3	F			
115	94	44		1.50	100	69	71					
116								S4	F		115.93 m to 116.78 m: Fractured zone, angular rock fragments	
								R3	F			
	95	44/45		1.50	93	54	77	R3	F		116.64 m to 116.78 m: Fractured zone, angular rock fragments	
117												
								R3	F			
118	96	45/46		1.50	95	65	77					
119								R3	F		119.00 m to 119.30 m: Shear zone, crushed rock, clear to trace clayey coating	
								R0	F			
	97	46		1.50	98	56	65					
120												
								R0	F		120.27 m to 120.50 m: Shear zone, crushed rock and clayey gouge, serpentinite and calcite infill	
								R3	F			
121	98	46/47		1.50	95	70	75					
122								R3	F			

INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm)	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
	2 4									
	1		112.67	J	45	1	Sp, Cl	3		
			112.77	J	30	5	Sp, Ca	3		
	4		112.78	J	50	1	Sp, Ca	3		
			112.90	S	20	>50	Cl, Cx, Sp, Ca	1		
	1		113.20	S	20	300	Cl, Cx, Sp, Ca	1		
	1		113.47	J	25	1	Cl, Sp	10		
	6									
	6		114.30	J	65	1	Ca, Sp	10		
			114.35	J	15	1	Ca, Sp	10		
	2		114.66	J	35	1	Cl, Ca	10		
			114.78	J	35	1	Cl, Ca	10		
	1		114.90	J	75	3	Sp, Ca	6		
			115.00	J	30	1	Cl, Ca, Sp	10		
	3		115.21	J	65	10	Cl, Ca, Sp	6		
			115.45	J	25	<1	Cl, Ca, Sp	10		
	1		115.55	J	25	<1	Cl, Ca, Sp	10		
			115.66	J	35	<1	Cl, Ca, Sp	10		
	3		115.68	J	65	<1	Ca, Sp	10		
			115.83	J	0	3	Cl, Ca, Sp	3		
	3		115.93	S	40	>100	Cl, Ca, Sp, Cx	3		
			116.40	J	45	3	Ca	3		
			116.56	J	70	<1	Ca, Sp	10		
	2									
	6		116.99	J	70	1	Ca, Sp	3		
			117.12	J	70	<1	Ca	3		
	3		117.18	J	70	5	Ca, Sp	3		
			117.23	J	60	<1	Ca, Sp	14		
	2		117.35	J	50	<1	Ca	14		
			117.91	J	75	1	Ca, Sp	3		
	1		118.18	J	75	3	Cl, Sp	3		
			118.28	J	45	1	Sp, Ca	6		
			118.40	J	35	4	Cl, Ca, Sp	1		
	2		118.59	J	70	1	Sp, Ca	3		
			118.76	J	40	3	Cl, Ca, Sp	3		
	2		118.82	J	70	2	Sp, Ca	3		
			118.86	J	45	1	Sp, Ca	10		
	6									
			119.34	J	90	1	Ca, Sp	3		
	6									
			119.63	J	70	<1	Ca, Sp	3		
	1		119.75	J	70	1	Ca	1		
			119.93	J	80	1	Ca, Sp	3		
	2									
	1									
	6		120.70	J	60	40	Cx, Sp	1		
			120.77	J	75	3	Cl, Sp	3		
	2		120.93	J	55	1	T, Sp	4		
			121.11	J	70	<1	Ca, Sp, T	3		
	2		121.32	J	80	<1	T, Sp	1		
			121.36	J	80	<1	T, Sp	13		
	2		121.41	J	15	1	T, Sp	6		
			121.57	J	70	<1	Ca, Sp	14		
	3		121.60	J	55	<1	T, Sp	14		
			121.84	J	85	1	T, Sp	3		
	1									

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None Cl: Clay Qtz: Quartz FeOx: Iron Ca: Calcite NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh SW: Slightly MW: Moderately HW: Highly CW: Completely RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 3: Slightly Rough, Undulating 5: Rough Undulating, Stepped 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-108

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m) 5 10 15	RUN LENGTH (m)	TCR (%) 25 50 75	RQD (%) 25 50 75	SCR (%) 25 50 75	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS	INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm) 2 4	DISCONTINUITY DATA: FRACTURE ZONE	DISCONTINUITY DATA: DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
											(continued from previous page)												
123	99	47/48		1.50	95	45	59	R3 R3	F F		122.54 m to 122.75 m: Shear zone, fractured rock with clayey gouge, calcite and serpentinite infill 122.96 m to 123.06 m: Shear zone, crushed rock and clayey gouge, serpentinite and calcite infill			1 1 6		121.88 122.02 122.53 122.65 123.01	J J J S S	0 40 50 50 40	1 1 1 2 1	T, Sp Cl, Ca, Sp Ca, Sp Cx, Cl, Sp, Ca Cx, Cl, Sp, Ca	10 10 10 1 1		
124	100	48		1.50	100	55	58	R3 R0	F F		123.50 m to 123.35 m: Shear zone, crushed rock with clayey gouge, calcite and serpentinite infill			3 3 6 6		123.15 123.19 123.24 123.29 123.33 123.76 124.25	J J J J J S J	70 35 45 65 25 0	1 1 1 1 1 3 1	T, Cl, Sp Ca Ca, Sp Ca Ca Cx, Ca, Sp, Cl Ca, Sp	10 3 6 6 6 1 14		
125	101	49		1.50	95	15	15	R0 S4-R1	F F		124.90 m to 125.00 m: Fractured zone, rock fragments with clayey gouge, calcite and serpentinite infill 125.00 m to 126.07 m: Shear zone, crushed rock with clayey coating, serpentinite, calcite and talc (?) on fracture surfaces			1 3 6 6 6 6 6		124.44 124.57 124.70 124.80 125.00 126.19 126.40	J J J J S J J	0 80 70 30 45 60 60	1 3 10 2 7 60 60	Ca, Sp Cl, Sp Cx, Cl, Sp, Ca Cl, Sp Cx, Cl, Ca, Sp, T Ca, Ch Ca, Sp	14 3 14 10 1 18	PT7 3 x 10-8	
127	102	49/50		1.50	100	85	98	R3	F		126.50 m to 126.94 m: Long subvertical fracture (approximately 14°) with perpendicular micro fracturing (stockwork)			2 2		126.60 126.77 127.33 127.61 127.82 127.84	J J J J J J	14 3 62 60 45 50	<1 1.5 2.5 5 1 <1	Sp, Ca Sp, Ca Sp, Ca Sp, T, Ca Sp, Ca, T Sp, Ca, T	10 10 3 3 10 3		
128	103	50/51		1.50	100	99	100	R3-R4	F		Fine to medium grained, dark grey, weak altered (serpentinite alteration), medium strong rock (R4), average 2 mm quartz veins at 60°			1 4 2 2 2 1 1		127.96 128.02 128.14 128.36 128.54 128.61 128.93 129.25	J J J J V V V V	47 47 51 44 55 25 25 53	1 7 2 1 <1 1 1	Sp, T, Ca Sp, Ca, T Sp Sp Sp Ca Ca Qtz, Sp Qtz	3 3 10 3 3 3 10 73 3		
130	104	51		1.50	100	75	77	R3-R4 R0-R2 R0-R2 R2	F F F F		Fine to medium grained, dark grey, moderately altered (serpentintie alteration), extremely weak to weak, healed fractures infilled with clayey gouge, calcite, and serpentinite 129.50 m to 129.59 m: Shear zone, crushed rock with calcite and serpentinite 130.39 m to 130.43 m: Shear zone, fractured rock with calcite and serpentinite Weak, abundant healed fractures with less than 1 mm aperture and infilled with clayey gouge, calcite and serpentinite			1 6 3 1 1		129.59 129.75 129.80 129.85 130.04 130.41 130.78	S J J J J S J	85 70 30 70 65 25 60	90 1 1 1 1 50 50	Sp, Ca Sp, Ca Sp, Ca Sp, Ca Sp, Ca Sp, Ca, Cx Sp, Ca	3 3 10 14 10 10 14		

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None FeOx: Iron Cl: Clay Ca: Calcite Qtz: Quartz NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh HW: Highly SW: Slightly CW: Completely MW: Moderately RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 5: Rough Undulating, Stepped 3: Slightly Rough, Undulating 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-108

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m)	RUN LENGTH (m)	TCR (%)	RQD (%)	SCR (%)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS	INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm)	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
			5 10 15		25 50 75	25 50 75	25 50 75				(continued from previous page)			2 4									
132	105	52		1.50	96	91	91							1		131.73	J	30	<1	Cl, Ca, Sp	3		
																132.44	J	25	<1	Cl, Ca, Sp	3		
								R2	F		Healed fractures			1		132.68	J	30	10	Sp	3		
																132.84	J	60	3	Sp, Ca	14		
133														1									
	106	52/53		1.50	88	65	72							1		133.18	J	70	3	Sp, Ca	14		
																133.33	J	70	10	Sp, Ca	18		
														2									
																133.69	J	85	5	Sp, Ca	3		
														1		133.74	J	60	1	Sp, Ca	1		
134								R2	F		Healed fractures as above					134.13	S	60	130	Cl, Cx, Ca, Sp	3		
								R2	F		134.07 m to 134.20 m: Shear zone, crushed rock, clayey gouge, calcitte, serpentinite infill			1		134.25	J	55	<1	Ca, Sp	3		
														6		134.45	J	80	1	Ca	10		
	107	53		1.50	97	35	52									134.58	J	80	8	Cl, Ca, Sp	3		
														1		134.61	J	30	<1	Sp	3		
135																134.71	J	45	<1	Ca, Sp	1		
														6		134.73	J	45	<1	Ca, Sp	1		
																134.79	J	45	<1	Ca, Sp	1		
																134.84	J	45	<1	Ca, Sp	1		
														4		134.87	J	45	<1	Ca, Sp	1		
								R2	F		Healed fractures as above					134.92	J	45	<1	Ca, Sp	1		
														6		135.13	J	45	<1	Ca, Sp	1		
136																135.17	J	45	<1	Ca, Sp	1		
														1		135.18	J	60	1	Ca, Sp	1		
	108	54		1.50	100	37	61	S5	F		136.11 m to 136.21 m: Shear zone, clayey gouge, calcite and crushed rock					135.29	J	40	<1	Ca, Sp	10		
								R0	F		136.22 m to 136.26 m: Shear zone, calcite, crushed rock and serpentinite			1		135.71	J	65	1	Ca	3		
																135.83	J	45	2	Ca	3		
														4		136.14	S	65	100	Cl, Ca, Cx	1		
137																136.23	S	70	40	Ca, Cx, Sp	1		
														2		136.35	J	60	1	Ca	1		
								R3	F		Becomes stronger and more massive, some healed fractures infilled with calcite and quartz					136.41	J	30	<1	Ca	10		
														6		136.48	J	60	40	Cx, Ca, Sp	14		
																136.72	J	65	100	Cx, Ca	6		
														1		137.25	J	70	3	Ca	14		
	109	54/55		1.50	100	81	89	R3	F		137.64 m: Pyrite nodule (?), 3 mm thick												
138																137.97	J	70	1	Ca, Sp	18		
																138.29	J	40	1	Ca	3		
														1		138.40	J	65	1	Ca	3		
								R3	F		Calcite and quartz veins	Good place to set a packer				138.50	J	80	1	Cl, Ca	3		
														6		138.62	J	60	1	Ca, Sp	3		
												Fractured when taken out of lifter case				138.79	J	85		Ca	3		
139														3									
	110	55/56		1.50	88	82	82									139.37	J	80	1	Ca, Sp	6		
														1									
																139.74	J	65	1	Ca, Sp	3		
																139.78	J	35	1	Cl, Ca	10		
140								R0-R2	F		Fractures and healed fractures	Area of interest for packer											
								R0-R2	F		140.00 m to 140.24 m: Vertical fractures, calcite infill, 1 mm aperture, at least four distinct fractures			2		140.20	J	0	1	Ca	6		
																140.31	J	60	1	Ca	10	PT8	
														6		140.48	J	70	1	Ca	3	2 x 10-8	
	111	56		1.50	100	21	29									140.52	J	0	1	Ca	3		
														6		140.61	J	65	1	Ca, Sp	3		
								R0-R2	F		140.78 m to 141.09 m: Healed fractures, infilled with calcite, breaks down upon handling, becomes finer grained below					140.69	J	65	1	Ca, Sp	3		
141														6		140.90	S	60	300	Ca, Sp, Cx	3		

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None Cl: Clay Qtz: Quartz FeOx: Iron Ca: Calcite NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh SW: Slightly MW: Moderately HW: Highly CW: Completely RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 3: Slightly Rough, Undulating 5: Rough Undulating, Stepped 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-108

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m)	RUN LENGTH (m)	TCR (%)	RQD (%)	SCR (%)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS	INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm)	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
			5 10 15		25 50 75	25 50 75	25 50 75				(continued from previous page)			2 4									
142	112	56/57		1.50	89	67	77	R3	F		Very fine grained, dark grey, medium strong, fresh, stockwork calcite and quartz veins			6		141.31	J	55	10	Ca	3		
														6		141.46	J	30	3	Ca	3		
																141.50	J	50	50	Ca	3		
														2		141.72	J	60	10	Ca, Cx, Sp	3		
																141.90	J	60	5	Ca	14		
														1				40					
																142.34	J	70	1	Ca	10		
														1		142.48	J	70	1	Ca	3		
																142.58	J	65	1	Ca	1		
														2		142.75	J	75	1	Ca	6		
143								R3	F		Very fine grained	Assumed core loss off top of run from highly fractured material. Bit was blocked near top of run				142.84	J	25		Ca	3		
								R3	F		143.00 m to 143.30 m: Shear zone			2									
	113	57		1.30	85	31	36	R3	F		143.52 m to 143.69 m: Shear zone					143.37	J	80	1	Ca, Sp, Qtz	3		
								R3	F		143.79 m to 143.93 m: Shear zone			6		143.60	S	45	170	Cx, Ca	6		
144								R2-R3	F					6		143.85	S	35	140	Sp	6		
														6									
																144.18	J	70	1	Ca, Sp	6		
												Last 20 cm of core highly fractured (rubble) likely due to worn out bit				144.60	J	65	<1	Sp	10		
														1		144.64	J/V	54		Sp, Ca	3		
145	114	58		1.70	96	89	76	R2-R3	F		144.88 m to 146.00 m: Fine to medium grained, dark grey, weak, moderately altered, serpentinite on fracture surfaces					145.11	J	54	<1	Sp, Ca	3		
														1		145.35	J	63	<1	Sp, Ca	3		
																145.47	J	46	3	Sp	1		
																145.51	J	60		Sp	3		
																145.52	J	60		Sp	11		
																145.67	J	51		Sp	3		
146								R2	F		Fine to medium grained, dark greenish grey, weak, moderate to highling altered, 1 mm calcite stockwork veining	Bottom 22 cm highly broken likely mechanical due to worn out bit				146.00	J	44		Ca, Sp	1		
	115	58/59		0.80	100	43	83	R2	F		146.34 m to 146.48 m: Fault/shear zone, broken and crushed rock, serpentinite, and calcite infill			1		146.34	F/S	31	14	Bx, Cx, Sp, Ca	3		
																146.48	V	20	1	Ca, Sp	3		
																146.49	J	27	3	Ca, Sp	1		
														6		146.52	J	61	2	Sp	1		
								R2	F		Increased alteration, calcite stockwork veining	Top 12 cm and bottom 16 cm highly broken (rubble) likely mechanically induced fracturing due to worn out bit				146.53	J	45	12	Ca, Sp	3		
147								R2	F					6		146.59	J	48	3	Ca, Sp	3		
								R2	F		146.82 m: 20 mm shear zone, broken and crushed rock, serpentinite, calcite and clayey gouge infill					146.64	J	9	20	Ca, Sp	3		
	116	59		1.10	100	40	49							4		146.65	J	9	30	Ca, Sp	10		
																146.71	S	37	15	Bx, Cx, Sp, Ca, Cl	3		
								R2	F		146.83 m to 146.86 m: Fault/shear zone, broken and crushed rock, serpentinite and clayey gouge infill			3		146.82	S/F	25	>3	Bx, Cx, Sp, Cl	10		
								R2	F							146.83	J/V	42	>3	Sp, Ca	3		
148								R1	F		147.58 m: 2 mm shear zone, broken rock, serpentinite and calcite infill			6		146.86	J	42	2	Sp, Ca	3		
	117	59		0.50	100	0	0	R1	F							146.93	J	59	10	Sp	3		
																146.95	J	46	1	Ca, Sp	3		
														1		146.97	J	39	2	Sp, Ca	10		
																147.01	J	30	5	Sp, Ca	3		
														6		147.05	J/V	45	120	Sp, Ca, T	3		
																147.17	J/V	75	10	Sp, Ca, T	3		
														6		147.23	J/V	72		Sp, Ca, T	4		
149																147.40	J/S	66		Bx, Sp, Ca	3		
																147.58	S/F	55		Bx, Cx, Sp, Ca, T	10	Cl	
																147.63	J	55		Sp, Ca	3		
																147.65	J	40		Sp, Ca	3		
																147.76	J	53		N	14		
																147.90	J	5		Sp, Py	3		
																148.09	S	53		Cx, Sp, Py	14		
150																148.20	J	65		N	3		
																148.31		20			3		
																		50			3		
																		0					

148.4 / 753.0

147.63 m: 10 mm shear zone, broken and crushed rock, serpentinite, calcite, talc (?) and clayey gouge infill

148.13 m to 148.25 m: Shear zone, crushed rock and serpentinite infill, pyrite vein, trace 1 mm thick

End of Hole at: 148.4 m

Shallow Monitoring Well:
50.8 mm (2") Schedule 80 PVC Standpipe with slotted screen.
Screen 31.4 to 36.0 mbgl
Filter pack 32.3 to 35.4 mbgl

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None FeOx: Iron Cl: Clay Ca: Calcite Qtz: Quartz NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh HW: Highly SW: Slightly CW: Completely MW: Moderately RS: Residual Soil
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Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-108

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m) 5 10 15	RUN LENGTH (m)	TCR (%) 25 50 75	RQD (%) 25 50 75	SCR (%) 25 50 75	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS	INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm) 2 4	DISCONTINUITY DATA: FRACTURE ZONE	DISCONTINUITY DATA: DISCONT. DEPTH (m)	DISCONTINUITY DATA: DISCONT. TYPE	DISCONTINUITY DATA: ANGLE To Core Axis (TCA)	DISCONTINUITY DATA: APERTURE (<1,1-3,>3mm)	DISCONTINUITY DATA: INFILL TYPE	DISCONTINUITY DATA: JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
151											(continued from previous page)												
152											Deep Monitoring Well: 50.8 mm (2") Schedule 80 PVC Standpipe with slotted screen. Screen 91.8 to 111.8 mbgl Filter pack 71.7 to 90 mbgl Shallow monitoring well installed in an offset hole. Negligible changes in lithology over the short offset distance were recorded.												
153																							
154																							
155																							
156																							
157																							
158																							
159																							
160																							

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None FeOx: Iron Cl: Clay Ca: Calcite Qtz: Quartz NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh HW: Highly SW: Slightly CW: Completely MW: Moderately RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 5: Rough Undulating, Stepped 3: Slightly Rough, Undulating 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-114

Klohn Crippen Berger

DATE STARTED: Mar 26, 2014	LOCATION: Kamloops, BC	BIT SIZE AND TYPE: HQ3 Impregnated Bit	SHEET 5 OF 17
DATE FINISHED: April 7, 2014	LOGGED BY: MK/LR/MC	RIG MAKE AND MODEL: Fraste Multidrill XL	GROUND ELEVATION (m): 895.5
CLIENT: KGHM International	CHECKED BY: MAB	TOTAL DEPTH (m): 152.0	COORDINATES (m): N 5609277 E 683210
PROJECT NAME: Ajax Mine Groundwater Study	DRILLING CO.: Geotech Drilling Services Ltd.	BEDROCK DEPTH (m): 38.0	COORDINATE SOURCE: KGHM
PROJECT NO.: M09871A01	DRILLER: JA/BW	AZIMUTH/ANGLE FROM VERT.: -90	

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m) (5 10 15)	RUN LENGTH (m)	TCR (%) (25 50 75)	RQD (%) (25 50 75)	SCR (%) (25 50 75)	HARDNESS	ROCK MASS WEATHERING	DESCRIPTION	DRILLING REMARKS
38	29	3		0.61	97	97	92	R4	SW-F	PICRITE, medium grained, dark grey, strong, weak to no alteration, 2 mm calcite vein at 34° at 38.32 m, iron oxidation staining present	
	30	3		0.08	100	0	0	R3	F	As above, talc and serpentinite on fracture surfaces	Core hammered out of lifter spring.
39	31	3		0.84	92	73	80	R3	SW-F	Slightly more altered, healed fractures with calcite and serpentinite infill at 45 degrees	
								R3	SW-F	39.35 m to 39.39 m: Shear zone, broken rock, calcite, talc and serpentinite infill	
								R2-R3	SW-F	Fine to medium grained, greenish grey, moderately altered, calcite veining (1-4 mm) at 45° to 50°	
40	32	3		1.50	96	55	69	R3	SW-F	39.82 m to 39.99 m: Fault/Shear zone, broken and crushed rock, calcite and serpentinite infill, iron oxide staining on fracture faces	
								R3	SW-F	40.61 m to 40.64 m: Fault/Shear zone, broken and crushed rock, talc and calcite infill	
41								R3-R4	F	Fine to medium grained, greenish grey, medium to strong rock, weakly altered, stockwork calcite veining	
	33	3/4		1.50	97	97	97	R3-R4	F	At 41.43 m: 20 mm calcite vein at 49 degrees TCA	
42											
								R2-R3	F	Fine to medium grained, greenish grey, weak to medium strong, weakly to moderately altered	
43	34	4		1.50	100	51	86				
	25	8		1.50	100	94	94	R2-R3	F	43.78 m to 43.82 m: Fault/Shear zone, broke and crushed rock, calcite and serpentinite infill	Mechanically induced rubble
44								R2-R3	F	From 43.82 m: 10 mm to 20 mm pyrite blebs throughout core	
								R3	F	Slightly stronger and less altered	
	35	4/5		1.50	100	87	85				
45											
								R3	F	Fine to medium grained, dark grey, strong rock, very weak to no alteration, calcite stockwork veining (1	

DISCONTINUITY DATA

INSTRUMENT DETAILS	FRACTURE FREQ. (No. Per 30 cm) (2 4)	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
	1		38.22	J	30	3	Ca,T	3		
	2		38.32	J/V	34	10	Ca,T	3		
	2		38.46	J	40	3	Ca,T	18		
	2		38.62	J	15		Sp,T,Ca	3		
	2		38.65	J	65	2	Sp,Ca,T	10		
	1		38.79	J	43		Ca,Sp	18		
	2		39.07	J	45	>3	Ca,Sp	10		
	2		39.15	J	51	1	Ca,Sp	10		
	6		39.35	S	40	40	Bx,Sp,Ca,T	10		
			39.39	S	29		Ca,Chl	10		
	2		39.44	J	52	2	Sp,Ca	18		
			39.62	J	18	1	Ca,Sp,Chl	10		
	6		39.75	J	39	>40	FeOx,Bx,Cx,Sp,Ca	3		
			39.82	F/S	65	>3	Bx,FeOx	3		
	4		39.99	F/S	87	>3	Ca,Sp	3		
			40.04	J	44	1	Ca	3		
	6		40.14	J	67	<1	Sp,Ca	3		
			40.26	J/V	55	1	Ca	10		
	1		40.36	J	68	1	Ca,Cx	1		
			40.39	J	68	30	Bx,Cx,T,Ca	3		
			40.52	J	66	1	FeOx	10		
			40.61	F/S	25			10		
	1		40.64	F/S	53			3		
			40.84	J	49	2	Ca,Gy	1		
			41.43	V						
	3		42.56	J	46	1	Ca,Sp	10		
			42.62	J	58	<1	Ca,Sp	3		
			42.73	J	48	1	Ca,Sp	3		
	3		42.88	J/V	46	<1	Ca,Sp	1		
			42.90	J/V	46	<1	Ca,Sp	1		
	1		43.09	J	63	<1	N	10		
			43.15	J	15	>3	Ca	3		
	3		43.48	J	45	1	Ca	3		
			43.56	J	63	2	N	3		
	6		43.66	J	38	1	Ca	3		
			43.73	J	73	>3	Ca	3	Straddle 3 9 x 10-9	
	1		43.78	F/S	64	40	Bx,Cx,Ca,Sp	6		
			43.82	F/S	64	>3	Py	6		
	1		43.88	J	55		Py,Ca	6		
			44.22	J	64	2	Ca	1		
			44.55	J	77			10		
	1		44.78	J	41	1	Ca	3		
			44.95	J	52	>3	Ca	10		
	2		45.17	J	42	4	Ca,Bx	10		
	2		45.30	J	40		Ca	4		
			45.38	J	34		N	10		
	1		45.72	J	38	1	Ca	4		

CODES:

DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack

INFILL TYPE: N: None FeOx: Iron Cl: Clay Ca: Calcite Qtz: Quartz NC: Non-Cohesive

ROCK MASS WEATHERING: F: Fresh HW: Highly SW: Slightly CW: Completely MW: Moderately RS: Residual Soil

JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 5: Rough Undulating, Stepped 3: Slightly Rough, Undulating 6: Very Rough, Stepped

HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-114

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m) (5 10 15)	RUN LENGTH (m)	TCR (%) (25 50 75)	RQD (%) (25 50 75)	SCR (%) (25 50 75)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS
46	36	5		1.50	100	100	100				(continued from previous page) mm to 4 mm)	
47	37	5/6		1.50	99	68	79	R3	F			
48								R3	F		Picrite becomes vuggy (calcite veins), highly altered, weak rock, dark green	
49	38	6		1.50	100	53	59	R3 R2	F		48.59 m to 48.67 m: Fault/shear zone, broken and crushed rock and calcite	Last 10 cm of run mechanically induced rubble from smashing out of the lifter case
50	39	6/7		1.50	100	97	100	R2 R3	F F		49.60 m: PICRITE, fine to medium grained, dark grey to black, weak rock, weakly to moderately altered, gypsum and calcite on fractured surfaces	
51								R3	F			
52	40	7		1.50	100	87	100	R3	F			
53								R1	F		Altered and shear zone	
54	41	7/8		1.50	100	34	29					
55	42	8		1.50	97	72	61	R3	F			

INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm) (2 4)	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
	1		45.91	J	42	2	Ca	4		
	2		46.24	J	40	2	Ca,Chl	3		
			46.30	J	47	>3	Ca	5		
	1		46.69	J	72	1	Ca	3		
	1		47.37	J	56	1	N	18		
	6		48.06	F/S	65	170	Bx,Ca,Ca,Sp			
			48.23	F/S	35			10		
	5		48.32	J	18	>3	Ca	3		
			48.33	J	60		Ca	10		
	6		48.42	J	34	80	Ca	3		
			48.59	F/S	39		Bx,Cx,Ca	6	PT1	
	2		48.67	F/S	17	>3	Bx,Qtz	3	2 x 10-7	
			48.94	J/V	13	>3	Ca,Cx	10		
			49.00	J	39			14		
	5		49.70	J	45	2	N	3		
			49.78	J	53	2	Gy,Ca	10		
			49.82	J	35	1	N	6		
	1		49.86	J	5	1.5	N	10		
			49.88	J/V	23	3	Gy,Ca	1		
	1		50.05	J	45		N	3		
			50.32	J	35	3	Sp, Ca	18		
	1		50.63	J			Sp, Ca	3		
			50.92	J	60	5	Sp, Ca	3		
	4		51.09	S	70	300	Sp, Ca, Py	3		
			51.12	J	65	5	Sp, Ca	3		
			51.17	J	65	3	Sp, Ca	3		
	1		52.06	J	80	3	Sp, Ca			
			52.14	J	60	14	Sp, Ca			
	1		52.70	J	60	14	Sp, T, Ca			
	2		52.81	J	70	6	Sp, Py			
	5		53.08	J	75	3	Sp, Ca			
	1		53.50	S						
	1									
	6									
	3		54.50							
	6		54.60	S	90			6		
			54.73	J	0	10	Cl	6		
	2									
			55.06	J	80	5		14		
	1		55.10	j	30	1		14		

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None Cl: Clay Qtz: Quartz FeOx: Iron Ca: Calcite NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh SW: Slightly MW: Moderately HW: Highly CW: Completely RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 3: Slightly Rough, Undulating 5: Rough Undulating, Stepped 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-114

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m)	RUN LENGTH (m)	TCR (%)	RQD (%)	SCR (%)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS	INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm)	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
			5 10 15		25 50 75	25 50 75	25 50 75				(continued from previous page)			2 4 6									
56								R3-R4	F													Straddle 2 1 x 10-7	
	43	8/9		1.50	100	100	100							1		56.77	J	65	5	Sp, Ca	3		
57														1		57.03	J	60	20	Sp, Ca	14		
														1		57.32	J	40	30	Sp, Ca, Py	3		
								R3	F					3		57.60	J	25	3	Sp, Ca, Py	14		
														3		57.64	J	80	15	Sp, Ca, Py	6		
58														3		57.74	J	75	5	Sp, Ca, Py	14		
														3		57.88	J	85	10	Sp, Ca, Py	6		
	44	9		1.50	100	58	69	R3	F		58.10 m to 58.36 m: Shear zone: broken rock, calcite, talc and serpentinite infill			6		57.95	J	90	20	Sp, Ca, Py	6		
														6		58.00	J	10	15	Sp, Ca, Py	6		
														1		58.50	J	65	15	Sp, Ca, Py	3		
59								R3	F					3		59.02	J	90	3	Sp, Ca, Py	3		
														3		59.08	J	65	50	Sp, Ca, Gy	3		
																59.25	J	65	40	Sp, Ca, Gy	14		
														2		59.37	J	60	55	Ca, Py, Sp	14		
	45	9/10		1.50	100	71	90									59.38	J	75	70	Sp, Ca, Py, T	3		
														2		59.60	J	45	3	Sp, Ca, Py	14		
60																59.80	J	45	5	Sp, Ca, Py	14		
														2		59.87	J	75	10	Sp, Ca	14		
																59.92	J	40	70	Sp, Ca, Py	14		
								R3	F		Greenish grey, fine to medium grained, medium strong rock, weakly to moderately altered, pyrite blebs					60.01	S	45		Sp, Gy	6		
																60.50	J	90	1	Sp	14		
														3		60.52	J	25		N	3		
61																60.58	J	90			14		
														1		60.97	J	70	1	Sp, Ca, Py	10		
	46	10		1.50	99	99	99							1		61.19	J	63	12	Sp, Ca	3		
														1		61.62	J	38	15	Sp, Ca	6		
														2		61.76	J	34	10	Sp, Ca	14		
62																61.99	J	54		Sp, Ca	14		
														1		62.03	J	55		Sp, Ca	3		
														1									
																62.57	J	50	3	Sp, Ca	10		
	47	10/11		1.50	100	88	100							1		62.77	J	60	3	Sp, Py	3		
63														2		63.02	J	85	5	Sp, Ca, Py	3		
																63.18	V	50	10	Sp, Ca, Py	6		
														3		63.33	J	36	3	Ca, T, Sp	3		
																63.45	J	45	3	Sp, Ca	14		
								R3	F					2		63.50	J	35	10	Sp	3		
																63.52	J	70		Sp, Ca	18		
64																63.58	J	85		Sp, Py	18		
	48	11		1.50	100	82	100							1		64.30	J	73	1	Sp, Py	10		
														1		64.53	J	35	2	Sp, Py, Ca	10		
														2		64.84	J	65	70	Sp, Ca	18		
																64.92	J	10	3	Sp, Ca	14		

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None Cl: Clay Qtz: Quartz FeOx: Iron Ca: Calcite NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh SW: Slightly MW: Moderately HW: Highly CW: Completely RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 3: Slightly Rough, Undulating 5: Rough Undulating, Stepped 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-114

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m) (5 10 15)	RUN LENGTH (m)	TCR (%) (25 50 75)	RQD (%) (25 50 75)	SCR (%) (25 50 75)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS	INSTRUMENT DETAILS
											(continued from previous page)		
66	49	11/12		1.50	100	98	100	R3	F				
67	50	12		1.50	100	87	100	R3	F				
68	51	13		1.50	93	59	72	R3	F		Fine to medium grained, greenish grey, fresh, medium strong, weakly altered, chlorie, serpentinite and calcite infill on fracture surfaces		
69								R3	F		69.29 m to 69.34 m: Shear zone, broken and crushed rock, calcite, serpentinite, pyrite and talc infill		
70	52	13		1.50	99	91	96	R2-R3	F		Fine to medium grained, greenish grey, weak to medium strong, moderately altered, calcite stockwork, sheared, cemented with clayey gouge, healed	Top 4 cm of run broken and crushed rock cemented with drilling mud	
71	53	13/14		1.50	100	90	95	R2-R3	F			Driller blocked at 71.76 m, logged as one run	
72								R3-R4	F		72.1 / 823.4 NICOLA VOLCANICS, fine to medium grained, dark greenish grey, medium-strong to strong, weakly altered		
73	54	14		1.50	99	97	97	R3-R4	F		Calcite and chlorite on fracture surfaces		
74								R3-R4	F		74.0 / 821.5 PICRITE: Fine to medium grained, greenish grey, medium to strong, weakly altered, calcite, serpentinite and chlorite on fracture surfaces		

DISCONTINUITY DATA

FRACTURE FREQ. (No. Per 30 cm) (2 4)	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
4		65.02	J	90	50	Sp, Ca	18		
		65.12	J	73	20	Sp, Ca	18		
		65.25	J	90		Sp, Ca, Py	6		
		65.62	J	85 / 81	10	Sp, Ca	10		
2		65.88	J	80	5	Sp, Ca	10		
1		66.18	J	40	5	Sp, Ca, Py	18		
1		66.34	J	84	10	Sp, Ca, Py	3		
		66.48	J	65	3	Sp, Ca, Py	18		
1		66.50	J	88		Sp, Ca, Py	3		
2		66.94	J	82	13	Sp, Ca	3		
1		67.35	J	30	10	Sp, Ca, T	10		
1		67.62	J	70	1	Sp, Ca	3		
		67.72	J	81	3	Ca, Sp	3		
2		68.01	J	60		Sp, Ca	3		
6		68.69	J	67	2	Chl	1		
		68.74	J	73		Chl	1		
		68.76	J	73	>3	Chl	1		
5		68.80	J	69	>3	Chl	1		
		68.82	J	69	2	Chl	1		
6		68.85	J	64	2	Sp, Py, Ca	10		
		68.87	J	64	1	Sp, Py, Ca	10		
2		68.91	J	69	50	N	10		
		68.95	J	69	1	N	18		
2		68.98	J	42	<1	Sp	3		
		69.02	J	36	2	Sp	3		
3		69.09	J	86	1	Sp, Py	3		
2		69.29	S/F	55	2	Bx, Ca, Sp, Py	1		
3		69.34	J	84	1	Cx, T	10		
		69.54	J	85	<1	Cs, Bx	3	PT2	
		69.69	J/S	63	<1	Sp	10	2 x 10-8	
		69.82	J	74	3	Bx, Ca, Sp	3		
1		70.02	J/V	34	2	Sp, Ca	1		
		70.24	J	34	1	Sp, Ca, T	1		
3		70.29	J	34	>3	Sp	healed		
		70.39	J	47	>3	Sp, Ca	3		
1		70.41	J	53	>3	Sp, Ca	10		
		70.53	J/V	66		Sp, Ca	1		
		70.68	J	41	1	Sp, Ca	1		
6		71.04	J	41	50	Ca	3		
		71.37	J	65	>3	Ca	1		
1		71.51	J	60		Ca	10		
		71.56	J	80	2	Ca, Sp	3		
1		71.88	J/S	57	<1	Ca, Sp, T	5		
		72.03	J/S	62		Ca	1		
1		72.08	J	78		Chl	10		
		72.11	J	71	3	Ca	3		
1		72.43	J	68		N	10		
		72.61	J	21		Ca	3		
		73.06	J/V	50			10		
		73.32							
2		73.80	J/V	36	1	Ca, Chl	3		
		73.81	J/V	36	1	Ca, Chl	3		
1		74.09	J	55		Ca, Sp, Chl	5		
		74.31	J/V	71	2	Ca, Sp, Chl	1		
2		74.51	J	54	>3	Ca	3		

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None FeOx: Iron Cl: Clay Ca: Calcite Qtz: Quartz NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh HW: Highly SW: Slightly CW: Completely MW: Moderately RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 5: Rough Undulating, Stepped 3: Slightly Rough, Undulating 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-114

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m) 5 10 15	RUN LENGTH (m)	TCR (%) 25 50 75	RQD (%) 25 50 75	SCR (%) 25 50 75	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS	INSTRUMENT DETAILS	FRACTURE FREQ. (No. Per 30 cm) 2 4	FRACTURE ZONE	DISCONTINUITY DATA: DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
											(continued from previous page)												
75	55	14/15		1.50	93	83	90							2		74.53	J/V	18	2	Ca, Sp, Chl	3		
																74.66	V	47	5	Ca, Sp, Chl	1		
																74.86	J	29	3	Ca, Sp, Chl	3		
								R3-R4	F		1 mm to 4 mm calcite veins at 45° to 50°												
76														1		75.93	V	52	<1	Ca, Chl	1		
	56	15		1.50	100	100	99							1		76.25	J	63	1.5	Ca, Chl, T	10		
																76.41	V/J	45	<1	Ca, Chl, T	2		
														1		76.70	J	61	15	Ca, SP, Py, Chl, T	1		
77														2		77.00	J/V	52		Ca, Chl	3		
								R3-R4	F		Fine to medium grained, dark greenish grey, medium to strong, weakly to not altered, massive, calcite veins < 1 mm to 2 mm thick at 50°												
	57	15/16		1.50	100	100	100																
78														1		78.38	J/V	50	2	Ca,T,Sp	1		
								R3-R4	F					V									
79								R3-R4	F		78.93 m to 78.98 m: Calcite veins 3 mm to 5 mm thick 50°			1		78.93	J/V	50	<1	Ca,Sp	1		
	58	16		1.50	85	77	77	R3-R4	F		79.15 m to 79.40 m: Stockwork calcite veins 1 mm to 3 mm thick												
								R0	F		79.64 m to 79.40 m: Fault with CLAYEY GOUGE(CH) infill, intermediate to high plasticity, stiff to very stiff, grey, dry to moist, homogeneous					79.64	F	45	50	Cl, Ca, Sp			
								R1-R2	F							79.70							
80	59	16		0.20	100	100	100	R0	F					2		80.00	F	90		Cl, Ca, Sp			
								R3	F							80.12	J	54	80	Sp, Ca, Chl			
								R3	F		79.70 m: Highly altered with calcite and serpentinite infill on fracture surfaces			3		80.20	F	54	>3	Cl, Sp, Ca			
																80.24	J	26	>3	Ca, Chl			
											80.00 m to 80.12 m: Fault infilled with CLAYEY GOUGE (CH), same as above except moist to wet, and broken rock			2		80.29	J	45	>3	Sp			
	60	16/17		1.30	100	60	70									80.31	J	74	>3	Sp			
81														2		80.36	J	66	>3	Sp			
																80.57	J	64	>3	Sp, Ca, Chl			
								R0	F		80.24 m to 80.31 m: Fault with CLAY gouge (CH) and broken rock					80.61	J	43	>3	Sp, Ca			
								R0	F					6		80.90	J	18	>3	Sp			
								R3	F		81.20 m to 81.36 m: Shear zone with broken and crushed rock, serpentinite, calcite and chlorite infill			1		81.02	J	64	160	Sp, Ca, Chl	1		
											81.22 m to 81.35 m: Shear zone with crushed rock infill			2		81.10	S	41	Bx, Ck, Sp, Ca, Chl			
																81.14	J	9	-	Sp, Chl, T			
82														1		81.20	J	39	<1	T, Ca, Chl, Sp			
	61	17		1.50	100	97	100	R1-R2	F							81.36	V/S	17		T, Sp, Ca, Chl		Straddle 1 1 x 10-9	
																81.46		54					
																81.50		23					
											Fine to medium grained, dark greenish grey, medium strong, moderately altered, calcite stockwork veining and 2 mm to 10 mm calcite veins at 36°					81.58							
83								R3	F		82.20 m to 82.46 m: Healed microfracturing with clayey gouge infill, highly altered					83.03	J	36	-	Sp	1		
														3		83.07	J	25	>3	Ca, Sp	1		
																83.11	J	35	>3	Ca, Sp	1		
														2		83.29	J/V	40	3	Ca, Sp	1		
	62	17/18		1.50	100	95	95	R3	F		83.59 m to 83.76 m: Healed microfracturing with clayey gouge infill, highly altered					83.54	J	75	5	Ca, Sp	3		
																83.59	J	45	<1	Ca, Sp	6		
														1		83.76	J	85	>3	Ca, Sp	18		
84														1		84.05	J	70	50	Ca, Sp	18		

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None FeOx: Iron Cl: Clay Ca: Calcite Qtz: Quartz NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh HW: Highly SW: Slightly CW: Completely MW: Moderately RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 5: Rough Undulating, Stepped 3: Slightly Rough, Undulating 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-114

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m) 5 10 15	RUN LENGTH (m)	TCR (%) 25 50 75	RQD (%) 25 50 75	SCR (%) 25 50 75	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS
								R0	F		(continued from previous page)	
								R0	F		84.05 m to 84.12 m: Rock crumbles in hand at joint	
								R0	F		84.12 m to 84.25 m: Healed microfracturing with clayey gouge infill, highly altered	
								R3	F		84.22 m to 84.27 m: Fault, infilled with crushed rock, clayey gouge, calcite and serpentinite	
85	63	18		1.50	100	100	100	R3	F		84.50 m to 84.75 m: Calcite veins <1 mm to 3 mm thick aligned 35° TCA	
								R3	F		At 85.16 m: 10 mm calcite vein at 35°	
											At 85.56 m: 5 mm calcite vein at 40°	
86								R3	F		Calcite veins <1 mm to 10 mm thick aligned 35°	
	64	18/19		1.50	100	97	97					
87												
								R3	F			
88	65	19		1.50	100	93	95					
								R3	F		At 88.65 m: 10 mm calcite vein at 30°	
								R3	F		88.81 m to 88.98 m: Healed microfracturing, highly altered	
89								R3	F			
								R3	F		89.40 m to 89.55 m: Healed microfracturing, highly altered	
	66	19		1.50	100	87	87	R0	F		89.70 m to 89.73 m: Highly altered, serpentinization	
90												
								R0	F		90.42 m to 90.50 m: Shear zone, broken rock, calcite and serpentinite infill	
								R0	F		Moderately to highly altered with stockwork calcite veins <1 mm to 5 mm thick	
91	67	20		1.50	100	100	100					
								R0	F		91.35 m to 91.60 m: Healed microfracturing, highly altered	
92								R3	F		Fine to medium grained, dark greenish grey, medium strong, weakly to moderately altered, stockwork veining and 1 mm to 10 mm calcite veins	
	68	20		1.50	100	95	95	R3	F		92.67 m: Healed joint infilled with calcite and serpentinite	
93												
								R3	F			

INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm) 2 4	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
	2		84.21	F	85	40	Ca, Sp	18		
			84.36	J	75	20	Ca, Sp	14		
	1		85.08	J	85	15	Ca, Sp	14		
	1		85.31	J/V	50	10	Ca, Sp	3		
	2		85.52	J	65	10	Ca, Sp	10		
			85.60	J	85	20	Ca, Sp	10		
	1		85.98	J	44	-	Ca, Sp	6		
	1		86.26	J	85	3	Ca, Sp	18		
	1		86.50	J	80	3	Sp	3		
	3		86.75	V	40	>3	Ca, Sp	3		
			86.77	J	30	>3	Ca, Sp	3		
	1		86.80	J	90	20	Ca, Sp	14		
			87.06	J	75	10	Ca, Sp	14		
	1		87.76	J	40	10	Ca, Sp	10		
	1		88.25	J	65	5	N	14		
	2		88.55	J	75	10	Ca	3		
			88.60	J	30	>3	Sp	1		
	2		88.81	J	75	10	N	18		
			88.98	J	85	20	Ca, Sp	6		
	2		89.01	J	40	<3	Ca, Sp	3		
			89.17	J	75	40	Ca, Sp	10		
	1		89.38	J	55	<1	Ca, Sp	18		
	1		89.71	J	40	30	Ca, Sp	18		
	3		89.95	J	80	20	Ca, Sp	10		
			89.97	J	40	-	Ca, Sp	3		
			89.99	J	35	1	Ca, Sp	3		
	6		90.26	J	70	10	Ca, Sp	10		
			90.42	S	15	-	Ca, Sp	18		
	1		91.07	J	40	20	Ca, Sp, Gy	3		
	3		92.86	J	30	5	Ca, Sp, T	3		
	1		92.87	J	55	-	Ca, Sp	10		
			92.91	J	75	3	Ca, Sp	3		
	2		93.03	J		5	Ca, Sp	3		
			93.42	J	80	10	Ca, Sp	3		
			93.49	J	70	<3	Ca, Sp	18		

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None FeOx: Iron Cl: Clay Ca: Calcite Qtz: Quartz NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh HW: Highly SW: Slightly CW: Completely MW: Moderately RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 5: Rough Undulating, Stepped 3: Slightly Rough, Undulating 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-114

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m) 5 10 15	RUN LENGTH (m)	TCR (%) 25 50 75	RQD (%) 25 50 75	SCR (%) 25 50 75	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS	INSTRUMENT DETAILS
94	69	21		1.50	99	89	99				(continued from previous page)		
95								R3	F				
	70	21		1.50	100	94	100						
96								R3	F		Fine to medium grained, dark grey, moderately altered, medium strong, stockwork calcite veining (2 mm to 4 mm thick), serpentinite, talc and calcite on fracture surfaces		
97	71	21/22		1.50	100	81	91						
98								R3-R4	F		Medium grained, dark greenish grey, weakly to moderately altered, medium to strong, calcite veins predominantly at 25°-30°, 5 mm to 10 mm thick		
	72	22		1.50	95	78	84						
99								R3-R4 R3-R4	F F		98.82 m to 99.20 m: Microfracturing in PICRITE 98.85 m: 10 mm calcite vein at 28°		
								R3	F		Calcite veins as above, veins are less than 3 mm thick, several healed fractures		
100	73	22/23		1.50	100	72	96						
101								R3 R2-R3	F F		100.90 m to 100.94 m: Shear zone, crushed rock with clayey gouge, calcite and serpentinite infill Calcite veins are less than 1 mm with no distinct orientation, several healed fractures, some fractures are slickensided		
	74	23		1.50	100	87	91						
102								R2	F		Calcite veins up to 12 mm thick, oriented at 15° and 40°, some healed fractures		
103	75	23/24		1.50	99	94	94						

DISCONTINUITY DATA

FRACTURE FREQ. (No. Per 30 cm) 2 4	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)
1		94.08	J/V	25	1	Ca, Sp	3
2		94.24	J	65	5	Ca, Sp	10
1		94.35	J	55	>3	Ca, Sp	10
		94.63	J	45	<1	Ca, Sp, Gy	10
1		94.87	J	70	>3	Ca, Sp	3
1		95.52	J/V	55	<3	Ca, Sp	3
		95.93	J	35	10	Ca, Sp	1
2		96.05	J	80	20	Ca, Sp	10
		96.31	J	40	>3	Ca, Sp	10
3		96.32	J	50	>3	Ca, Sp	10
		96.39	J	60	30	Ca, Sp	10
1		96.72	J	70	<3	Bx, Sp, Ca, T, Chl	10
		96.93	J	25	2	Ca, Sp	3
5		96.94	J	37	<1	Ca, Sp	3
		97.00	J	63	2	Ca, Sp	3
3		97.04	J	66	<1	Ca, Sp	3
		97.05	J	36	1	Ca, Sp	3
4		97.19	J	70	1	Ca, Sp, Chl	10
		97.28	J	54	>3	Ca, Sp, Chl	1
		97.29	J	18	<1	Ca, Sp, Chl	10
		97.52	J	88	>3	Ca, Sp	3
		97.55	J	8	3	Ca, Sp, T, Chl	3
		97.56	J	8	3	Ca, Sp, T, Chl	3
1		97.59	J	87	3	Ca, Sp, Chl	10
		98.51	J	36	4	Ca	10
2		98.81	J	15	>3	Ca, Sp	3
		98.87	J/V	28	1	Ca, Sp	1
3		98.92	J	24	<1	Ca, Sp	3
		99.04	J	32	1.5	Bx, Ca, Sp	3
3		99.13	J	54	2	Bx, Ca, Sp	3
		99.27	J	41	3	Sp	1
4		99.31	J	83	3	Ca, Sp	3
		99.43	J	62	-	Ca, Sp	3
1		99.51	J	45	<1	Ca, Sp	10
		99.52	J	60	<1	Ca	6
		99.56	J	60	<1	Ca	3
		99.65	J	25	1	Ca, Sp	3
2		99.93	J	55	1	Ca, Sp	3
		100.40	J	80	1	Ca, Sp	10
1		100.49	J	50	1	Ca, Sp	6
		100.92	S	25	40	Cx, Cl, Ca, Sp	3
		101.35	J	20	<1	Ca, Sp	10
4		101.38	J	20	<1	Ca, Sp	3
		101.42	J	70	1	Ca	3
1		101.57	J	30	20	Cx, Ca, Sp	10
1		101.79	J	80	3	Ca, Sp	6
		101.95	J	65	<1	Ca, Sp	1
4		102.29	J	25	<1	Ca, Sp	10
		102.31	J	75	<1	Ca	18
2		102.43	J	75	1	Ca, Cl	3
		102.50	J	30	-	Ca, Sp	3
		102.53	J	35	<1	Ca, Sp	10
		102.56	J	45	<1	Ca, Sp	10
1		103.28	J	30	1	Ca, Sp	14

PERMEABILITY (m/sec): PT4 3 x 10-8

SAMPLE RETAINED

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None Cl: Clay Qtz: Quartz FeOx: Iron Ca: Calcite NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh SW: Slightly MW: Moderately HW: Highly CW: Completely RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 3: Slightly Rough, Undulating 5: Rough Undulating, Stepped 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-114

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m)	RUN LENGTH (m)	TCR (%)	RQD (%)	SCR (%)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS
			5 10 15		25 50 75	25 50 75	25 50 75				(continued from previous page)	
104	76	24		1.50	93	84	93	R2-R3	F		Calcite veins up to 5 mm thick at 60°, less healed fractures	
105												
106	77	24/25		1.50	100	78	98	R2-R3	F		Calcite veins less than 1 mm thick, few healed fractures	
107	78	25		1.50	97	88	97	R2	F		Calcite veins up to 3 mm thick at 15°, increase in healed fractures infilled with clayey gouge, calcite and serpentinite	
108												
109	79	25		1.50	100	69	77	R2-R3	F		Calcite veins less than 1 mm thick, few healed fractures	
110	80	25		1.50	100	51	67	R0 R0 R0	F F F		109.79 m to 109.81 m: Shear zone, crushed rock with calcite, clayey gouge and serpentinite infill 109.88 m to 109.93 m: Shear zone, crushed rock with calcite, clayey gouge and serpentinite infill 110.00 m to 110.12 m: Shear zone, crushed rock, with calcite, clayey gouge and serpentinite infill	
111												
112	81	26		1.50	100	100	100	R0 R3 R0	F F F		111.35 m to 111.44 m: Shear zone, crushed rock with calcite, clayey gouge and serpentinite infill 111.92 m to 111.98 m: Healed shear zone infilled with crushed rock, clayey gouge, calcite and serpentinite	

INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm)	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
	2 4									
	3		103.45	J	45	1	Ca, Sp	10		
			103.47	J	65	1	Ca	3		
			103.69	J	65	<1	Ca, Sp	3		
	2		104.25	J	65	1	Ca, Sp	3		
			104.29	J	65	<1	Ca, Sp	3		
			104.95	J	60	<1	Ca, Sp	1		
	3		105.15	J	55	<1	Ca, Sp	1		
	2		105.18	J	55	1	Ca, Sp	1		
			105.21	J	50	6	Ca, Sp	10		
	2		105.40	J	45	-	Ca, Sp	10		
			105.54	J	50	3	Ca, Sp	10		
	1		105.73	J	30	1	Ca, Sp, T	1		
			106.04	J	75	1	Ca, Sp	10		
	1		106.33	J	75	1	Ca, Sp	3		
	2		106.44	J	55	1	Ca, Sp, T	10		
			106.66	J	75	2	Ca, Sp, Cl	3		
	2		106.73	J	45	<1	Ca, Sp, T	1		
			106.96	J	60	3	Ca, Cl	10		
	1		107.00	J	50	-	Ca, Cl, Cx	3		
	1		107.51	J	55	<1	Ca, Sp	10		
	1		107.99	J	55	1	Ca, Sp	3		
	2		108.33	J	65	1	Ca, Sp	18		
			108.42	J	15	1	Ca, Sp	3		
	5		108.50	J	15	-	Ca, Sp	10		
			108.55	J	20	1	Ca, Sp	10		
			108.59	J	15	1	Ca, Sp	1		
	3		108.74	J	65	1	Ca, Sp	10		
			108.79	J	50	10	Ca, Sp	10		
			108.97	J	70	1	Ca, Sp	3		
	2		109.06	J	25	1	Ca, Sp	1		
			109.08	J	25	1	Ca, Sp	1		
	2		109.56	J	70	1	Ca	6		
			109.67	J	55	1	Ca, Sp	6		
			109.80	S	60	20	Cx, Ca, Sp, Cl	1		
	4		109.91	S	60	50	Cx, Ca, Sp, Cl	1		
			110.00	S	40	-	Ca, Sp	1		
	3		110.17	J	55	30	Ca, Sp	10		
			110.26	J	40	>3	Ca, Sp	3		
			110.29	J	80	5	Ca, Sp	10		
			110.39	J	65	<3	Ca, Sp	10		
	4		110.43	J	65	5	Ca, Sp	3		
			110.48	J	50	15	Ca, Sp	14		
	3		110.98	J/S	50	5	Ca, Sp	3		
			111.12	J	40	>3	Ca, Sp	6		
	2		111.15	J	45	>3	Ca, Sp	6		
			111.19	J	70	40	Ca, Sp	10		
	1		111.35	J	90	80	Ca, Sp	18		
			111.48	S	0	10	Ca, Sp	3		
			111.48	J	0	>3	Ca, Sp	3		
			111.50	J	45	-	Ca, Sp	18		
			111.64	J	65	10	Ca, Sp	3		
	1		111.92	J	45	<1	Ca, Sp, Cl, Cx	3		
	1		112.63	J	85	20	Ca, Sp	10		

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None Cl: Clay Qtz: Quartz FeOx: Iron Ca: Calcite NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh SW: Slightly MW: Moderately HW: Highly CW: Completely RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 3: Slightly Rough, Undulating 5: Rough Undulating, Stepped 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-114

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m) 5 10 15	RUN LENGTH (m)	TCR (%) 25 50 75	RQD (%) 25 50 75	SCR (%) 25 50 75	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS
											(continued from previous page)	
113								R3	F		Weakly altered	
	82	26/27		1.50	100	100	100					
114												
								R2-R3	F		Some vugging, calcite veins <1 mm to 5 mm thick, weakly to moderately altered	
115	83	27/28		1.50	97	76	76					
116								R2-R3	F		Moderately to highly altered, healed microfractures	
	84	27/28		1.50	100	73	73					
117								R0	F		117.15 m to 117.24 m: Shear zone infilled with crushed rock, clay, calcite and serpentinite	
								R3	F		Weakly to moderately altered stockwork calcite veins, <1 mm to 5 mm thick	
118	85	28		1.50	100	100	100					
119								R2-R3	F		Weakly to moderately altered, some vugging	
	86	28/29		1.50	97	97	97					
120												
								R2-R3	F		Weakly to moderately altered	
121	87	29		1.50	95	55	95				120.88 m to 121.20 m: Healed microfractures 45°	
122								R2-R3	F			

INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm) 2 4	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
			112.91	J	55	>3	Ca, Sp	3		
			113.33	J	45	10	Ca, Sp	10		
	1									
	1		113.67	J	40	<1	Ca, Sp	10		
	1		114.73	J	70	<3	Ca, Sp	10		
	1		115.14	V	45	3	Ca, Sp	3		
	1		115.90	J	50	5	Ca, Sp	3		
	1		116.02	J	55	-	Ca, Sp	18		
	1		116.43	J	60	10	Ca, Sp	14		
	1		116.89	J	60	>3	Ca, Sp, Cl	10		
	1		117.15	S	90	80	Ca, Sp, Cl, Bx	3		
	6									
	1		117.91	J	80	10	Ca, Sp	18		
	1		118.07	J/V	45	5	Ca, Sp	14		
	2		118.48	J	25	-	Ca, Sp	3		
	2		118.52	J	70	5	Ca, Sp	10		
			118.84	S	55	35	Ca, Sp	14		
			118.96	J	20	>3	Ca, Sp	3		
			119.29	J	15	10	Ca, Sp	6		
	1		119.31	J	70		Ca, Sp	14		
			119.52	J	70	<3	Ca, Sp	10		
	2		119.73	J	5	-	Ca, Sp	1		
			119.76	J	80	>3	Ca, Sp	18		
	2		120.16	J	60	10	Ca, Sp	18		
	1									
	3		120.61	J	40	3	Ca, Sp	10		
			120.64	J	40	<3	Ca, Sp	10		
	2		120.73	J	30	5	Ca, Sp	10		
			120.85	J	15	<3	Ca, Sp	10		
			120.91	J	40	5	Ca, Sp	18		
	1		121.43	J/V	40	<1	Ca, Sp	10		
	3		121.75	J	60	3	Ca, Sp	10		
			121.78	V	75	3	Ca, Sp	3		
			121.89	J	35	3	Ca, Sp	10		
	4		122.08	J	70	10	Ca, Sp	10		
	1		122.22	J	35	>3	Ca, Sp	14		

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None FeOx: Iron Cl: Clay Ca: Calcite Qtz: Quartz NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh HW: Highly SW: Slightly CW: Completely MW: Moderately RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 5: Rough Undulating, Stepped 3: Slightly Rough, Undulating 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-114

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m)	RUN LENGTH (m)	TCR (%)	RQD (%)	SCR (%)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS	INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm)	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
			5 10 15		25 50 75	25 50 75	25 50 75				(continued from previous page)			2 4									
123	88	29/30		1.50	100	90	100									122.24	J	85	>3	Ca, Sp	14		
														2		122.28	J	90	15	Ca, Sp	14		
																122.56	J	90	10	Ca, Sp	14		
														2		122.68	J/V	60	<1	Ca, Sp	6		
																122.81	J/V	25	3	Ca, Sp	14		
																123.01	J/V	70	3	Ca, Sp	14		
														3		123.17	J/V	45	1	Ca, Sp	3		
124								R3	F							123.24	J	45	5	Ca, Sp	3		
														1		123.25	J/V	50	<1	Ca, Sp	3		
																123.41	J	55	10	Ca, Sp	3		
														1		123.61	J	40	<1	Ca, Sp	3		
	89	30		1.50	97	91	91									123.94	J	60	<1	Ca, Sp	3		
																124.41	J	80	3	Ca, Sp	3		
														1									
125														6									
								R3	F							125.12	J	25	1	Ca, Sp	3		
														3		125.25	J	35	1	Ca, Sp	3		
																125.29	J	0	1	Ca, Sp	3		
														1		125.55	J	30	<1	Ca, Sp	3		
	90	30/31		1.50	100	63	93									125.63	J	45	5	Ca, Sp	18		
														2		125.80	J	35	15	Ca, Sp	6		
126																126.00	S	90	20	Ca Sp, Cl, Cx	6		
								R0	F		126.00 m to 126.02 m: Shear zone infilled with crushed rock, clayey gouge, serpentinite and calcite		2		126.12	J	70	10	Ca, Sp	6		
								R0	F							126.20	S	60	110	Ca, Sp, Cx	18		
								R0	F		126.20 m to 126.31 m: Shear zone infilled with crushed rock, serpentinite and calcite			2		126.41	S	90	50	Ca, Sp, Cx	18		
								R3	F														
											126.41 m to 126.46 m: Shear zone infilled with crushed rock, calcite and serpentinite			1		126.80	J/V	70	1	Ca, Sp	3		
127														1									
	91	31		1.50	97	83	97									127.09	J	90	20	Ca, Sp	18		
														1		127.57	J	45	20	Ca, Sp	10		
								R1	F		127.60 m to 127.94 m: Healed microfractures												
128														1		127.92	J	80	20	Ca, Sp	10		
								R3	F		128.00 m to 128.75 m: Healed microfractures												
														1		128.49	J	35	2	Ca, Sp	10		
	92	31/32		1.50	100	73	73																
129																128.94	J	90	3	Ca, Sp	3		
														2		129.10	J	30	1	Ca, Sp	3		
																129.24	J	15	1	Ca, Sp	3		
								R3	F		129.37 m to 129.50 m: Broken core, during removal from lifter case			6		129.33	J	30	1	Ca, Sp	3		
								R3	F							129.37	J	20	1	Ca, Sp	3		
														2		129.50	J	45	-	Sp	10		
130																129.60	J	40	3	Ca, Sp	18		
														3		129.87	J	25	2	Ca, Sp	10		
																129.96	J	45	<1	Ca, Sp	10		
	93	32		1.50	99	68	76	R3	F		130.14 m to 130.23 m: Fractured zone			3		130.03	J	35	<1	Ca, Sp	10		
								R2	F		130.46 m to 131.00 m: Healed microfractures					130.16	J	50	2	Ca, Sp, Cx	10		
														2		130.20	J	50	3	Ca, Sp, Cx	10		
																130.23	J	50	2	Ca, Sp, Cx	10		
																130.46	S	80	2	Cl, Ca, Sp	10		
131																130.61	S	60	4	Cl, Ca, Sp	1		
								R2	F		Subvertical and sub-horizontal fractures, infilled with calcite and serpentinite, with some crushed rock and clayey infill		6		131.23	S	55	15	Ca, Sp, Cx	14		
																131.32	S	80	5	Ca, Sp	3		
														4		131.35	J	30	1	Ca, Sp	3		
	94	32/33		1.50	100	35	47									131.43	J	45	1	Ca	3		
														4		131.56	J	70	1	Ca	6		
132																131.66	J	80	1	Ca, Sp	14		

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None FeOx: Iron Cl: Clay Ca: Calcite Qtz: Quartz NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh HW: Highly SW: Slightly CW: Completely MW: Moderately RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 5: Rough Undulating, Stepped 3: Slightly Rough, Undulating 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-114

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m)	RUN LENGTH (m)	TCR (%)	RQD (%)	SCR (%)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS
			5 10 15		25 50 75	25 50 75	25 50 75				(continued from previous page)	
133	95	33		1.50	100	56	83	R2-R3	F		Some healed microfractures throughout run, less fractured than above run	
134	96	33/34		1.50	100	81	92	R2-R3 R2 R2	F F F		134.16 m to 134.40 m: Healed microfractures 134.64 m to 134.70 m: Fractured zone, criss-crossing fractures at 35°	
135								R2	F		135.10 m to 135.40 m: Healed microfractures	
136	97	34		1.50	97	86	97					
137	98	34		1.50	100	83	86	R2	F		137.79 m to 137.94 m: Shear zone, crushed rock and clayey gouge with serpentinite and calcite infill	
138												
139	99	35		1.50	100	87	91	R2	F		139.70 m to 139.77 m: Fractured zone	
140								R2	F		Jointed, few healed microfractures	
141	100	35		1.50	100	46	83					

INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm)	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
	2 4									
	4		131.70	J	0	1	Ca, Sp	14		
	4		131.84	J	80	<1	Ca, Sp	10		
	3		131.90	J	30	1	Ca, Sp	3		
	2		131.96	J	25	<1	Ca, Sp	3		
	2		132.00	J	10	5	Cx, Ca, Sp	10		
	2		132.06	J	55	<1	Ca, Sp	6		
	2		132.14	J	60	2	Ca	6		
	2		132.30	J	60	1	Ca, Cl	6		
	2		132.38	J	60	10	Ca	3		
	2		132.49	J	25	1	Ca, Sp	3		
	2		132.50	J	40	-	T, Sp	10		
	2		132.55	J	25	3	Ca, Sp	3		
	2		132.69	J	65	1	T, Ca, Sp	3		
	1		132.93	J	15	1	Ca, Sp	3		
	1		133.00	J	65	1	Ca, Sp	6		
	2		133.15	J	45	1	T, Ca, Sp	3		
	2		133.25	J	70	<1	Ca, Sp	14		
	2		133.54	J	45	1	Ca, Sp	10		
	3		133.58	J	50	3	T, Ca, Sp	10		
	3		133.84	J	50	<1	Ca, Sp	1		
	3		133.93	J	55	1	Ca, Sp	1		
	1		134.26	J	35	<1	Ca, Cl, Sp	10		
	1		134.48	J	35	<1	Ca, Sp	3		
	1		134.49	J	35	1	Ca, Sp	3		
	1		134.64	J	45	1	Ca, Sp	3		
	1		134.70	J	35	1	Ca, Sp	3		
	1		134.84	J	15	1	Ca, Sp	10		
	1		135.40	J	55	1	Ca, Sp, T	1		
	1		135.72	J	60	1	Sp, Ca, Sp	3		
	1		135.89	J	70	1	Ca, Sp	10		
	1		136.22	J	70	<1	Ca, Sp	3		
	1		136.66	J	40	1	Ca, Sp	1		
	3		136.77	J	45	<1	Ca, Sp	1		
	3		136.84	J	30	1	Ca, Sp	1		
	3		136.97	J	45	-	Ca, Sp	10		
	3		137.10	J	40	3	Ca, Sp	3		
	2		137.30	J	60	1	Ca, Sp	1		
	2		137.36	J	60	1	Ca, Sp	1		
	6		137.44	J	60	1	Ca, Cl, Sp	1		
	6		137.87	S	80	150	Ca, Sp, Cl, Cx	10		
	1		138.15	J	45	1	N	1		
	1		138.34	J	60	1	Ca	10		
	2		138.61	J	65	<1	Ca, Sp	1		
	2		138.75	J	65	<1	Ca, Sp	1		
	1		139.22	J	70	<1	Ca, Sp	6		
	2		139.47	J	20	<1	Ca, Sp	10		
	2		139.51	J	20	<1	Ca, Sp	3		
	6		139.75	J	35	20	Cx, Ca, Sp	14		
	6		139.82	J	65	3	Ca	14		
	4		139.97	J	40	1	Ca	10		
	4		140.00	J	60	-	Ca, Sp	3		
	4		140.05	J	70	2	Ca, Sp	3		
	3		140.07	J	60	1	Ca, Sp	3		
	3		140.17	J	55	1	Ca, Sp	6		
	3		140.35	J	45	1	Ca, Sp	14		
	3		140.41	J	60	1	Ca, Sp	10		
	3		140.44	J	70	2	Ca, Sp	10		
	6		140.53	J	55	1	Ca, Sp	3		
	6		140.67	J	65	3	Ca, Sp	3		
			140.72	J	80	1	Ca	3		
			140.87	J	70	1	Ca	10		

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None Cl: Clay Qtz: Quartz FeOx: Iron Ca: Calcite NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh SW: Slightly MW: Moderately HW: Highly CW: Completely RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 3: Slightly Rough, Undulating 5: Rough Undulating, Stepped 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-114

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m)	RUN LENGTH (m)	TCR (%)	RQD (%)	SCR (%)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS	INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm)	DISCONTINUITY DATA: FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	DISCONTINUITY DATA: ANGLE To Core Axis (TCA)	DISCONTINUITY DATA: APERTURE (<1,1-3,>3mm)	DISCONTINUITY DATA: INFILL TYPE	DISCONTINUITY DATA: JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
			5 10 15		25 50 75	25 50 75	25 50 75				(continued from previous page)			2 4									
142	101	35/36		1.50	100	89	49	R2	F		Jointed, few healed microfractures, several criss-crossing sub-vertical fractures			6		140.94	J	70	1	Ca, Sp	10		
														5		141.04	J	70	1	Ca, Sp	3		
																141.09	J	70	1	Ca, Sp	3		
														4		141.24	J	70	3	Ca, Sp	3		
																141.38	J	35	1	Ca, Sp	3		
																141.41	J	35	1	Ca, Sp	3		
														4		141.48	J	0	-	Ca, Sp	3		
																141.57	J	5	1	Ca	3		
																141.62	J	50	1	Ca	10		
143								R0	F					6		141.67	J	80	1	Ca	6		
								R2	F		142.84 m to 142.90 m: Shear zone, clayey gouge and crushed rock, broken core, calcite and serpentinite infill					141.69	J	45	1	Ca	14		
														6		141.70	J	25	1	Ca, Sp	3		
	102	36		1.25	90	8	26	S4-R0	F		Fractured with shear zones					141.90	J	45	1	Ca, Sp	10		
											143.38 m to 143.66 m: Shear zone, crushed rock and clayey gouge, calcite and serpentinite infill			6		141.93	J	20	2	Ca, Sp	3		
								R0	F							141.95	J	70	1	Ca, Sp	3		
144														6		142.04	J	30	1	Ca, Sp	6		
																142.07	J	60	1	Ca	6		
											143.76 m to 144.25 m: Fractured zone, numerous sub-vertical fractures which are criss-crossing, smooth and planar			6		142.13	J	20	1	Ca	14		
	103	36		0.25	100	0	0	R2	F							142.15	J	60	1	Ca, Sp	10		
														6		142.19	J	60	1	Ca, Sp	10		
								R3	F		Fractured, fractures typically sub-vertical, smooth and wavy with calcite and serpentinite infill					142.41	J	45	1	Ca, Sp	3		
														3		142.42	J	60	1	Ca, Sp	3		
																142.61	J	70	<1	N	10		
145											Jointed			3		142.73	J	65	<1	N	6		
																142.77	J	10	1	N	6		
	104	36/37		1.50	96	33	67							2		142.82	J	60	<1	Ca	6		
																142.87	S	50	60	Bk, Cx, Sp, Ca			
																143.06	J	50	1	Ca, Sp	3		
											145.7			6		143.16	J	50	1	Ca, Sp	3		
											749.8					143.19	J	10	1	Ca, Sp	6		
								R3	F		145.70 m to 146.00 m: FRACTURED ZONE, sub-vertical fractures with rough and planar fracture surfaces, calcite infill			6		143.22	J	50	3	Ca, Sp	1		
146								R3	F		146.0					143.29	J	50	3	N	6		
											749.5					143.39	J	50	10	Cx, Ca, Sp	3		
											PICRITE, jointed			3		143.51	S	25	50	Cl, Cx, Ca, Sp	14		
																143.62	S	35	15	Cl, Cx, Ca, Sp	3		
	105	37		1.50	100	89	82							5		144.50	J	25	-	Ca, Sp	14		
																144.56	J	30	2	Ca, Sp	10		
147														3		144.75	J	60	1	Ca, Sp	6		
																144.90	J	80	3	Ca, Sp	6		
														4		145.00	J	35	1	Ca, Sp	3		
																145.10	J	75	1	Ca, Sp	6		
														6		145.23	J	45	1	Ca, Sp	3		
								R3	F							145.30	J	45	1	Ca	6		
														6		145.42	J	60	1	Ca	6		
148																145.48	J	70	1	N	6		
	106	37/38		1.50	100	49	91							6		145.57	J	65	1	N	6		
																145.60	J	75	3	Ca	6		
														1		145.65	J	25	1	Ca	3		
																145.68	J	20	1	Ca	14		
														6		145.79	J	20	1	Ca	6		
								R3	F		148.73 m to 148.74 m: Shear zone infilled with clayey gouge, crushed rock, serpentinite and calcite					145.82	J	10	1	Ca	6		
149								R2-R3	F		149.00 m to 149.13 m: Shear zone infilled with crushed rock, clayey gouge, calcite and serpentinite infill			6		146.00	J	25	-	Sp	3		
																146.10	J	65	2	Ca, Sp	3		
														1		146.19	J	80	1	Ca, Sp	3		
																146.32	J	55	2	Ca	10		
														2		146.46	J	55	1	Ca	14		
	107	38		1.50	100	48	88									146.48	J	55	1	N	6		
														6		146.57	J	65	1	Ca	6		
150																146.59	J	40	1	Ca, Sp	3		
														6		146.66	J	65	1	Ca, Sp	6		
																146.77	J	60	1	Ca, Sp	10		
														6		146.80	J	70	1	Ca, Sp	3		
																146.95	J	65	1	Ca, Sp	3		
														6		146.99	J	70	<1	Ca, Sp	3		
																147.13	J	35	1	Ca, Sp	6		
151														4		147.15	J	35	1	Ca, Sp	3		
																147.24	J	70	1	Ca, Sp	3		

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:

DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack

INFILL TYPE: N: None Cl: Clay Qtz: Quartz FeOx: Iron Ca: Calcite NC: Non-Cohesive

ROCK MASS WEATHERING: F: Fresh SW: Slightly MW: Moderately HW: Highly CW: Completely RS: Residual Soil

JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 3: Slightly Rough, Undulating 5: Rough Undulating, Stepped 6: Very Rough, Stepped

HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-114

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m)	RUN LENGTH (m)	TCR (%)	RQD (%)	SCR (%)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS	INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm)	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
			5 10 15		25 50 75	25 50 75	25 50 75				(continued from previous page)			2 4									
152	108	38/39		1.50	99	19	83				152.0 743.5 End of Hole at: 152.0 m Shallow Monitoring Well: 50.8 mm (2") Schedule 80 PVC Standpipe with slotted screen. Screen 19.8 to 32.9 mbgl Filter pack 22.0 to 31.1 mbgl Deep Monitoring Well: 50.8 mm (2") Schedule 80 PVC Standpipe with slotted screen. Screen 98.3 to 124 mbgl Filter pack 104.4 to 122.7 mbgl Deep monitoring well installed in an offset hole. Negligible changes in lithology over the short offset distance were recorded.			4 3 6		147.28	J	45	1	Ca, Sp	3		
																147.31	J	60	1	N	3		
																147.34	J	50	1	Ca	10		
																147.37	J	80	1	N	6		
																147.43	J	60	1	Ca, Sp	6		
																147.48	J	45	1	Ca, Sp	3		
																147.52	J	50	-	Ca, Sp	10		
																147.56	J	35	>3	Ca, Sp	3		
																147.57	J	85	>3	Ca, Sp	3		
																147.59	J	60	3	Ca, Sp	3		
																147.63	J	85	<3	Ca, Sp	14		
																147.70	J	40	<3	Ca, Sp	14		
																147.84	J	40	5	Ca, Sp	14		
																147.84	J	5	3	Ca, Sp	14		
																147.86	J	35	>3	Ca, Sp	14		
																147.89	J	40	5	Ca, Sp	14		
																147.98	J	90	>5	Ca, Sp	18		
																148.03	J	45	10	Ca, Sp	3		
																148.04	J	70	3	Ca, Sp	3		
																148.12	J	35	3	Ca, Sp	3		
																148.54	J	30	>3	Ca, Sp	3		
																148.57	J	55	<3	Ca, Sp	3		
																148.62	J	70	10	Ca, Sp	3		
																148.75	J/S	45	10	Ca, Sp	3		
																148.83	J	30	1	Ca, Sp	3		
																148.88	J	60	>3	Ca, Sp	10		
																148.93	J	35	-	Ca, Sp	18		
																149.00	S	45	-	Ca, Sp	3		
																149.38	J	40	5	Ca, Sp	14		
																149.42	J	40	20	Ca, Sp	14		
																150.84	J	40	3	Sp	10		
																150.89	J	90	5	Sp	10		
																150.93	J	90	10	Sp	18		
																150.99	J	40	5	Sp	10		
																151.14	J/S	90	50	Sp	10		
																151.26	J	10	3	Sp	10		
																151.32	J	80	1	Sp	10		
																151.37	J	60	>3	Sp	10		
																151.54	J	40	5	Sp	10		
																151.59	J	20	5	Sp	10		
																151.71	J	60	3	Sp	10		
153																							
154																							
155																							
156																							
157																							
158																							
159																							
160																							

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None Cl: Clay Qtz: Quartz FeOx: Iron Ca: Calcite NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh SW: Slightly MW: Moderately HW: Highly CW: Completely RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 3: Slightly Rough, Undulating 5: Rough Undulating, Stepped 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-121

Klohn Crippen Berger

DATE STARTED: April 7, 2014	LOCATION: Kamloops, BC	BIT SIZE AND TYPE: HQ3 Impregnated Bit	SHEET 3 OF 17
DATE FINISHED: April 14, 2014	LOGGED BY: MC/LR	RIG MAKE AND MODEL: A5	GROUND ELEVATION (m): 909.3
CLIENT: KGHM International	CHECKED BY: MAB	TOTAL DEPTH (m): 150.9	COORDINATES (m): N 5609655 E 683236
PROJECT NAME: Ajax Mine Groundwater Study	DRILLING CO.: Geotech Drilling Services Ltd.	BEDROCK DEPTH (m): 10.2	COORDINATE SOURCE: KGHM
PROJECT NO.: M09871A01	DRILLER: JL	AZIMUTH/ANGLE FROM VERT.: -70	

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m) (5 10 15)	RUN LENGTH (m)	TCR (%) (25 50 75)	RQD (%) (25 50 75)	SCR (%) (25 50 75)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS	INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm) (2 4)	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
11	8	1		1.20	100	61	100	R3-R4	F		NICOLA VOLCANICS, dark greenish grey, fine to medium grained, medium strong to strong, weakly to moderately altered, iron oxide veins 10 mm thick. Unable to orient core.			4		10.25	J	40		Sp	14		
																10.36	J	15	1	Sp,FeOx,Ca	6		
														1		10.38	J	40	5	Sp,Ca	18		
																10.43	J	60	1	Sp,Ca	14		
																10.54	J	80	5	Sp,Ca	18		
														3		10.91	J	75	1	Sp,Ca,FeOx	3		
																10.93	J	60	3	Sp,Ca,FeOx	3		
														1		11.12	J	30	<3	Sp,Ca,FeOx	14		
								R0	F		11.27 m to 11.31 m: Shear zone with serpentinite, calcite and crushed rock infill					11.31	J/S	60	20	Sp,Ca,FeOx,Cx	18		
														1		11.45	J	60	5	Sp,Ca,FeOx	3		
12	9	2		1.50	87	73	87							3		11.81	J/V	70	3	Sp,Ca,FeOx	6		
																11.83	J	45	3	Sp,Ca	6		
														1		11.85	J	55	<1	Sp,Ca	6		
								R0	F		12.20 m: 10 mm thick vein, partially open					12.29	J	75	20	Sp,Ca	14		
								R0	F		12.30 m: 5 mm thick vein of chlorite(?) and calcite												
13								R3	SW														
								R3	SW		Some iron oxide stain on fractures, quartz and calcite veins up to 2 mm thick, contains magnetite. Unable to orient core.			1		13.03	J	55	1	Qtz,Ca,Sp	6		
											13.05 m: Less than 1 mm thick pyrtie stringers					13.32	J	25	3	Ca	14		
	10	2		1.50	99	67	74							2		13.40	J	45	1	Ca,Sp,FeOx	14		
																13.57	J	35	1	Ca,FeOx	6		
14														2		13.72	J	65	2	Ca,Sp,FeOx	3		
														1		14.03	J	75	2	Ca,Sp,FeOx	3		
											14.4			1		14.32	J	75	2	Ca,Sp	3		
								R3	F		894.9 PICRITE, dark green to grey, fine grained, fresh, medium strong, calcite veins up to 3 mm			1		14.58	J	75	1	Ca	3		
														1		14.84	J	60	1	Ca,Sp	10		
15	11	2/3		1.50	93	62	69									15.05	J	70	1	Ca,Sp	18		
														1		15.34	S	80	30	Ca,Sp	10		
								R2	F		15.34 m to 15.90 m: Fractured with many 1 mm thick calcite veins			4		15.44	J	55	1	Ca,Sp	6		
																15.50	J	15	3	Ca,Sp	14		
														2		15.56	J	80	10	Ca,Sp	18		
16																15.65	J	70	2	Ca,Sp	18		
								R3	F		15.90 m o 16.63 m: Closely spaced 1 mm thick calcite veins, more green than above			1		15.72	J	55	2	Ca,Sp	14		
																15.90	J	55	1	Ca,Sp	14		
														1		16.26	J	65	1	Ca,Sp	14		
	12	3		1.50	99	84	89									16.63	J	80	30	Cx,Ca	14		
								R3	F		16.63 m to 16.83 m: Fractured zones			1		16.83	J	40	40	Cx,Ca,Sp	6		
17								R3	F		16.83 m to 17.40 m: Closely spaced calcite veins and pyrite blotches, becomes speckled at 17.18 m												
								R1	F		17.40 m to 17.71 m: Fractured zone			6		17.44	J	45	3	Ca,Sp	3		
																17.49	J	65	1	N	6		
																17.54	J	80	1	Ca	3		
								S4-R0	F		17.71 m to 18.20 m: Fault, crushed rock with clayey gouge, calcite and serpentinite infill, some crushed			6		17.55	J	40	1	Ca	3		
18														6		17.78	S	45	100	Ca,Sp,Cx,Cl	1		
																18.05	S	45	300	Ca,Sp,Cx,Cl	1		

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None Cl: Clay Qtz: Quartz FeOx: Iron Ca: Calcite NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh SW: Slightly MW: Moderately HW: Highly CW: Completely RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 3: Slightly Rough, Undulating 5: Rough Undulating, Stepped 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-121

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m) (5 10 15)	RUN LENGTH (m)	TCR (%) (25 50 75)	RQD (%) (25 50 75)	SCR (%) (25 50 75)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS	INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm) (2 4)	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
											(continued from previous page)												
	13	3/4		1.50	80	0	13	R1	F		rock without clayey gouge 18.20 m to 18.90 m: Fractured zone			6		18.29	J	50	3	Ca,Cl	3		
																18.37	J	35	1	Ca,Sp	3		
																18.40	J	40	1	Ca,Sp	6		
19								R1 S4-R0	F F		18.90 m to 19.03 m: Fractured zone 19.03 m to 20.30 m: Fault, poor recovery, gravel with calcite and serpentinite infill, clayey gouge washed away during drilling			6		18.90	J	45	1	Ca,Sp	3		
	14	4		1.50	22	0	8																
20																							
								R1 R0	F F		20.30 m to 20.40 m: Fractured zone 20.40 m to 20.90 m: Fault, poor recovery, fractured rock with calcite and serpentinite infill					20.30 20.40	J J	20 20	1 1	Cl,Ca,Sp Ca,Sp	10 3		
														6									
21	15	4		1.20	71	19	33	R2	F		20.90 m to 21.60 m: Fractured zone with shear zone up to 40 mm thick			3		21.00 21.05 21.17	J J S	45 45 70	2 1 40	Cl,Ca Ca Cx,Ca	3 3 3	PT2 4 x 10-7	
														6		21.48	J	25	3	Ca,Cl	3		
	16	4		0.30	33	0	0	R2	F		21.60 m to 21.90 m: Fractured zone			6									
22								R2	F		21.90 m to 22.15 m: Core loss												
	17	4		1.09	77	0	38	R0-R2	F		22.15 m to 22.99 m: Fractured zone, chlorite(?) infill, shear zones up to 20 mm			6		22.25 22.36	J J	60 40	1 1	Ca,Sp -	3 3		
														6		22.79	J	60	1	Ca,Sp	14		
23														3		22.82	J	45	1	Ca,Sp	6		
	18	4		0.41	100	85	100	R3	F		22.99 m to 23.40 m: Less fractured					22.87	S	50	20	Cl,Cx	18		
														4		22.99	J	45	1	Ca,Sp	3		
								R2	F		23.40 m to 23.72 m: Brecciated texture					23.03	J	15	1	Ca,Sp	3		
														1		23.05	J	70	1	Ca,Sp	3		
																23.25	J	75	1	Ca,Sp	6		
														2		23.33	J	65	1	Ca,Sp	3		
24																23.85	J	75	3	Ca,Sp,T	10		
	19	5		1.50	100	55	66							1		23.91	J	75	1	Ca,Sp	10		
																24.21	J	60	1	Ca,Sp,T	3		
																24.33	S	65	10	Cl,Cx,Ca,Sp	3		
														4		24.38	J	45	2	Ca,Sp	3		
																24.48	J	90	1	Ca,Sp	3		
														6		24.53	J	80	2	Ca,Sp	3		
25								R1	F		25.06 m to 25.51 m: Fractured zone			6									
														6									
	20	5		1.50	89	23	48	R2	F		25.51 m to 26.40 m: Joints and shear zones up to 50 mm thick			2		25.73	J	40	1	Ca,T,Sp	1		
																25.89	J	70	1	Ca,T,Sp	3		
26														2		26.00	S	35	50	Cx,Cl,Ca,Sp	3		
																26.16	S	70	20	Ca,Cl,T,Ca,Sp	3		
														2		26.32	J	50	1	Sp,Ca	10		
										26.4 882.9						26.40	J	70	1	Sp,Ca	3		
								R2	F		26.40 m to 27.90 m: Fractured zone			6									
																26.76	J	70					
27														6		26.86	J	75	<1	Ca,Sp	3		
	21	5/6		1.50	94	0	28									26.91	J	75	1	Ca,Sp	10		
														5		26.95	J	75	1	Ca,Sp	3		
																27.00	J	70	1	Ca,Sp	3		
														6		27.11	J	40	1	Ca,Sp	1		
																27.14	J	65	1	Ca,Sp	3		

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None Cl: Clay Qtz: Quartz FeOx: Iron Ca: Calcite NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh SW: Slightly MW: Moderately HW: Highly CW: Completely RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 3: Slightly Rough, Undulating 5: Rough Undulating, Stepped 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-121

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m) (5 10 15)	RUN LENGTH (m)	TCR (%) (25 50 75)	RQD (%) (25 50 75)	SCR (%) (25 50 75)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS	INSTRUMENT DETAILS
											(continued from previous page)		
28	22	6		0.80	63	13	50	R2	F		27.9 / 881.4 PICRITE; fractured shear zone from top of run to 27.99 m, infilled with crushed rock, serpentinite and calcite. Unable to orient core.		
29	22	6		0.70	86	40	40	R0-R2	F		Fractured. Unable to orient core.		
30	23	6		1.20	100	8	52	R0-R2	F				
31	24	6/7		1.10	91	0	41	R0-R2 R0-R2	F F		Fractured 30.77 m to 31.25 m: Shear zone, broken and crushed rock, calcite and serpentinite infill		
32	25	7		1.00	96	0	87	R0-R2 R0-R2	F F		Fractured 31.91 m to 32.00 m: Shear zone infilled with crushed and broken rock, serpentinite and calcite		
33	26	7		1.50	100	10	81	R0-R2	F		Fractured. Unable to orient core.		
34	27	8		1.50	100	58	100	R0-R2 R3	F F		33.9 / 875.3 33.87 m to 33.93 m: Fault PICRITE; fractured. Unable to orient core.		
35													
36	28	8		0.90	98	64	74	R3	F		35.5 m to 41.65 m: Jointed		
37	29	8		1.20	77	37	48						

DISCONTINUITY DATA

FRACTURE FREQ. (No. Per 30 cm) (2 4)	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)
6		27.22	J	35			
6		27.27	J	35			
6							
6		28.70	S	75	-	Cx,Sp,Ca	3
6		28.96	S	90	60	Cx,Sp,Ca	3
		29.24	S	55	-	Cx,Sp,Ca	10
		29.40	S	-	-	Cx,Sp,Ca	10
6		29.53	S	90	130	Cx,Sp,Ca	3
6		29.72	S	-	50	Cx,Sp,Ca	18
		30.00	J	70	1	Ca,Sp	3
5		30.08	J	80	3	Ca,Sp	3
		30.15	J	85	3	Ca,Sp	3
4		30.26	J	75	<3	Ca,Sp	3
		30.30	J	30	20	Ca,Sp	3
6		30.33	J/S	65	5	Ca,Sp	3
		30.36	J/S	80	5	Ca,Sp	3
		30.39	J	60	5	Ca,Sp	10
6		30.48	J	70	-	Ca,Sp	10
		30.60	S	90	-	Cx,Ca,Sp	10
6		31.30	J	75	1	Ca,Sp	10
		31.34	J/S	55	10	Ca,Sp,Cx	14
		31.37	J	60	3	Ca,Sp	14
6		31.40	J	70	>3	Ca,Sp	14
		31.48	J	60	10	Ca,Sp	14
5		32.38	J	30	3	Ca,Sp	14
		32.40	J	45	3	Ca,Sp	14
		32.45	J	85	10	Ca,Sp	14
6		32.54	J	90	10	Ca,Sp	14
6							
		33.33	J	45	5	Ca,Sp	14
6		33.39	J	90	20	Ca,Sp	14
		33.43	J	70	10	Ca,Sp	14
2		33.45	J	45	3	Ca,Sp	14
		33.49	J	60	1	Ca,Sp	14
2		33.59	J	90	10	Ca,Sp	14
		33.67	S	45	50	Cx,Ca,Sp	18
		33.72	S	70	60	Cx,Ca,Sp	10
3		33.87	F	65	10	Ca,Sp	14
		33.93	F	90	10	Ca,Sp	14
6		33.98	J	60	>3	Ca,Sp	13
		34.04	J	45	30	Ca,Sp	6
3		34.35	J	15	5	Ca,Sp	6
		34.46	J	60	10	Ca,Sp	8
2		34.56	J	15	10	Ca,Sp	6
		34.91	J/S	80	<3	Ca,Sp	18
2		35.00	J	70	10	Ca,Sp	18
		35.19	J	90	>3	Ca,Sp	18
1		35.32	J	60	50	Ca,Cx	3
		35.45	J	55	1	Ca	3
1		35.56	J	55	10	Ca,Sp,Cx	3
		35.71	J	70	2	Ca,Sp	3
		36.06	J	80			
6		36.25	J	80			
		36.68	J	65	1	N	3
5		36.70	J	90	1	Ca,Sp	3
		36.74	J	30	1	Ca,Sp	3
2		36.90	J	75	1	Ca,Sp	3
		37.03	J	55	5	Ca,Sp,Cx	3

PERMEABILITY (m/sec)

SAMPLE RETAINED

CODES:

DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack

INFILL TYPE: N: None FeOx: Iron Cl: Clay Ca: Calcite Qtz: Quartz NC: Non-Cohesive

ROCK MASS WEATHERING: F: Fresh HW: Highly SW: Slightly CW: Completely MW: Moderately RS: Residual Soil

JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 5: Rough Undulating, Stepped 3: Slightly Rough, Undulating 6: Very Rough, Stepped

HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-121

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m)	RUN LENGTH (m)	TCR (%)	RQD (%)	SCR (%)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS
			5 10 15		25 50 75	25 50 75	25 50 75				(continued from previous page)	
38	30	9		1.50	100	21	49					
39	31	9		0.80	100	64	64					
40	32	9/10		1.50	87	34	43					
41												
42	33	10		1.50	53	33	35	R3 R0-R2	F F		41.65 m: Brecciated texture for 100 mm 41.73 m: Clayey gouge, 30 mm thick	
43								R2	F		Shear zone	
	34	10		1.50	81	25	36	R0	F		43.28 m to 43.89 m: Shear zone, rubble	
44								R0	F		43.94 m to 43.11 m: Broken core; blocked run.	
								R0	F		44.40 m to 44.85 m: Fractured	
45	35	10/11		1.50	67	7	19	R0	F		44.85 m to 45.80 m: Shear zone	
								R0	F		45.11 m to 45.90 m: Jointed	
46								R3	F	45.9 863.4	SUGARLOAF DIORITE (SLD;, fine to medium grained, porphyritic texture, dark grey, greenish, medium strong, fresh	
	36	11		1.50	100	79	95					

INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm)	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
	2 4									
			37.11	J	40	1	Ca,Sp	3		
	6		37.82	J	30	<1	Ca,Sp	3		
	2		38.02	J	30	1	N	3		
			38.16	J	80	1	Ca,Sp	3		
	4		38.24	J	70	2	Ca,T,Sp	3		
			38.30	J	75	1	Ca,Sp	3		
	6		38.33	J	30	1	Ca,Sp	3		
			38.51	J	30	1	Ca	6		
	6									
	1		39.28	J	60	2	Ca,Sp	3		
			39.45	J	60	70	Bx	3		
	2		39.52	J	65	1	Ca	3		
			39.74	J	30	1	Ca,Py	3		
	4		39.75	J	50	<1	Ca,Sp	10		
	6		39.82	J	35	1	Ca,Sp	10		
	6		39.84	J	50	1	Ca,Sp	3		
	5		40.23	J	70	5	Ca,Sp	14		
			40.31	J	25	1	T,Ca,Sp	3		
	4		40.38	J	40	1	T,Ca,Sp	3		
			40.40	J	85	1	T,Ca,Sp	3		
	1		40.44	J	0	1	Ca,Sp	3		
			40.46	J	80	<1	Ca,Sp	3		
	3		40.59	J	75	<1	N	6		
			40.70	J	80	1	Ca,Sp	3		
	2		40.73	J	50	5	Cx,Ca,Sp	6		
			40.90	J	80	10	Cx,Ca,Sp	6		
	1		41.51	J	45	1	T,Ca,Sp	3		
			41.60	J	45	1	Ca,Sp	3		
			41.73	S	55	30	Cl Cx,Ca,Sp	1		
	6		42.04	J	65	1	Cl,Ca	1		
			42.09	J	80	3	T,Ca,Sp	6		
			42.12	J	50	1	T,Ca,Sp	6		
			42.18	J	50	1	Ca	3	PT3 1 x 10-8	
	6									
			43.28	S	40	610	Cx,Cl,Ca	1		
	6									
	6		43.96	J	70	180	Bx,Ca	3		
			44.04	J	35	5	Ca,Cx	14		
	4		44.13	J	60	1	Ca,Sp	3		
			44.16	J	60	<1	T,Ca,Sp	10		
	6		44.34	J	75	1	Ca	10		
			44.37	J	60	1	Ca	3		
	6		44.53	J	60	1	Ca,Sp	3		
			44.76	J	40	1	Ca,Sp	10		
	6		44.85	S	70	780	Cx,Ca,Cl	3		
			45.63	J	55	1	N	3		
			45.74	J	70	<1	N	3		
			45.79	J	55	2	Cl,Ca	3		
	1		46.02	J	35	1	Ca,Cx,Ep	6		
	1		46.39	J	80	1	Ca	6		
			46.54	J	80	1	Ca,Sp	6		
	3		46.62	J	60	3	Ep,Py,Ca	6		
			46.70	J	80	3	Ca	6		

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None Cl: Clay Qtz: Quartz FeOx: Iron Ca: Calcite NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh SW: Slightly MW: Moderately HW: Highly CW: Completely RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 3: Slightly Rough, Undulating 5: Rough Undulating, Stepped 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-121

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m)	RUN LENGTH (m)	TCR (%)	RQD (%)	SCR (%)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS
			5 10 15		25 50 75	25 50 75	25 50 75				(continued from previous page)	
47												
48	37	11/12		1.50	95	68	70					
48.9												
49								R3	F		PICRITE; fine grained, greenish grey, medium strong, fresh	
49.4												
50	38	12		1.50	99	59	86					
51								R2	F		Fractured	
	39	12/13		1.50	93	31	59					
52								R2	F		51.27 m to 51.74 m: Fractured zone	
								R2	F		51.90 m to 53.00 m: Closely spaced joints	
	40	13		1.50	91	10	57					
53								R2	F		53.00 m to 53.16 m: Fractured zone, gravel with clay coating	
								R2	F			
								R2	F		53.16 m to 53.40 m: Closely spaced joints	
											53.40 m to 54.00 m: Closely spaced joints	
54	41	13		1.50	61	15	29	R2	F		54.00 m to 54.80 m: Fractured zone	
54.8												
55								R2	F		54.80 m to 54.90 m: Closely spaced joints	
								R3	F		54.90 m to 55.80 m: Massive, medium strong, epidote alteration, 1 mm thick calcite veins	
	42	13/14		1.50	100	62	76					
55.8								R2	F		55.80 m to 56.40 m: Jointed, fresh	
56												

INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm)	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
	2 4									
	2		47.10	J	75	3	Ca,Sp	6	Straddle 3 5 x 10-9	
			47.29	J	40	2	Ca,Sp	14		
	4		47.83	J	35	1	Ca	6		
			47.86	J	15	<1	N	6		
	3		47.88	J	85	1	Ca	3		
			47.93	J	75	30	Ca,Cx	10		
			48.07	J	15	1	Py,Ca,Ch	6		
			48.13	J	30	1	Py,Ca	6		
	2		48.28	J	70	3	Ca	14		
			48.64	J	70	2	Ca	14		
			48.67	J	70	1	Ca,Sp	6		
	1		49.28	J	75	3	Ep,Ca	6		
			49.52	J	50	2	Ca	3		
	2		49.57	J	60	5	Ca,Sp	6		
			49.82	J	40	1	Ca	6		
	4		49.88	J	35	1	Ca	10		
			49.93	J	20	1	Ca,Sp	14		
	3		50.04	J	65	3	Ca	14		
			50.13	J	40	2	Ca	3		
	2		50.24	J	55	3	Sp	3		
			50.30	J	60	2	Ca	14		
	2		50.49	J	60	1	Ca,Sp	14		
			50.61	J	70	1	Ca,Sp	3		
	3		50.79	J	60	1	Ca,Sp	3		
			50.89	J	60	3	Ca	14		
	6		51.00	J	80	5	Cx,Ca	14		
			51.20	J	70	1	Ca,Sp	14		
	2		51.74	J	35	10	Cx,Ca	14		
			51.88	J	40	1	Ca	6		
	3		51.96	J	40	1	Sp	3		
			52.16	J	60	1	Sp	3		
	4		52.24	J	70	1	Sp	3		
			52.34	J	70	1	Sp	3		
	3		52.47	J	50	1	Sp	3		
			52.71	J	55	1	Sp	10		
	6		52.80	J	65	1	Sp	3		
			52.90	J	30	1	N	3		
	6		52.98	J	65	5	Cl,Sp	3		
	3		53.52	J	55	1	Sp	10		
			53.69	J	45	5	Sp	3		
	6		53.74	J	45	1	Sp	10		
	6									
	1		55.06	J	55	1	Cl,Sp	3		
	2		55.23	J	50	2	Cl,Sp	3		
			55.36	J	60	1	Ca,Sp	3		
	5		55.80	J	55	1	Sp	10		
	6									

CODES:

DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack

INFILL TYPE: N: None Cl: Clay Qtz: Quartz FeOx: Iron Ca: Calcite NC: Non-Cohesive

ROCK MASS WEATHERING: F: Fresh SW: Slightly MW: Moderately HW: Highly CW: Completely RS: Residual Soil

JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 3: Slightly Rough, Undulating 5: Rough Undulating, Stepped 6: Very Rough, Stepped

HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-121

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m)	RUN LENGTH (m)	TCR (%)	RQD (%)	SCR (%)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS	INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm)	DISCONTINUITY DATA: FRACTURE ZONE	DISCONTINUITY DATA: DISCONT. DEPTH (m)	DISCONTINUITY DATA: DISCONT. TYPE	DISCONTINUITY DATA: ANGLE To Core Axis (TCA)	DISCONTINUITY DATA: APERTURE (<1,1-3,>3mm)	DISCONTINUITY DATA: INFILL TYPE	DISCONTINUITY DATA: JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
			5 10 15		25 50 75	25 50 75	25 50 75				(continued from previous page)			2 4									
57	43	14		1.50	100	54	78	R3	F		56.40 m to 57.11 m: Massive with 1 mm thick calcite veins			1		56.60	J	70	1	Sp	10		
								R3			57.11 m to 57.23 m: Fractured zone, gravel			6		57.27	J	30	1	Sp,Cl	3		
								R3			57.23 m to 57.90 m: Massive			4		57.41	J	65	1	Sp,Cl	3		
58								R3	F					3									
														1		58.18	J	55	1	Sp	3		
														1		58.28	J	70	1	Ca,Sp,Chl	10		
	44	14/15		1.50	100	53	100									58.52	J	75	1	N	3		
														5		58.74	J	75	1	Chl	3		
59																58.81	J	30	<1	Ca,Sp	10		
														5		58.99	J	15	1	Ca,Sp	3		
																59.15	J	35	1	Ca,Sp	10		
														4		59.17	J	65	1	Sp	3		
								R0-R3	F		Fractured					59.18	J	55	1	Ca,Sp	3		
														2		59.41	J	75	1	Ca	3		
60	44	15		1.50	98	31	67									59.64	J	75	1	Ca,Sp	3		
														6									
														6		60.29	J	60	1	Ca,Sp	3		
								R0-R3			60.30 m to 60.50 m: Shear zone, crushed rock, clayey gouge, calcite and serpentinite infill			6		60.32	J	60	1	Ca,Sp	3		
														6									
61														6		61.04	J	45	1	Ca,Sp	3		
																61.16	J	60	1	Ca,Sp	3		
														6		61.24	J	45	1	Ca,Sp	3		
	46	15		1.50	100	17	80									61.52	J	60	1	Ca	3		
														6		61.63	J	70	1	Ca,Sp	3		
62														6									
														6									
								R0-R2	F		Fractured			6		62.56	J	70	1	Ca,Sp	3		
								R0-R2	F		62.70 m to 62.88 m: Shear zone, crushed rock calcite and serpentinite infill			6		62.63	J	10	1	Ca,Sp,Cl	6		
63														6		62.95	J	45	1	Sp	3		
	47	16		1.50	91	33	72									63.03	J	55	1	Sp	3		
														6		63.19	J	60	1	Sp	3		
								R0-R2	F		63.25 m to 63.34 m: Shear zone, crushed rock, clayey gouge, calcite and serpentinite infill					63.27	J	60	1	T,Ca,Sp	3		
64								R0-R2	F		63.90 m to 64.03 m: Shear zone, broken rock, calcite and serpentinite infill			1									
								R0-R2	F		64.22 m to 64.25 m: Shear zone			1		64.17	J	40	1	Ca,Sp	3		
	48	16		1.50	100	84	84							1									
														1		64.68	J	40	1	Chl	3		
65														3									
								R0-R2	F		65.21 m to 65.25 m: Shear zone					65.22	J	75	1	Ca	6		
																65.24	J	70	1	Ca	3		
								R3	F		SUGARLOAF DIORITE (SLD); light greenish grey, weakly to moderately altered, coarse to medium grained			6		65.36	J	65	1	Ca	6		
																65.50	J	10	1	Cl	6		
66														1		65.92	J	40	1	Ca,Chl	6		

65.4
843.9

CODES:

DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack

INFILL TYPE: N: None Cl: Clay Qtz: Quartz FeOx: Iron Ca: Calcite NC: Non-Cohesive

ROCK MASS WEATHERING: F: Fresh SW: Slightly MW: Moderately HW: Highly CW: Completely RS: Residual Soil

JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 3: Slightly Rough, Undulating 5: Rough Undulating, Stepped 6: Very Rough, Stepped

HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-121

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m)	RUN LENGTH (m)	TCR (%)	RQD (%)	SCR (%)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS	INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm)	DISCONTINUITY DATA: FRACTURE ZONE	DISCONTINUITY DATA: DISCONT. DEPTH (m)	DISCONTINUITY DATA: DISCONT. TYPE	DISCONTINUITY DATA: ANGLE To Core Axis (TCA)	DISCONTINUITY DATA: APERTURE (<1,1-3,>3mm)	DISCONTINUITY DATA: INFILL TYPE	DISCONTINUITY DATA: JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
			5 10 15		25 50 75	25 50 75	25 50 75				(continued from previous page)			2 4									
	49	16/17		1.50	100	84	87							1		66.28	J	75	1	Ca,Chl	6		
																66.64	J	45	1	Ca	14		
														2		66.76	J	55	1	N	6		
67								R3-R4	F					1		66.94	J	55	1	Chl	6		
														3		67.41	J	30	1	Ca	14		
	50	17		1.50	100	61	93							6		67.49	J	20	2	Chl	14		
																67.54	J	30	1	Chl	6		
68														2		67.70	J	10	1	Ca,Ah	3		
																67.85	J	50	1	Cl	14		
								R0-R4	F					3									
																68.83	J	65	<1	N	18		
69	52	17/18		1.50	95	50	73							1									
														5		69.22	J	75	<1	Sp	10	PT4	
																69.30	J	80	<1	Sp	1	3 x 10-8	
											69.5			6									
								R0-R4	F		839.8 69.50 m to 69.65 m: Fault, rock changes from SLD to PICRITE												
											70.0			6		69.80	J	45	-	N	6		
70								R0	F		839.3 69.90 m to 70.20 m: PICRITE; fault			6									
								R4	F		70.2 839.1 70.20 m to 71.40 m: SUGARLOAF DIORITE (SLD); light pink vugging and joint infill												
														4		70.30	J	15	-	N	3		
	53	18		1.50	100	74	97									70.43	J	55	<1	N	18		
														2		70.53	J	60	<1	N	18		
																70.68	J	50	<1	Ca	6		
71														1		70.92	J	55	<1	N	6		
														2		71.20	J	40	<1	N	6		
																71.40	J	60	-	Ca,Ah	6		
								R3-R4	F					4		71.53	J	60	1	Ca	6		
																71.60	J	45	<1	Ca	6		
														2		71.76	J	55	<1	Ca	6		
72																71.91	J	75	<1	Ca	6		
	54	18/19		1.50	97	55	97							2		72.13	J	70	<1	N	6		
														3									
																72.65	J	70	<1	Ca	6		
														1		72.72	J	80	<1	N	6		
73								R3-R4	F		Light pink vugging and joint infill and voids on core surface			2		73.10	J	25	<1	Ca	10		
																73.18	J	70	<1	Ca	14		
														4		73.25	J	60	10	N	14		
	55	19		1.50	100	81	100									73.53	J	60	1	Sa,Cl	14		
														2		73.63	J	40	<1	N	10		
74														1		74.05	J	60	<1	N	18		
								R3-R4	F		Light pink veins 5 mm thick, weakly to moderately altered. Unable to orient core.			2		74.66	J	40	<1	N	3		
																75.00	J	20	<1	N	6		
75	56	19		1.50	84	77	84							2		75.24	J	60	<1	N	14		
														2		75.40	J	70	<1	N	3		

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None FeOx: Iron Cl: Clay Ca: Calcite Qtz: Quartz NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh HW: Highly SW: Slightly CW: Completely MW: Moderately RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 5: Rough Undulating, Stepped 3: Slightly Rough, Undulating 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-121

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m)	RUN LENGTH (m)	TCR (%)	RQD (%)	SCR (%)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS	INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm)	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
			5 10 15		25 50 75	25 50 75	25 50 75				(continued from previous page)			2 4									
76								R4	F		75.90 m to 76.00 m: Shear zone with broken rock infill			6		76.00	J	550	-	Ca,Ep,An	10		
														1									
	57	20		1.50	83	53	69							3		76.50	J	35	<1	N	14		
																76.60	J	60	<1	N	6		
77																							
								R0	F		77.40 m to 77.55 m: Shear zone infilled with broken rock			6									
								R0	F	77.8						77.76	J	30	3	Sa,Cx	6		
78	58	20		1.50	100	69	82	R0-R2	F	831.5	77.71 m to 77.78 m: Fault, crushed rock and clayey gouge infill			2		77.80	J	60	<1	N	6		
														6		78.00	J	0	<1	N	3		
											77.76 m to 78.90 m: PICRITE; fractured. Unable to orient core.			2									
								R0	F		78.58 m to 78.62 m: Shear zone, crushed rock, clayey gouge, serpentinite and calcite infill												
79								R0	F		78.90 m to 78.98 m: Shear zone, cruhed rock, calcite and serpentinite infill			6									
														1									
	59	20/21		1.50	100	80	93							1		79.74	J	30	<1	N	10		
																79.84	J	30	<1	Ca	6		
80														6									
														2									
								R0			80.40 m to 80.62 m: Shear zone, brocken rock, calcite and serpentinite infill			6		80.63	J	40	<1	N	3		
														1									
81	60	21		1.50	100	40	83							6		81.13	J	35	<1	N	3		
														5									
														6									
82								R2-R3	F		Fractured and jointed. Unable to orient core.			6									
														3									
								R2-R3	F		82.33 m to 82.40 m: Shear zone, broken and crushed rock, clayey gouge, calcite and serpentinite infill					82.46	J	40	<1	N	18		
	61	21/22		1.50	100	53	93							1		82.50	J	70	<1	N	3		
																82.70	J	75	<1	N	3		
83														6		83.05	J	40	<1	N	14		
														6									
								R0-R1	F		Dark grey, fine grained, extremely weak to very weak, fresh, rock is friable, fratured, striations observed on joints at 20°												
84	62			1.50	30	0	0							6									
														6		84.65	J	25	1	N	10		
														6		84.66	J	55	1	Sp	3		
																84.69	J	70	1	N	3		
85								R0 R2	F F		84.90 m to 85.00 m: Fractured			6		84.70	J	70	1	Ca,Sp	3		

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None Cl: Clay Qtz: Quartz FeOx: Iron Ca: Calcite NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh SW: Slightly MW: Moderately HW: Highly CW: Completely RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 3: Slightly Rough, Undulating 5: Rough Undulating, Stepped 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-121

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m)	RUN LENGTH (m)	TCR (%)	RQD (%)	SCR (%)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS
			5 10 15		25 50 75	25 50 75	25 50 75				(continued from previous page)	
86	63			1.50	100	51	56	R3	F		85.00 m to 85.56 m: Jointed 85.56 m to 86.40 m: Massive	
								R3	F		86.40 m to 87.23 m: Some joints, some healed microfractures at 30°	
87	64			1.50	100	83	93	R3	F		87.2 822.0 87.23 m to 87.90 m: SUGARLOAF DIORITE (SLD); fine to medium grained, mottled green, grey and white, speckled with black angular crystals, strong, fresh	
88								R4	F		Blueish grey with green and white mottling, speckled, fine to medium grained, strong, fresh, calcite veins up to 2 mm thick, trace dark grey clasts up to 15 mm diameter	
	65			1.50	97	85	94					
89												
								R4	F			
90	66			1.50	100	86	99					
91								R4	F			
	67			1.50	100	100	100					
92											92.4 816.9	
								R2	F		92.40 m to 93.30 m: PICRITE; dark greenish grey, fine grained, weak, fresh, healed microfractures up to 1 mm thick, calcite veins up to 2 mm thick	
93	68	24/25		1.50	95	53	72					
								R2	F		93.30 m to 93.90 m: Jointed	
94								R2	F		93.90 m to 94.42 m: Jointed	
	69	25		1.50	91	37	60	R2-R3	F		94.42 m to 95.40 m: Becomes stronger, less jointed	

INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm)	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
	2 4									
	4		84.76	J	20	1	Ca,Sp	3		
			84.79	J	20	1	Ca,Sp	1		
	2		84.82	J	60	1	Ca	3		
			85.15	J	55	<1	N	18		
	1		85.41	J	55	<1	N	18		
			85.70	J	45	<1	N	3		
	2		86.10	J	60	<1	N	18		
			86.24	J	65	<1	N	3		
			86.27	J	25	<1	N	3		
	1		86.55	J	80	<1	N	6		
	2									
	2		87.15	J	25	<1	N	10		
	1		87.52	J	60	<1	Ca	6		
	1		88.65	J	80	<1	Ca,Sp,Ep	6		
	3		89.05	J	45	<1	Ca,Sp	6		
			89.10	J	65	<1	Ca,Sp	6		
	1		89.20	J	55	<1	Ca,Sp	6		
	2		89.76	J	45	<1	Ca,Sp	6		
			89.95	J	40	<1	N	6		
	2		90.00	J	40	<1	N	6		
	2		90.11	J	55	<1	N	6		
	1		91.48	J	60	<1	N			
	2									
			92.05	J	60	<1	Ca,Ep	6		
			92.40	J	25	<1	N	3		
	2									
	2									
	3		92.95	J	60	<1	Ca	18		
			93.28	J	55	<1	N	18		
	5									
	2									
	6		94.02	J	50	<1	Ca	10		
			94.30	J	65	<1	N	3		
	3									
	2		94.60	J	40	<1	N	18		

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None FeOx: Iron Cl: Clay Ca: Calcite Qtz: Quartz NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh HW: Highly SW: Slightly CW: Completely MW: Moderately RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 5: Rough Undulating, Stepped 3: Slightly Rough, Undulating 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-121

(continued from previous page)

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m)	RUN LENGTH (m)	TCR (%)	RQD (%)	SCR (%)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS
95												
	70	25/26		1.50	91	37	60	R2	F		95.40 m to 96.72 m: Less jointed	
96												
97								R1	F		96.72 m to 96.90 m: Jointed	
	71	26		1.50	99	61	68	R4	F		96.90 m to 97.77 m: Jointed	
								R4	F		97.07 m: Slickensided joint	
98								R2-R3	F		97.77 m to 98.40 m: Massive	
	72	26/27		1.50	100	100	100	R3	F		98.40 m to 99.90 m: Massive, healed microfractures less than 1 mm thick, calcite veins up to 2 mm	
99												
100	73	27		1.50	100	100	100	R3	F		99.90 m to 101.23 m: Massive, vuggy, healed microfractures	
101										101.2 808.0		
	74	27/28		1.50	99	61	85	R4	F		SUGARLOAF DIORTIE (SLD); medium grained, blueish-green with white mottling, strong, fresh, less than 1 mm thick calcite veins	
								R4	F	101.6 807.6		
102								R3	F		101.63 m to 102.90 m: NICOLA VOLCANICS (NV); dark grey, fine grained, medium strong, fresh, healed microfractures	
103	75	28		1.50	100	69	91	R3	F		Abundant calcite veins up to 3 mm thick	
104												

DISCONTINUITY DATA

FRACTURE FREQ. (No. Per 30 cm): 2, 1, 2, 2, 6, 3, 2, 2, 2, 1, 1, 1, 1, 1, 2, 2, 3, 1, 6, 2, 1, 2, 3

DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)
95.25	J	70	-	Ca	6
95.30	J	70	<1	Ca	14
95.50	J	60	<1	Ca	6
95.90	J	40	<1	Ca	6
96.00	J	60	<1	N	3
96.15	J	55	<1	Ca	3
96.30	J	60	<1	N	3
96.50	J	50	<1	N	3
96.58	J	60	<1	N	3
96.70	J	50	<1	N	3
97.00	J	60	2	Ca,Sp	3
97.07	J	30	1	Ca,Sp	1
97.21	J	45	1	Ca,Sp	3
97.25	J	80	1	Ca,Sp	6
97.39	J	55	1	Ca,Chl	3
97.44	J	40	1	Ca,Chl	3
97.68	J	35	5	Ca,Cl,Cx	3
97.72	J	35	10	Cx,Ca,T	6
97.91	J	75	2	Ca,Sp	6
98.88	J	40	1	Sp	6
99.14	J	70	1	Ca,Chl	6
99.54	J	30	1	Ca	10
100.57	J	40	1	Sp	6
101.15	J	60	1	N	6
101.62	J	45	1	Ca,Sp	3
101.65	J	55	1	Ca,Sp	3
101.77	J	50	1	N	14
101.87	J	40	1	Sp	14
102.12	J	45	1	Ca	3
102.21	J	35	1	Sp	3
102.32	J	60	1	Sp	3
102.45	J	45	1	Ca,Sp	6
103.12	J	75	2	Ca	6
103.22	J	55	1	Ca	6
103.45	J	80	1	Ca	18
103.76	J	50	1	Ca,Sp	3
103.80	J	60	3	Ca,Sp	14
104.14	J	10	1	Ca,Sp	3
104.23	J	25	1	N	3

CODES:

DISCONT. TYPE: J: Joint, B: Bedding, S: Shear, T: Tension Crack

INFILL TYPE: N: None, Cl: Clay, Qtz: Quartz, FeOx: Iron, Ca: Calcite, NC: Non-Cohesive

ROCK MASS WEATHERING: F: Fresh, SW: Slightly, MW: Moderately, HW: Highly, CW: Completely, RS: Residual Soil

JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled, 1: Smooth, Planar, 3: Slightly Rough, Undulating, 5: Rough Undulating, Stepped, 6: Very Rough, Stepped

HARDNESS: R0: Extremely Weak (<1), R1: Very Weak (1-5), R2: Weak (5-25), R3: Medium Strong (25-30), R4: Strong (50-100), R5: Very Strong (100-250), R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-121

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m)	RUN LENGTH (m)	TCR (%)	RQD (%)	SCR (%)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS	INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm)	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
			5 10 15		25 50 75	25 50 75	25 50 75				(continued from previous page)			2 4									
								R4	F		104.40 m to 105.06 m: Fewer calcite veins			1		104.26	J	45	1	Ca,Sp	18		
																104.61	J	50	1	Ca	3		
105														1		104.94	J	55	1	Ca	3		
	76	28/29		1.50	100	84	99	R4	F		105.06 m to 105.55 m: Epidote alteration, blotches of altered rock up to 15 mm diameter					105.06	J	35	3	Ca,Sp	3		
														1		105.27	J	60	1	Ca,Sp	10		
														3		105.38	J	60	<1	Ca,Sp	3		
								R4	F		Fewer calcite veins					105.54	J	50	1	Ca,Sp	10		
106														1		105.77	J	30	1	Ca,Sp	14		
								R3	F		105.90 m to 107.40 m: Few calcite veins, blotches of pink mineral (feldspar?), massive												
														1		106.48	J	40	1	Ca	3		
	77	29		1.50	100	100	100																
																106.89	J	65	1	Ca	3		
107														1		107.12	J	50	1	Ca	3		
														1									
								R4	F		107.40 m to 108.73 m: Chlorite/epidote alteration												
108																							
	78	29/30		1.50	99	99	99																
														1		108.45	J	70	1	Ca	3		
														1		108.72	J	45	3	Ca	10		
								R4	F		108.73 m to 108.90 m: Becomes dark purplish grey												
109								R3	F		108.90 m to 109.00 m: Purplish grey rock			2		109.04	J	55	2	Ca	3		
									F		109.00 m to 110.40 m: Abundant calcite veins up to 3 mm thick, massive					109.07	J	50	2	Ca	6		
														1		109.39	J	65	1	N	3		
	79	30		1.50	99	96	96							1								Straddle 2 6 x 10-9	
																109.79	J	65	1	N	18		
110																							
																110.13	J	80	1	Ca,Sp	3		
														3		110.27	J	30	1	Ca,Sp	6		
								R3	F		110.40 m to 111.90 m: With calcite veins up to 5 mm thick, massive					110.40	J	30	1	Ca,Sp	6		
														1									
111																111.00	J	60	1	Ca	14		
	80	30/31		1.50	100	100	100							1		111.28	J	45	1	Ca,Sp	14		
														1		111.88	J	55	1	Ca,Sp	14		
112								R3	F		119.00 m to 113.40 m: Dark green, fine grained, medium strong, fresh, moderately altered												
																112.48	J	45	1	N	3		
	81	31		1.50	82	78	82							1									
113																112.84	J	70	1	Ca	3		
														2		112.90	J	45	1	Ca,Sp	6		
																113.10	J	65	1	Ca,Sp	6		
														1									
								R3	F					6		113.56	J	70	1	Ca,Sp	18		
														1									

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None Cl: Clay Qtz: Quartz FeOx: Iron Ca: Calcite NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh SW: Slightly MW: Moderately HW: Highly CW: Completely RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 3: Slightly Rough, Undulating 5: Rough Undulating, Stepped 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-121

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m) 5 10 15	RUN LENGTH (m)	TCR (%) 25 50 75	RQD (%) 25 50 75	SCR (%) 25 50 75	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS	INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm) 2 4	DISCONTINUITY DATA: FRACTURE ZONE	DISCONTINUITY DATA: DISCONT. DEPTH (m)	DISCONTINUITY DATA: DISCONT. TYPE	DISCONTINUITY DATA: ANGLE To Core Axis (TCA)	DISCONTINUITY DATA: APERTURE (<1,1-3,>3mm)	DISCONTINUITY DATA: INFILL TYPE	DISCONTINUITY DATA: JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
											(continued from previous page)												
	82	31		1.50	100	74	85							1		113.97	J	70	1	Ca,Sp	10		
																114.25	J	45	2	Ca	14		
														2		114.38	J	85	1	Sp	3		
																114.56	J	75	2	Ca,Sp	14		
														5		114.62	J	35	1	Sp	3		
115								R3	F		Jointed					114.78	J	55	1	Ca,Sp	14	PT5 5 x 10-9	
																114.90	J	15	1	Ca,Sp	10		
														2		115.05	J	50	1	Ca,Sp	10		
																115.08	J	40	1	Ca,Sp	10		
														3		115.25	J	30	3	Ca,Sp	6		
	80	31/32		1.50	100	57	67									115.34	J	40	1	Ca,Sp	6		
														3		115.45	J	45	1	Ca,Sp	6		
116																115.68	J	50	1	Ca,Sp	6		
														3		115.72	J	35	2	Ca,Sp	6		
																115.76	J	40	1	Ca,Sp	6		
														3		115.92	J	20	1	Ca,Sp	6		
								R3	F		Massive					116.23	J	50	1	Ca,Sp	6		
																116.29	J	30	1	Ca,Sp	6		
																116.74	J	60	1	Ca,Sp	6		
117														1									
	84	32		1.50	100	94	94									117.03	J	45	1	Ca	6		
														3		117.17	J	65	1	Ca	14		
																117.25	J	20	1	Ca	6		
																117.28	J	50	1	Ca	14		
														2									
118								R3	F		Massive					117.90	J	50	1	Ca	6		
	85	33		1.50	100	100	100							1		118.33	J	35	1	Ca	10		
																118.71	J	55	1	Ca	18		
119														1		118.88	J	45	1	Ca	14		
																119.15	J	10	2	Ca	18		
														2		119.20	J	75	1	Ca	10		
								R3	F		1 mm to 5 mm thick veins, blotches of pink mineral (feldspar?). Unable to orient core.												
																119.76	J	80	1	Ca	3		
120														1									
	83	33		1.50	100	100	100									120.10	J	70	1	Ca	10		
										120.2 789.1				1									
								R3-R4	F		SUGARLOAF DIORITE (SLD); medium grained, blueish-green with white mottling, strong, fresh, less than 1 mm thick calcite veins. Unable to orient core.					120.34	J	50	1	Ca	14	Straddle 1 1 x 10-7	
														1		120.54	J	60	1	N	14		
														5		120.80	J	45	1	Ca	6		
121								R4	F		Jointed. Unable to orient core.					120.95	J	55	1	Ca	10		
														5		120.99	J	75	1	Ca	6		
																121.10	J	45	1	Ca	3		
								R4	F		121.33 m to 121.50 m: Shear zone, broken rock, calcite and serpentinite infill			6		121.18	J	40	1	Ca	3		
	86	33/34		1.50	100	51	89									121.30	J	40	1	Ca	3		
														4		121.33	J	50	1	Ca	3		
122																121.55	J	45	1	Ca	6		
														6		121.64	J	50	1	Ca	6		
																121.75	J	50	1	Ca	14		
																121.93	J	40	1	Ca,Py	3		
								R3-R4	F		Jointed			1									
																122.69	J	70	1	Ca	3		
123																							
	87	34		1.50	99	91	95							1		123.12	J	70	1	Ca	10		
														2		123.39	J	70	1	Ca	14		

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None Cl: Clay Qtz: Quartz FeOx: Iron Ca: Calcite NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh SW: Slightly MW: Moderately HW: Highly CW: Completely RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 3: Slightly Rough, Undulating 5: Rough Undulating, Stepped 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-121

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m)	RUN LENGTH (m)	TCR (%)	RQD (%)	SCR (%)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS
			5 10 15		25 50 75	25 50 75	25 50 75				(continued from previous page)	
124								R3-R4	F		Jointed	
	88	34/35		1.50	100	93	100					
125												
											125.4	
								R4	F		783.9 PICRITE; jointed	
								R4	F		125.53 m to 125.60 m: Shear zone, broken rock, calcite and serpentinite infill	
126	89	35		1.50	100	36	93	R3	F		126.1 783.1 SUGARLOAF DIORITE (SLD); light to dark grey, white and pink mottling, fine to medium grained, fresh, medium strong, jointed and fractured	
											126.9	
127								R0	F		782.4 126.90 m to 127.17 m: Fault, altered PICRITE, clay,	
								R3	F		127.2 782.1 broken and crushed rock infill	
	90	35/36		1.50	100	69	94				SUGARLOAF DIORITE (SLD); Jointed	
128												
								R4	F			
129	91	36		1.50	92	62	92					
130								R4	F		Greenish grey, medium grained, strong, fresh, massive	
	92	36/37		1.50	95	95	95					
131												
								R4	F			
132	93	37		1.50	100	93	100					
133								R4	F		Chlorite/epidote alteration	

INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm)	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
	2 4									
	1		123.59	J	70	1	Ca	10		
	1		123.79	J	60	1	Ca	10		
	2		124.10	J	50	1	Ca	10		
	1		124.38	J	75	1	N	10		
	1		124.48	J	70	2	Ca	14		
	1		124.59	J	70	1	Ca	18		
	1		125.00	J	55	1	Ca	3		
	1		125.32	J	60	1	Ca	14		
	6									
	6									
	4		126.25	J	40	3	Ca	6		
	2		126.36	J	40	3	Ca,Cl	14		
			126.48	J	55	5	Ca	10		
	3		126.73	J	30	2	Ca,Cl	3		
			126.80	J	25	1	Cl	14		
	6		127.17	J	40	1	Cl	3		
	4		127.27	J	50	1	Ca,Sp	10		
	2		127.60	J	50	1	N	14	PT6 8 x 10-9	
	2		127.65	J	80	1	Ca	3		
	1		127.72	J	60	1	N	3		
			127.90	J	70	2	Ca	6		
			128.11	J	75	1	Ca	6		
			128.33	J	55	1	Ca	6		
	4		128.47	J	60	1	Chl,Ep	3		
	2		128.60	J	70	1	Chl,Ep	3		
			128.70	J	70	1	Ca,Chl	10		
	1		128.74	J	85	3	Ca	14		
			128.82	J	60	1	Ca	10		
			128.93	J	75	1	Ca	10		
			129.26	J	55	1	Ca	6		
	1		130.32	J	65	1	Ca	6		
	1								PT8 3 x 10-9	
	1		130.79	J	65	1	Ca	6		
			130.91	J	65	1	Ca	6		
			131.40	J	35	1	Ca,Ep	3		
	1		131.66	J	75	1	Ca	3		
	3		131.70	J	55	1	Ca	3		
			131.87	J	55	1	Ca,Sp	3		
	1		132.10	J	60	1	Ca	3		
			132.27	J	55	1	Ca,Sp	3		
	2		132.46	J	60	1	N	6		
			132.52	J	80	3	T	3		
			132.67	J	60	2	Ca	3		

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None Cl: Clay Qtz: Quartz FeOx: Iron Ca: Calcite NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh SW: Slightly MW: Moderately HW: Highly CW: Completely RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 3: Slightly Rough, Undulating 5: Rough Undulating, Stepped 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-121

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m) (5 10 15)	RUN LENGTH (m)	TCR (%) (25 50 75)	RQD (%) (25 50 75)	SCR (%) (25 50 75)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION (continued from previous page)	DRILLING REMARKS	INSTRUMENT DETAILS
134	94	37/38		1.50	97	97	97	R4	F		Unable to orient core.		
135	95	38		1.50	100	100	100	R4	F		134.94 m to 135.60 m: Altered, banded appearance		
								R4	F		135.60 m to 135.90 m: Chlorite alteration, some pyrite		
136								R4	F		Chlorite/epidote alteration		
	96	38/39		1.50	96	75	91						
137								R4	F		Epidote alteration, blotches and bands of feldspar		
								R4	F		Epidote alteration, blotches of feldspar		
138	97	39		1.50	100	97	100						
139													
	98	39/40		1.50	100	100	100						
140													
								R4	F		Layered SUGARLOAF DIORITE (SLD) and PICRITE. Unable to orient core.		
141	99	40		1.50	96	71	91						
142								R4	F				

DISCONTINUITY DATA

FRACTURE FREQ. (No. Per 30 cm) (2 4)	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)
1		133.14	J	70	2	N	3
1							
1							
1		134.83	J	45	1	N	6
1		135.34	J	60	1	Ca,Chl	6
1		135.58	J	60	10	Qtz,T	14
2		135.70	J	65	1	Ep	14
4		136.03	J	60	1	Ca	6
		136.05	J	35	1	Ca,Chl	6
2		136.10	J	35	<1	Ca	6
		136.14	J	60	1	Ca	6
2		136.42	J	60	2	Ca	6
		136.45	J	15	1	Ca	6
		136.63	J	65	1	N	6
1		136.75	J	45	5	Ca,Cx	3
1		137.11	J	45	1	Ca,Ca	6
		137.19	J	70	2	Ca	6
2		137.46	J	60	1	Ca	3
		137.63	J	60	2	Ca	6
1		137.91	J	75	2	Ca	6
1		138.17	J	55	2	Ca	3
1		138.39	J	65	2	Ca	3
1		138.67	J	70	1	Ca	3
1		138.90	J	55	2	Ca	3
1		139.10	J	75	2	Ca	3
1		140.03	J	70	1	Ca	3
		140.40	J	50		Ca	6
2		140.58	J	65	1	Ca	6
1		140.91	J	65	1	N	14
		140.99	J	60	1	Ca	3
3		141.10	J	60	1	N	8
		141.25	J	40	1	Ca	6
2		141.77	J	55	2	Ca	6
		141.80	J	55	2	Ca	6
1		142.02	J	60	1	Ca	3
		142.23	J	70	1	Ca	3
3		142.37	J	70	1	N	3
		142.45	J	55	1	Ca	3

PERMEABILITY (m/sec)

SAMPLE RETAINED

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:

DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack

INFILL TYPE: N: None FeOx: Iron Cl: Clay Ca: Calcite Qtz: Quartz NC: Non-Cohesive

ROCK MASS WEATHERING: F: Fresh HW: Highly SW: Slightly CW: Completely MW: Moderately RS: Residual Soil

JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 5: Rough Undulating, Stepped 3: Slightly Rough, Undulating 6: Very Rough, Stepped

HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-121

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m)	RUN LENGTH (m)	TCR (%)	RQD (%)	SCR (%)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS
			5 10 15		25 50 75	25 50 75	25 50 75				(continued from previous page)	
143	100	40/41		1.50	100	73	100					
								R4	F			
144	101	41		1.50	95	95	95					
											144.9	
145								R4	F		764.4 NICOLA VOLCANICS (NV); dark greenish grey, fine to medium grained, fresh, strong, calcite and epidote veins <1 mm to 3 mm thick	
	102	41/42		1.50	100	93	100					
146											146.4	
								R4	F		762.9 Layered SUGARLOAF DIORITE (SLD) and PICRITE	
147	103	42		1.50	100	100	100					
148								R4	F		147.90 m to 147.98 m: Shear zone with broken rock infill. Unable to orient core.	
	104	42/43		1.50	100	73	89					
149											149.4	
								R4	F		759.9 NICOLA VOLCANICS (NV); dark greenish grey, fine to medium grained, fresh, strong, calcite and epidote veins <1 mm to 3 mm thick	
150	105	43		1.50	100	100	100					
											150.9	
151											758.4 End of Hole at: 150.9 m	
											Monitoring Well Installation 50.8 mm (2") Schedule 80 PVC Standpipe with slotted screen. Screen 141.9 to 150.9 mbgl	
152												

INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm)	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
	2 4									
	2		142.55	J	55	1	Ca	3		
	5		142.70	J	60	1	Ca	3		
			142.90	J	30	1	N	3		
			142.98	J	70	1	Ca	6		
	2		143.20	J	70	3	Ca	14		
			143.32	J	45	2	Ca	10		
	1		143.60	J	60	1	Ca	6		
	1		144.25	J	80	1	Ca	10		
	1		144.54	J	70	1	N	6		
			144.92	J	70	1	Cl	6		
	3		145.10	J	50	1	Ca	3		
			145.50	J	60	1	Ca	3		
	1									
	1		146.01	J	75	1	Ca	6		
			146.12	J	65	1	Ca	14		
	1									
	1		146.43	J	70	1	Ca	18	PT7 2 x 10-7	
	1									
	1		146.96	J	45	1	Ca	10		
	1		147.15	J	55	1	Ca	10		
	2		147.43	J	55	1	N	18		
	2		147.74	J	80	1	N	18		
			147.86	J	50	1	Ca	6		
	1		147.97	J	35	1	N	3		
	1									
			148.47	J	80	1	Ca	3		
	2		148.93	J	40	1	Ca,Chl	3		
			149.13	J	35	1	Ca	3		
	6		149.22	J	35	2	Ca	6		
			149.27	J	70	1	Ca	6		
			149.34	J	65	1	Ca	6		
			149.71	J	75	1	Ca	3		
	1									
	1		150.18	J	60	1	Ca	3		
	1		150.46	J	70	1	Ca	18		
	2		150.65	J	70	2	Ca	14		
			150.77	J	55	1	Ca,Cl	6		

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:

DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack

INFILL TYPE: N: None FeOx: Iron Cl: Clay Ca: Calcite Qtz: Quartz NC: Non-Cohesive

ROCK MASS WEATHERING: F: Fresh HW: Highly SW: Slightly CW: Completely MW: Moderately RS: Residual Soil

JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 5: Rough Undulating, Stepped 3: Slightly Rough, Undulating 6: Very Rough, Stepped

HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-121

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m) 5 10 15	RUN LENGTH (m)	TCR (%) 25 50 75	RQD (%) 25 50 75	SCR (%) 25 50 75	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION (continued from previous page)	DRILLING REMARKS	INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm) 2 4	DISCONTINUITY DATA: FRACTURE ZONE	DISCONTINUITY DATA: DISCONT. DEPTH (m)	DISCONTINUITY DATA: DISCONT. TYPE	DISCONTINUITY DATA: ANGLE To Core Axis (TCA)	DISCONTINUITY DATA: APERTURE (<1,1-3,>3mm)	DISCONTINUITY DATA: INFILL TYPE	DISCONTINUITY DATA: JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
153											Filter pack 144.1 to 150.2 mbgl												
154																							
155																							
156																							
157																							
158																							
159																							
160																							
161																							

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None FeOx: Iron Cl: Clay Ca: Calcite Qtz: Quartz NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh HW: Highly SW: Slightly CW: Completely MW: Moderately RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 5: Rough Undulating, Stepped 3: Slightly Rough, Undulating 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-124

Klohn Crippen Berger

DATE STARTED: April 14, 2014	LOCATION: Kamloops, BC	BIT SIZE AND TYPE: HQ3 Impregnated Bit	SHEET 4 OF 21
DATE FINISHED: April 26, 2014	LOGGED BY: MC/MS	RIG MAKE AND MODEL: A5	GROUND ELEVATION (m): 903.7
CLIENT: KGHM International	CHECKED BY: MAB	TOTAL DEPTH (m): 250.0	COORDINATES (m): N 5609491 E 683316
PROJECT NAME: Ajax Mine Groundwater Study	DRILLING CO.: Geotech Drilling Services Ltd.	BEDROCK DEPTH (m): 22.0	COORDINATE SOURCE: KGHM
PROJECT NO.: M09871A01	DRILLER: JL	AZIMUTH/ANGLE FROM VERT.: -70	

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m) (5 10 15)	RUN LENGTH (m)	TCR (%) (25 50 75)	RQD (%) (25 50 75)	SCR (%) (25 50 75)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS	INSTRUMENT DETAILS
23	11	2		1.50	100	0	16	R1	SW		MAFIC VOLCANICS: Broken core. Unable to orient core.	Broken core, no discontinuity data from 23.50 m to 31.10 m	
24	12	2/3		1.50	80	16	16						
25	13	3		1.50	47	0	7						
26													
27	14	3		1.50	53	14	25						
28													
29	15	3/4		1.50	80	0	14						

DISCONTINUITY DATA

FRACTURE FREQ. (No. Per 30 cm) (2 4)	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)
3		22.23	S	15	>30	Cl, Ca	1
3		22.29	J	40	<1	Cl, Sp	1
6		22.32	J	65	1	N	14
		22.49	J	55	<1	N	18
6		22.57	J	70	<1	Sp, Py	10
		22.62	J	30	<1	Sp, Py	3
6		23.07	J	15	<1	N	6
		23.15	J	35	<1	N	18
		23.25	J	60	2	Ca, Sp	10
		23.30	J	30	<1	Cl	1
		23.34	J	55	1	Sp	3
		23.43	J	60	<1	Sp	3
		23.45	J	45	<1	Sp	3
		23.48	J	40	<1	Sp	18
		23.50	J	35		Sp	18

PERMEABILITY (m/sec)

SAMPLE RETAINED

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:

DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack

INFILL TYPE: N: None Cl: Clay Qtz: Quartz FeOx: Iron Ca: Calcite NC: Non-Cohesive

ROCK MASS WEATHERING: F: Fresh SW: Slightly MW: Moderately HW: Highly CW: Completely RS: Residual Soil

JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 3: Slightly Rough, Undulating 5: Rough Undulating, Stepped 6: Very Rough, Stepped

HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-124

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m)	RUN LENGTH (m)	TCR (%)	RQD (%)	SCR (%)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS	INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm)	DISCONTINUITY DATA: FRACTURE ZONE	DISCONTINUITY DATA: DISCONT. DEPTH (m)	DISCONTINUITY DATA: DISCONT. TYPE	DISCONTINUITY DATA: ANGLE To Core Axis (TCA)	DISCONTINUITY DATA: APERTURE (<1,1-3,>3mm)	DISCONTINUITY DATA: INFILL TYPE	DISCONTINUITY DATA: JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
			5 10 15		25 50 75	25 50 75	25 50 75				(continued from previous page)			2 4									
31	16	4		1.50	33	0	2																
	17	4		1.50	100	55	73	R1	SW		31.00 m to 31.80 m: Small shear zone			2		31.10	S	90	>3	Go			
32														3		31.25	J	75	<1	Ca	10		
																31.30	J	85	2	Ca	8		
														1		31.43	J	80	<1	N	6		
																31.50	S	75	>3	Go	9		
														2		31.72	J	75	<1	Ca			
																31.92	J	65	<1	Ca	5		
														2		32.05	J	80	<1	Ca	6		
																32.06	J	25	<1	Ca	6		
								R3	F							32.25	J	15	<1	Ca	8		
33	18	5		1.50	100	97	97							2		32.83	J	50	1-3	Ca	10		
																32.90	J	60	1-3	N	14		
														1		33.25	J	65	<1	N	8		
34								R3	F		PICRITE												
	19	5		1.50	87	41	44				34.00 m to 34.80 m: Broken Zone			6									
35														6									
														6									
																35.30	J	20	<1	Cl	11		
								R3	F		Alteration visible along jointing	Drillers cannot orient the core		1		35.62	J	60	1-3	Cl	10		
														2		35.73	J	30	<1	Cl	8		
36														1		35.90	J	80	1-3	N	16		
	20	6		1.50	93	59	67							1		36.25	J	25	>3	Go			
														2		36.54	J	50	1-3	N	8		
																36.60	J	5	<1	Ca	8		
37														6									
														6									
														1		37.54	J	45	1-3	Ca	20		
														1		37.70	J	40	<1	Sp	12		
38	21	6		1.80	100	69	76							2		38.10	J	15	<1	Cl	8		
																38.14	J	45	<1	N	10		
														4		38.22	J	45	<1	N	6	PT1	
																38.37	J	50	<1	N	6	6 x 10-9	
														1		38.40	J	35	<1	Ca	10		
																38.50	J	55	<1	N	14		
39														1		38.72	J	80	1-3	Ca	14		
																39.05	J	20	<1	Cl	5		
											39.1					39.20	J	50	<1	N	14		
	22	7		1.20	83	41	59				864.6			3		39.25	J	40	1-3	N	12		
																39.30	J	40	<1	Sp	8		

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:

DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack

INFILL TYPE: N: None Cl: Clay Qtz: Quartz FeOx: Iron Ca: Calcite NC: Non-Cohesive

ROCK MASS WEATHERING: F: Fresh SW: Slightly MW: Moderately HW: Highly CW: Completely RS: Residual Soil

JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 3: Slightly Rough, Undulating 5: Rough Undulating, Stepped 6: Very Rough, Stepped

HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-124

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m)	RUN LENGTH (m)	TCR (%)	RQD (%)	SCR (%)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS
			5 10 15		25 50 75	25 50 75	25 50 75				(continued from previous page)	
40												Drillers cannot orient the core
	23	7		1.50	100	79	100					
41												
42	24	7/8		1.50	100	49	70					
43								R2	F		MAFIC VOLCANICS, fine grained, dark grey, weak, fresh, calcite veins up to 2 mm thick, trace pyrite	
	25	8		1.50	100	94	94					
44												
45	26	7/8		1.50	87	51	59					
								R2	F		45.50 m to 45.70 m: Pyrite nodules up to 10 mm in diameter	
								R2	F			
46								R0	F		45.70 m to 46.00 m: Fractured zone, poor recovery, crushed rock with clayey gouge 46.00 m to 46.70 m: Shear zone, crushed rock with clayey gouge infill	
	27	9		1.50	75	19	32	R2	F		46.7 m / 857.0 m PICRITE, fine grained, dark grey, weak, fresh, jointed, calcite veins less than 1 mm thick	
47												
48	28	9		1.50	51	0	5	R0	F		48.05 m to 49.00 m: Shear zone, crushed rock and clay with serpentinite on fracture surfaces	
49												

INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm)	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
	2 4									
	3		39.50	J	60	1-3	Sp	16		
	2		39.57	J	30	<1	N	16		
			39.60	J	40	1-3	N	16		
			39.70	J	40	<1	N	6		
			39.80	J	30	<1	N	7		
	2		40.50	J	45	<1	N	3		
	2		40.55	J	60	<1	N	14		
			40.64	J	60	1-3	N	16		
	3		40.74	J	40	1-3	Ca	10		
			40.90	J	25	<1	Ca	6		
			41.03	J	70	<1	N	10		
			41.16	J	30	<1	N	8		
	2		41.55	J	10	<1	Ca	7		
			41.67	J	50	<1	N	18		
	6									
	6									
	6		42.48	J	10	<1	N	14		
			42.52	J	40	<1	N	8		
	1		43.06	J	15	1	Cl, Sp	3		
	1									
	1		43.48	J	75	<1	Sp	14		
	1		43.67	J	30	<1	Sp	6		
	1		44.09	J	60	<1	Py	18		
	1		44.33	J	20	<1	Py	6		
	1		44.63	J	80	<1	Cl,Sp	3		
	1		44.94	J	80	1	Ca,Sp	14		
	1		45.13	J	15	<1	Ca,Sp	6		
	1		45.51	J	45	<1	Sp	6		
	1		45.67	J	45	<1	Cl, Sp	1		
	6									
	6		46.51	S	70	>100	Cl,Ca	1		
			46.64	S	50	120	Cl,Ca	1		
	3		46.74	J	55	<1	Cl	3		
			46.82	J	45	<1	N	6		
	3		46.98	J	60	<1	N	6		
			47.01	J	80	<1	N	6		
	1		47.08	J	55	<1	Sp	6	PT2	
			47.15	J	60	Cl	Ca	3	2 x 10-7	
	3		47.28	J	60	<1	N	3		
			47.40	J	60	<1	N	3		
	4		47.45	J	20	<1	N	3		
			47.54	J	50	<1	N	3		
			47.64	J	20	<1	Ca	6		
			47.70	J	55	2	Py	6		
			47.85	J	55	<1	Ca	6		
			47.91	J	60	<1	N	10		
	6		47.95	J	40	<1	N	3		
			48.10	S	25	>30	Py	3		
							Cl, Ca, Sp	1		

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:

DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack

INFILL TYPE: N: None FeOx: Iron Cl: Clay Ca: Calcite Qtz: Quartz NC: Non-Cohesive

ROCK MASS WEATHERING: F: Fresh HW: Highly SW: Slightly CW: Completely MW: Moderately RS: Residual Soil

JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 5: Rough Undulating, Stepped 3: Slightly Rough, Undulating 6: Very Rough, Stepped

HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-124

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m)	RUN LENGTH (m)	TCR (%)	RQD (%)	SCR (%)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS	INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm)	DISCONTINUITY DATA: FRACTURE ZONE	DISCONTINUITY DATA: DISCONT. DEPTH (m)	DISCONTINUITY DATA: DISCONT. TYPE	DISCONTINUITY DATA: ANGLE To Core Axis (TCA)	DISCONTINUITY DATA: APERTURE (<1,1-3,>3mm)	DISCONTINUITY DATA: INFILL TYPE	DISCONTINUITY DATA: JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
			5 10 15		25 50 75	25 50 75	25 50 75				(continued from previous page)			2 4									
50	29	9/10		1.50	74	23	28	R0 R0	F F		49.00 m to 49.84 m: Shear zone, clayey gouge, sand, and crushed rock, serpentinite infill on fractures 49.84 m to 50.50 m: Jointed Picrite			6 6		49.84 49.93 50.06 50.11 50.37	S J J J J	60 30 30 50 50	>80 <1 <1 10 <1	Cl, Ca, Sa, Sp Sp Ca Ca Ca	1 6 6 14 14		
51	30	10		1.50	100	0	37		F		50.50 m to 52.00 m: Broken rock mass Unable to orient core			6		50.70	J	70	1-3	N	6		
52	31	10		1.50	53	4	4		SW		52.00 m to 53.50 m: Poor recovery and pyrite in quartz and calcite veins			6									
53														6									
54	32	10/11		1.50	73	15	17							6		54.50 54.55	J J	45 0	1-3 1-3	Qz Qz	8 8		
55														6									
56	33	11		1.50	80	23	33							2 2 6		55.35 55.50 55.63 55.75	J J J J	35 75 60 30	1-3 >3 >3 <1	Qz Qz Go Go	4 4		
57	34	11		1.50	100	32	47		F					2 3 6		56.30 56.50 56.85 57.03 57.07 57.14	J J J J J J	30 35 40 80 20 80	<1 <1 1-3 <1 <1 <1	Qz Qz N Qz Qz Qz	4 4 16 2 2 4		
58									SW		58.00 m to 59.50 m: Network of veinlets, pyrite in veins			6 3 3		58.13 58.20 58.30 58.45	J J J J	10 80 35 40	1-3 1-3 1-3 <1	Qz Qz Qz Qz	10 6 10 10		

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:

DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack

INFILL TYPE: N: None Cl: Clay Qtz: Quartz FeOx: Iron Ca: Calcite NC: Non-Cohesive

ROCK MASS WEATHERING: F: Fresh SW: Slightly MW: Moderately HW: Highly CW: Completely RS: Residual Soil

JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 3: Slightly Rough, Undulating 5: Rough Undulating, Stepped 6: Very Rough, Stepped

HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-124

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m)	RUN LENGTH (m)	TCR (%)	RQD (%)	SCR (%)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS
			5 10 15		25 50 75	25 50 75	25 50 75				(continued from previous page)	
59	35	12		1.50	100	21	34					
									SW		59.50 m to 61.00 m: Heavily fractured, network of tight fractures, approximately three perpendicular joint sets	
60	36	12		1.50	100	17	33					
61									F			
	37	12		1.50	73	27	29					
62												
									SW		62.50 m to 64.00 m: Contact with iron rich rock	
63	38	13		1.50	13	0	5					
64									SW		64.00 m to 65.50 m: Iron rich rock and breccia	
	39	13		1.50	73	67	67					
65												
									F		65.50 m to 66.70 m: Very poor recovery, washed gravel with serpentinite on fractures	
66	40	13		1.50	41	0	5					
67											PICRITE, closely spaced tight joints	
									F		67.00 m to 67.67 m: Shear zone, crushed rock with clay coating	
	41	13/14		1.50	95	0	9					
68											67.67 m to 68.50 m: Broken core, joints with calcite and serpentinite	

INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm)	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
	2 4									
	3		58.48	J	50	<1	Qz	12		
	3		58.57	J	35	1-3	Qz	14		
	6		58.70	J	85	1-3	Qz	10		
	6		58.75	J	5	1-3	Qz	10		
	6		58.86	J	10	1-3	Qz	18		
	6		58.90	J	30	1-3	Qz	6		
	6		59.00	J	20	<1	Qz	14		
	6		59.07	J	30	<1	Qz	6		
	6									
	6									
	6									
	3		60.80	J	80	1-3	N	8		
	3		60.86	J	70	1-3	Qz	8		
	1									
			61.28	J	75	1-3	N	8		
	6		61.38	J	75	<1	N	6		
			61.40	J	20	<1	Qz	8		
	3		61.45	J	75	<1	N	10	PT3 8 x 10-9	
			61.57	J	80	<1	N	6		
	6		61.60	J	80	<1	Qz	8		
			61.70	J	20	<1	Qz	8		
			61.75	J	60	<1	Qz	8		
			61.79	J	5	1-3	Qz	6		
			65.40	S	5	>3	Go			
	6		66.76	J	25	<1	Sp	3		
			66.87	J	30	1	Cx,Sp	3		
			67.00	S	50	>3	Cl,Cx,Sp	1		
	6		67.11	J	35	<1	Cl,Sp			
			67.33	J	50	<1	Cl,Ca			
	6		67.44	J	50	<1	Cl,Ca			
	6		67.73	J	25	2	Cl			
			67.77	J	25	1	Cl			
	6									

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None Cl: Clay Qtz: Quartz FeOx: Iron Ca: Calcite NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh SW: Slightly MW: Moderately HW: Highly CW: Completely RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 3: Slightly Rough, Undulating 5: Rough Undulating, Stepped 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-124

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m) 5 10 15	RUN LENGTH (m)	TCR (%) 25 50 75	RQD (%) 25 50 75	SCR (%) 25 50 75	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION (continued from previous page)	DRILLING REMARKS	INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm) 2 4	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
								R1	F		68.50 m to 68.90 m: Broken core, 3 mm thick pyrite vein			6		68.55	J	60	<1	Ca,Sp	6		
														3		68.74	J	20	1	Ca,Cx	6		
69																68.88	J	60	<1	Ca,Sp,Cx	14		
	42	14		1.50	54	67	6				68.90 m to 69.60 m: Core loss												
											69.60 m to 70.00 m: Broken core			6									
70								R2	F		70.00 m to 70.51 m: Core loss												
								R2	F		70.51 m to 71.50 m: PICRITE, jointed with healed microfractures infilled with clay			3		70.71	J	25	1	Ca,Cl	3		
	43	14		1.50	66	26	31									70.72	J	25	1	Ca,Cl	3		
71																70.80	J	25	<1	Sp	3		
														1		70.94	J	50	<1	M	6		
																71.27	J	65	1	Ca	10		
														3		71.31	J	65	1	Ca	6		
								R0	F		71.50 m to 71.95 m: Shear zone, gravel with clay coating			6		71.43	J	50	>3	Cl,Ca	1		
72								R2	F		71.95 m to 72.50 m: PICRITE, with shear zones up to 100 mm thick			6		71.95	S	55	>400	Cl,Cx	1		
	44	14/15		1.50	87	7	10									72.02	J	60	<1	Sp	6		
														6		72.05	J	20	<1	Sp	6		
																72.38	S	55	100	Cl,Cx	1		
								R2	F		72.50 m to 73.00 m: PICRITE, tightly jointed, infilled with calcite and clay			1		72.67	J	40	<1	Sp	3		
														6		72.72	J	85	<1	N	3		
73								R2	F		PICRITE, closely spaced tight joints typically infilled with clay, two joint sets visible, dipping at 55° and 35° to the core axis					72.83	J	45	1	Cl	14		
														6									
														6									
	45	15		1.50	53	0	0							6								PT5 1 x 10-7	
74																							
								R2	F		74.50 m to 76.40 m: Jointed PICRITE												
75														2		75.10	J	40	<1	N	3		
	46	15		1.50	75	20	32							4		75.40	J	30	<1	Ca	6		
																75.45	J	45	<1	Ca	6		
														3		75.50	J	30	<1	Ca	6		
																75.70	J	55	<1	N	6		
76														6									
														6									
																76.33	J	50	<1	Ca	14		
								R0	F		76.40 m to 76.90 m: Shear zone, poor recovery			6									
	47	15/16		1.50	83	26	39																
77								R2	F		76.90 m to 77.80 m: Jointed PICRITE			2		77.10	J	55	<1	N	10		
																77.15	J	60	<1	N	6		
														2		77.40	J	55	<1	N	3	PT4 9 x 10-8	
																77.50	J	55	<1	N	3		
														6		77.55	J	70	<1	N	3		

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None FeOx: Iron Cl: Clay Ca: Calcite Qtz: Quartz NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh HW: Highly SW: Slightly CW: Completely MW: Moderately RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 5: Rough Undulating, Stepped 3: Slightly Rough, Undulating 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-124

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m)	RUN LENGTH (m)	TCR (%)	RQD (%)	SCR (%)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS	INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm)	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
			5 10 15		25 50 75	25 50 75	25 50 75				(continued from previous page)			2 4									
78								R2	F		77.80 m to 78.30 m: Core loss												
	48	16		1.50	69	0	4	R2	F		78.30 m to 79.00 m: Fractured PICRITE with shear zones up to 100 mm thick			6									
79								R2	F		79.00 m to 79.90 m: Core loss			6									
	49	16		1.50	44	0	0																
80								R1	F		79.90 m to 80.50 m: Fractured PICRITE, friable and weak			6		79.97	J	0	<1	N	14		
								R2	F		Broken core, serpentinite infill on fracture surfaces, individual rock fragments appear stronger			6									
81														6									
	50	16/17		1.50	59	0	0							6									
82								R2	F		PICRITE, fine grained, dark grey, weak, fresh			5									
														6		82.37	J	40	-	Ca	9		
																82.40	J	80	1-3	Ca	9		
	51	17		1.50	80	13	37	R2	F		82.65 m to 82.75 m: Zone of broken core			4		82.50	J	80	1-3	Ca	9		
83																82.55	J	20	<1	Ca	5		
								R2	F		83.05 m to 83.15 m: Shear zone			6		82.81	J	70	<1	Ca	2		
								R2	F		83.35 m to 83.50 m: Zone of broken core					82.85	J	20	>3	Ca	2		
								R2	F							82.93	J	80	>3	Go,Ca	8		
																83.04	S/J	80	<1	Go,Ca	8		
																83.15	J	60	<1	Ca	7		
														6		83.20	J	20	<1	Ca	7		
																83.25	J	70	<1	Ca	10		
84														6		83.30	J	70	<1	Ca	10		
																83.37	J	60	<1	Ca	7		
	52	17		1.50	90	0	32							6		83.90	J	40	<1	Ca,Sp	6		
														6									
														6		84.80	J	40	<1	Ca,Sp	6		
85														4									
														3									
	53	17/18		1.50	100	9	51	R2	F		85.55 m to 85.80 m: Broken core			6									
86														4									
														4									
														6									
87								R2	F		86.90 m to 87.30 m: Broken core												
	54	18		1.50	77	51	8																

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None FeOx: Iron Cl: Clay Ca: Calcite Qtz: Quartz NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh HW: Highly SW: Slightly CW: Completely MW: Moderately RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 5: Rough Undulating, Stepped 3: Slightly Rough, Undulating 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-124

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m)	RUN LENGTH (m)	TCR (%)	RQD (%)	SCR (%)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS	INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm)	DISCONTINUITY DATA: FRACTURE ZONE	DISCONTINUITY DATA: DISCONT. DEPTH (m)	DISCONTINUITY DATA: DISCONT. TYPE	DISCONTINUITY DATA: ANGLE To Core Axis (TCA)	DISCONTINUITY DATA: APERTURE (<1,1-3,>3mm)	DISCONTINUITY DATA: INFILL TYPE	DISCONTINUITY DATA: JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
			5 10 15		25 50 75	25 50 75	25 50 75				(continued from previous page)			2 4									
88														6									
														6									
														6									
														6									
	55	18/19		1.50	100	19	19							2									
89														6									
														3									
90	56	19		1.50	57	7	7							5									
														6									
														2									
91														6									
	57	19		1.50	92	25	31							6									
														2									
92														2									
								R2	F		PICRITE, dark greenish grey, serpentinite throughout, fractured Unable to orient core			1									
93	58	19		1.50	57	13	20							6		93.45	J	25	?	N	3		
														3		93.57	J	35	?	N	3		
																93.65	J	30	1	N	6		
94														4		93.70	J	60	<1	N	3		
																93.75	J	65	<1	N	3		
																93.80	J	50	<1	N	3		
																93.89	J	50	<1	N	3		
	59	20		1.50	59	0	5							6								PT6 3 x 10-7	
95														6									
														6									
														6		95.60	J	60	1	N	3		
														6		95.75	J	40	<1	N	3		
96														6									
	60	20		1.50	87	7	15							6									
														6									

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:

DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack

INFILL TYPE: N: None FeOx: Iron Cl: Clay Ca: Calcite Qtz: Quartz NC: Non-Cohesive

ROCK MASS WEATHERING: F: Fresh HW: Highly SW: Slightly CW: Completely MW: Moderately RS: Residual Soil

JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 5: Rough Undulating, Stepped 3: Slightly Rough, Undulating 6: Very Rough, Stepped

HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-124

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m) (5 10 15)	RUN LENGTH (m)	TCR (%) (25 50 75)	RQD (%) (25 50 75)	SCR (%) (25 50 75)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS	INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm) (2 4)	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
											(continued from previous page)												
98	61	20		1.50	59	0	6	R2	F		97.2 m to 97.5 m: Parallel joint set at 40 degree			6 6 6 6 6		97.25 97.35 98.15 98.40 98.80	J J J J J	40 40 25 40 45	<1 <1 <1 <1 2	N N N Ca N	3 3 18 3 3		
99	62	20/21		1.50	53	10	10							6 2									
100								R2	F		100.00 m to 100.36 m: Core loss												
101	63	21		1.50	76	0	17	R3	F		PICRITE, fine grained, greenish grey, fractures typically clean, vuggy zones with calcite crystals and pyrite blebs Unable to orient core			6 6 6 6 6 6		100.48 100.54 100.74 100.84 101.00 101.10 101.19 101.40	J J J J J J J J	55 65 60 40 15 25 65 65	<1 <1 <1 <1 <1 <1 <1 <1	N N N N N N N N	3 3 3 3 3 3 3 3		
102	64	21		1.50	73	27	27	R2-R3 R2-R3 R2-R3	F F F		101.50 m to 101.93 m: PICRITE, fine grained, brownish grey, calcite and quartz veining 101.93 m to 102.00 m: Shear zones 102.00 m to 103.00 m: Core loss			6 6 6 6		101.95 102.15 102.28 102.40	S S J J	15 5 15 50	1 1 1 1	N N Cl Cl	3 3 3 3		
103	65	21/22		1.50	100	28	60	R2-R3 R2-R3 R2-R3	F F F		PICRITE, fine grained, brownish grey, stockwork calcite veining 103.00 m to 103.30 m: Broken core 103.65 m to 104.00 m: Shear zone												
104								R2	F		104.50 m to 104.80 m: Highly fractured zone			3 1		104.00 104.10 104.20 104.35	J J J J	75 45 40 40	1-3 1-3 <1 -	Ca Ca Ca Ca,Sp	6 6 12 -		
105	66	22		1.50	97	0	43							4		104.85 104.87 104.95 105.10	J J J J	45 40 45 85	<1 <1 <1 <1	N N N N	8 8 8 6		
106														3 1		106.10 106.20 106.55	J J J	20 20 20	<1 <1 <1	N N N	6 6 6		

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None FeOx: Iron Cl: Clay Ca: Calcite Qtz: Quartz NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh HW: Highly SW: Slightly CW: Completely MW: Moderately RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 5: Rough Undulating, Stepped 3: Slightly Rough, Undulating 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-124

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m) 5 10 15	RUN LENGTH (m)	TCR (%) 25 50 75	RQD (%) 25 50 75	SCR (%) 25 50 75	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS	INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm) 2 4	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
											(continued from previous page)												
107	67	22/23		1.50	100	0	70	R2	F		107.00 m to 107.15 m: Shear zone			1		106.75	J	20	<1	N	6		
																107.00	S	-		N	-		
								R2	F		107.50 m to 109.00 m: Highly fractured zone, microfracturing, calcite infill along fractures			2		107.25	J	80	<1	Ca	8		
														6		107.60	J	50	<1	N	8		
108																107.85	J	45	1-3	Ca	14		
	68	23		1.50	97	0	80							6		107.90	J	45	1-3	Ca	14		
														6		108.20	J	20	<1	-	10		
														6		108.50	J	40	<1	-	12		
109														6									
																109.05	J	25	<1	Ca	6		
														4		109.15	J	45	<1	Ca	9		
																109.25	J	60	<1	Ca	12		
	69	23		1.50	33	13	27							6		109.28	J	65	<1	Ca	12		
																109.33	J	75	1-3	Ca	12		
110														6									
																110.05	J	20	1-3	Ca	10		
																110.15	J	70	<1	Ca	10		
								R2	F		110.20 m to 110.35 m: Shear zone			6		110.20	J	25	<1	Ca	8		
								R2	F		110.50 m to 111.00 m: Poor recovery			1		110.65	J	45	1-3	Ca	14		
111																110.90	J	80	1	Ca	12		
	70	24		1.50	47	35	42	R3	F		111.00 m to 112.00 m: Highly fractured zone			1									
112								R3	F		PICRITE, greenish grey, clay infill on some fracture surfaces, trace disseminated sulphides Unable to orient core												
														6		112.63	J	55	?	N	6		
	71			1.50	80	33	57							2		112.80	J	45	1-3	Cl	6		
113														2		113.03	J	60	<1	Ca	3		
																113.12	J	20	<1	N	18		
														6		113.30	J	75	<1	N	3		
																113.35	J	50	<1	N	16		
								R3	F					1		113.44	J	55	?	N	14		
114																113.87	J	90	1-3	Ca	18		
														5		113.90	J	65	<1	N	6		
	72			1.50	95	29	69									114.07	J	55	<1	N	6		
														6		114.17	J	55	?	Tr,Cl	6		
														6		114.50	J	45	?	N	6		
																114.57	J	90	1	N	6		
115														5		114.61	J	60	<1	N	6		
								R3	F					2		115.07	J	55	1	N	6		
														2		115.50	J	70	<1	N	3		
	73			1.50	100	71	93							3		115.72	J	60	1	N	6		
116														1		115.75	J	15	<1	N	3		
																115.83	J	65	1	N	3		

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None Cl: Clay Qtz: Quartz FeOx: Iron Ca: Calcite NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh SW: Slightly MW: Moderately HW: Highly CW: Completely RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 3: Slightly Rough, Undulating 5: Rough Undulating, Stepped 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-124

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m)	RUN LENGTH (m)	TCR (%)	RQD (%)	SCR (%)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS	INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm)	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
			5 10 15		25 50 75	25 50 75	25 50 75				(continued from previous page)			2 4									
117	74			1.50	100	69	65	R3	F					1		115.98	J	25	<1	N	14		
														1		116.03	J	75	1-3	Ca	18		
																116.41	J	55	<1	Cl	6		
														1		116.54	J	65	<1	N	14		
																116.82	J	55	>3	Ca	6		
														3									
														2									
118														2									
														4									
	75	26		1.50	100	100	100																
119																							
								R3	F					4									
120	76	26		1.50	100	59	79							1									
														4									
														1									
121														6									
								R3	F					1		121.16	J	60	1	Ca	6		
	77	26/27		1.50	100	100	100							1		121.40	J	70	1-3	N	18		
122																121.95	J	30	<1	N	18		
														2		122.07	J	55	1	N	18		
								R3	F		PICRITE, massive												
123	78	27		1.50	95	88	95							1		123.02	J	60	1	N	10		
														1		123.35	J	50	1	N	18		
														2		123.51	J	35	<1	N	3		
																123.65	J	60	<1	N	3		
124								R3	F														
														1		124.45	J	65	<1	N	6		
	79	27/28		1.50	100	100	100							1		124.68	J	55	<1	N	10		
125														2		125.05	J	70	<1	Ca	10		
																125.13	J	75	<1	N	6		
														1		125.39	J	75	<1	Ca	3		
								R3	F		PICRITE, massive, calcite veins up to 1 mm thick			1									

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None Cl: Clay Qtz: Quartz FeOx: Iron Ca: Calcite NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh SW: Slightly MW: Moderately HW: Highly CW: Completely RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 3: Slightly Rough, Undulating 5: Rough Undulating, Stepped 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-124

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m) (5 10 15)	RUN LENGTH (m)	TCR (%) (25 50 75)	RQD (%) (25 50 75)	SCR (%) (25 50 75)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS	INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm) (2 4)	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
126											(continued from previous page)												
	80	28		1.50	95	88	95							2		125.71	J	65	<1	Ca	6		
																125.88	J	65	<1	Sp	3		
																125.97	J	65	<1	N	10	PT7 3 x 10-9	
														1		126.55	J	50	<1	Sp	3		
127														1		126.82	J	70	<1	Sp	6		
								R3	F		127.00 m to 127.73 m: Fractured zone			6		127.09	J	35	1	Ca,Sp	10		
																127.20	J	50	1	N	3		
														2		127.28	J	85	<1	N	6		
	81	28/29		1.50	100	81	89									127.40	J	85	<1	N	6		
														1		127.60	J	50	<1	Sp	3		
128																127.91	J	25	<1	T,Sp	3		
														1		127.96	J	70	<1	Sp	3		
														1		128.32	J	80	<1	Sp	6		
								R3	F					1		128.70	J	60	1	N	10		
129														1		129.05	J	65	<1	N	10		
	82	29		1.50	100	100	100							1		129.23	J	65	<1	N	3		
														1		129.54	J	60	<1	N	3		
130														1		129.83	J	65	<1	N	18		
								R3	F							130.35	J	45	<1	N	6		
														1		130.61	J	80	<1	N	3		
	83	29/30		1.50	100	100	100							3		130.73	J	70	<1	N	3		
131																130.90	J	60	<1	Sp	3		
								R3	F		Unable to orient core			1		131.75	J	75	<1	Sp	6		
														2		131.92	J	70	<1	Ca	3		
132																132.02	J	80	<1	Sp	10		
	84	30		1.50	100	81	96									132.43	J	10	<1	Sp	3		
														3		132.46	J	80	<1	Sp	3		
																132.53	J	65	130	Cl,Ca	18		
133														1		132.84	J	80	1	N	3		
								R3	F														
	85	30/31		1.50	94	83	96	R3	F		133.60 m to 133.71 m: Shear zone, crushed rock and clay infill					133.62	S	65	1	N	6		
								R3	F		133.73 m to 134.50 m: PICRITE, calcite veins up to 2 mm thick various orientations			1									
134														1		134.10	J	40	3	N	10		
								R3	F		PICRITE, criss-crossing calcite veins, typically less than 1 mm thick												
135																							
	86	31		1.50	98	91	98									135.23	J	20	<1	N	10		

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None Cl: Clay Qtz: Quartz FeOx: Iron Ca: Calcite NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh SW: Slightly MW: Moderately HW: Highly CW: Completely RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 3: Slightly Rough, Undulating 5: Rough Undulating, Stepped 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-124

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m) 5 10 15	RUN LENGTH (m)	TCR (%) 25 50 75	RQD (%) 25 50 75	SCR (%) 25 50 75	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS	INSTRUMENT DETAILS	FRACTURE FREQ. (No. Per 30 cm) 2 4	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
											(continued from previous page)												
136								R2	F					2		135.42	J	80	<1	N	3		
								R2	F					1		135.56	J	45	<1	N	18		
																135.90	J	70	<1	N	10		
	87	31		1.50	77	57	67				136.40 m to 136.80 m: Fractured zone, rock is weaker and more friable			2		136.20	J	65	<1	T	3		
137														6									
														1		137.09	J	80	<1	N	18		
								R2	F		PICRITE, massive, vuggy			1		137.78	J	60	<1	N	10		
138	88	31/32		1.50	100	89	95																
														3		138.42	J	85	<1	N	14		
																138.65	J	45	1	N	10		
																138.70	J	55	1	N	10		
139														1		138.80	S	70	20	Cx,Sp	3		
								R2	F		MAFIC VOLCANICS, fine grained, dark grey, weak, fresh, vuggy, slickensided facture surfaces Unable to orient core			1		139.02	J	85	<1	N	1		
																139.32	J	60	<1	N	1		
														5		139.43	J	60	<1	N	1		
	89	32		1.50	100	69	93									139.50	J	60	<1	N	1		
																139.55	J	60	<1	N	1		
140														2		139.62	J	60	<1	N	1		
																139.68	J	60	<1	Ca,Cl	1		
														2		139.78	J	60	<1	N	1		
																139.92	J	50	<1	Cl	1		
														1		140.06	J	75	<1	N	3		
								R2	F		MAFIC VOLCANICS, fine grained, dark grey, weak, fresh, vuggy, calcite veins and serpentinite infill on fracture surfaces Unable to orient core					140.26	S	55	10	Cx,Cl	14		
141	90	32/33		1.50	100	100	100																
142								R2	F		MAFIC VOLCANICS, fine grained, dark grey, weak, fresh, vuggy, veins up to 6 mm thick mostly 70° to perpendicular, calcite and serpentinite infill on fracture surfaces 142.50 m to 143.00 m: Fractured zone with 5 mm to 20 mm fragments												
								R2	F														
	91	33		1.50	100	93	93							1		142.75	S	N/A	5	Go,Cl,Ca,Sp?	-		
143																							
														2		143.83	J	80	1-3	N	14		
144																144.04	J	80	1-3	N	14		
	92	33/34		1.50	100	80	94									144.25	J	45	<1	N	12		
								R2	F		PICRITE, greenish grey			1									

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None FeOx: Iron Cl: Clay Ca: Calcite Qtz: Quartz NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh HW: Highly SW: Slightly CW: Completely MW: Moderately RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 5: Rough Undulating, Stepped 3: Slightly Rough, Undulating 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-124

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m)	RUN LENGTH (m)	TCR (%)	RQD (%)	SCR (%)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS	INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm)	DISCONTINUITY DATA: FRACTURE ZONE	DISCONTINUITY DATA: DISCONT. DEPTH (m)	DISCONTINUITY DATA: DISCONT. TYPE	DISCONTINUITY DATA: ANGLE To Core Axis (TCA)	DISCONTINUITY DATA: APERTURE (<1,1-3,>3mm)	DISCONTINUITY DATA: INFILL TYPE	DISCONTINUITY DATA: JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
			5 10 15		25 50 75	25 50 75	25 50 75				(continued from previous page)			2 4									
145								R3	F		PICRITE, fine grained, dark greenish grey to light grey, moderately strong, fresh			2		145.15	J	40	<2	N	8		
														2		145.30	J	65	<3	Sp	14		
	93	34		1.50	100	95	100							2		145.35	J	60	<4	Sp	14		
																145.48	J	60	<5	Ca?	10		
146														1		146.12	J	55	<6	Ca	14		
147	94	34/35		1.50	100	93	100	R2-R3	F		147.00 m to 148.00 m: Weaker rock with increased calcite veining												
148								R3	F		PICRITE, fine grained, greenish grey, fresh, calcite veining Unable to orient core			1		147.95	J	60	<7	Sp	12		
	95	35		1.50	100	87	100							1		148.54	J	80	1-3	Ca	14		
149														1		148.92	J	75	<1	Ca	14		
														4		149.20	J	75	<1	Ca?	12		
																149.37	J	30	<1	Ca,Sp	10		
																149.40	J	70	<1	Sp	10		
150	96	35/36		1.50	95	95	95									149.47	J	65	<1	Sp	10		
151														1		151.25	J	75	<1	Sp,Ca	12		
	97	36		1.50	100	100	100							2		151.67	J	80	1-3	Sp	12	PT8 9 x 10-10	
152														2		151.78	J	30	<1	Sp	10		
														1		152.14	J	75	<1	Sp	12		
153														1									
	98	36/37		1.50	97	97	97							1									
										153.4 750.3				1									
								R3	F		153.35 m to 153.80 m: Picrite becomes light grey with small pyrite blebs												
154								R3	F		PICRITE, fine grained, greenish grey, fresh, calcite veining and pyrite blebs present			1									

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None FeOx: Iron Cl: Clay Ca: Calcite Qtz: Quartz NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh HW: Highly SW: Slightly CW: Completely MW: Moderately RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 5: Rough Undulating, Stepped 3: Slightly Rough, Undulating 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R3: Medium Strong (25-30) R6: Extremely Strong (>250) R1: Very Weak (1-5) R4: Strong (50-100) R2: Weak (5-25) R5: Very Strong (100-250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-124

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m) 5 10 15	RUN LENGTH (m)	TCR (%) 25 50 75	RQD (%) 25 50 75	SCR (%) 25 50 75	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS	INSTRUMENT DETAILS
155	99	37		1.50	100	100	100				(continued from previous page)		
156	100	37/38		1.50	96	87	96						
157								R3	F		156.9 746.8 PICRITE/DIORITE, fine grained, fresh, some calcite veins and pyrite blebs Unable to orient core		
158	101	38		1.50	100	100	100						
159	102	38/39		1.50	100	98	100	R3	F		DIORITE, fine grained, dark greenish grey, some calcite veins		
160								R3	F		160.00 m to 160.50 m: Diorite becomes lighter and more fractured Unable to orient core		
161	103	9		1.50	100	67	100						
162	104	39/40		1.50	97	93	97						
163	105	40		1.50	100	98	100						

DISCONTINUITY DATA

FRACTURE FREQ. (No. Per 30 cm) 2 4	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
2		155.60	J	65	<1	N	8		
		155.68	J	75	1-3	Ca,Sp	14		
1		156.25	J	75	<1	N	10		
1		156.50	J	65	<1	N	14		
1		156.74	J	85	<1	N	12		
1		157.12	J	70	<1	Ca	14		
1		157.68	J	25	<1	N	10		
1		158.05	J	70	<1	N	10		
3		158.83	J	55	<1	N	10		
		158.87	J	65	<1	N	12		
		159.04	J	60	<1	N	12		
2		159.70	J	85	<1	N	10		
2		159.90	J	85	<1	N	12		
1		160.12	J	80	<1	N	12		
		160.25	J	60	<1	Sp	10		
		160.63	J	45	<1	Sp,Ca	10		
1		162.03	J	80	<1	N	14		
1		163.20	J	50	1-3	N	14		

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:

DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack

INFILL TYPE: N: None FeOx: Iron Cl: Clay Ca: Calcite Qtz: Quartz NC: Non-Cohesive

ROCK MASS WEATHERING: F: Fresh HW: Highly SW: Slightly CW: Completely MW: Moderately RS: Residual Soil

JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 5: Rough Undulating, Stepped 3: Slightly Rough, Undulating 6: Very Rough, Stepped

HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-124

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m) 5 10 15	RUN LENGTH (m)	TCR (%) 25 50 75	RQD (%) 25 50 75	SCR (%) 25 50 75	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION (continued from previous page)	DRILLING REMARKS	INSTRUMENT DETAILS
165	106	40/41		1.50	97	73	79	R3	F		IMH, fine grained, grey, fresh, quartz veins throughout with abundant sulphide mineralization disseminated along vein boundaries		
166	107	41		1.50	92	73	85	R3	F		DIORITE (SLD), medium grained, dark green to grey, fresh, visible pyrite, epidote and calcite, some fractures show striations oriented at 220°		
167								R3	F		166.9 / 736.8 PICRITE, fine grained, dark green, fresh, medium strong, decreased pyrite content		
168	108	41		1.50	100	91	91						
169											169.4 / 734.3		
170	109	42		1.50	100	100	100	R3	F		MAFIC VOLCANICS, fine to medium grained, green to grey, fresh, medium strong, calcite veins up to 3 mm thick.		
171	110	42		1.50	100	70	84	R3	F		170.80 m to 171.10 m: Highly altered zone		
								R3	F		171.1 / 732.6 DIORITE, medium grained, grey to green, fresh, medium strong, disseminated sulphides and calcite veins up to 5 mm thick		
172													
173	111	42/43		1.50	100	91	93						

DISCONTINUITY DATA

FRACTURE FREQ. (No. Per 30 cm) 2 4	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
2		164.06	J	75	<1	N	14		
1		164.12	J	70	<1	N	14		
		164.20	J	60	<1	N	12		
2		164.70	J	30	<1	Qz	14		
		164.74	J	30	<1	N	6		
1		165.00	J	80	<1	N	14		
2		165.25	J	55	<1	N	6		
		165.30	J	55	<1	N	14		
2		165.56	J	30	<1	FeOx? (red)	14		
1		165.92	J	45	<1	N	14		
1		166.30	J	65	2	Cx	3		
1		166.41	J	65	<1	Ca,Cl	3		
1		166.84	J	60	<1	Ca,Ep,Py	10		
2		167.03	J	40	<1	Ca,Sp	3		
		167.14	J	70	<1	N	10		
2		167.37	J	60	<1	Ca,Sp	3		
		167.43	J	40	<1	Chl	3		
1		168.17	J	50	<1	N	10		
		168.45	J	20	<1	Ca,Sp	3		
3		168.49	J	30	<1	Ca,Sp	3		
		168.66	J	35	<1	Chl,Ca	10		
1		168.71	J	70	<1	N	10		
1		169.20	J	70	<1	Sp,	10		
1		169.43	J	65	<1	Ca,Sp	3		
3		170.86	J	70	<1	N	10		
		170.93	J	80	1	Cl	1		
3		171.03	J	80	3	Ca	14		
		171.26	J	70	<1	N	3		
		171.32	J	5	1	Cal,Qtz	14		
		171.36	J	55	<1	Ca	14		
1		171.95	J	55	5	Cl	3		
2		172.08	J	35	1	Ca	6		
		172.29	J	65	<1	Ca	6		
6		172.34	J	80	1	Ca	6		
		172.39	J	65	<1	Ca	6		
1		172.90	J	75	2	Ca	3		
1		173.33	J	70	<1	Ca	3		

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None FeOx: Iron Cl: Clay Ca: Calcite Qtz: Quartz NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh HW: Highly SW: Slightly CW: Completely MW: Moderately RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 5: Rough Undulating, Stepped 3: Slightly Rough, Undulating 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-124

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m)	RUN LENGTH (m)	TCR (%)	RQD (%)	SCR (%)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS
			5 10 15		25 50 75	25 50 75	25 50 75				(continued from previous page)	
174	112	43		1.50	100	100	100	R3	F		At 173.80 m: Core becomes vuggy and quartz crystals found within the vugs	
175	113	43/44		1.50	100	95	99	R3	F		175.00 m to 176.50 m: Quartz and gypsum found within vugs and pyrite visible along veins Unable to orient core	
176												
177	114	44		1.50	96	91	96					
178	115	44/45		1.50	96	83	83					
179												
180	116	45		1.50	97	97	97					
181												
182	117	45/46		1.50	100	91	100	R3	F		181.7 722.0 MAFIC VOLCANICS, fine to medium grained, green to grey, fresh, medium strong Unable to orient core	
183								R3	F		183.0 720.7 DIORITE, medium grained, grey to green, fresh,	

INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm)	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
	2 4									
	1									
	1		174.41	J	60	<1	Ep,Ca,Py	14		
	1		174.89	J	60	<1	N	6		
	1									
	1		176.18	J	15	2	N	10		
	1		176.49	J	15	1	Qtz	14		
			177.06	J	55	2	Ca	6		
			177.19	J	70	<1	Ca	14		
			177.26	J	45	<1	Ca	6		
	2									
	1									
	2		178.40	J	70	<1	Ca	3		
			178.62	J	50	<1	Ca	3		
	1		179.06	J	20	2	Ca	14		
	2		179.32	J	65	1	N	6		
			179.36	J	65	1	N	6		
			179.99	J	60	<1	N	10		
	1		181.18	J	55	<1	N	10		
			181.28	S	55	10	Cl,Ca	3		
	2		181.34	J	50	<1	N	10		
			181.60	J	70	<1	N	3		
	1									
	1		182.33	J	40	3	Ca,Qtz	18		

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None FeOx: Iron Cl: Clay Ca: Calcite Qtz: Quartz NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh HW: Highly SW: Slightly CW: Completely MW: Moderately RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 5: Rough Undulating, Stepped 3: Slightly Rough, Undulating 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-124

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m)	RUN LENGTH (m)	TCR (%)	RQD (%)	SCR (%)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS
			5 10 15		25 50 75	25 50 75	25 50 75				(continued from previous page)	
	118	46		1.50	94	79	94	R3	F		183.3 / 720.4 medium strong MAFIC VOLCANICS, fine to medium grained, green to grey, fresh, medium strong	
184												
	119	46		1.50	99	99	99					
185											185.5	
								R3	F		718.2 DIORITE, medium grained, grey to green, fresh, medium strong	
186												
	120	47		1.50	99	89	99					
187											187.1	
								R3	F		716.6 MAFIC VOLCANICS, fine to medium grained, green to grey, fresh, medium strong	
	121	47		1.50	100	89	88					
188												
	122	47/48		1.50	100	81	93					
189												
190												
	123	48		1.50	100	91	100					
191											191.5	
								R3 R3	F F		712.2 MAFIC VOLCANICS, medium grained, dark grey, fresh, medium strong 191.50 m to 192.30 m: Altered zone, disseminated sulphides within fractures	
192												
	124	48/49		1.50	94	71	81					

INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm)	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
	2 4									
	1		183.38	J	75	<1	Ca	6		
	1		183.68	J	65	1	Ca	6		
	2		183.88	J	80	2	N	18		
			183.93	J	45	1	Ca	10		
	1		185.13	J	45	<1	N	3		
	1		186.27	J	60	<1	N	3		
	2		186.55	J	70	<1	N	10		
			186.61	J	60	<1	Ca	3		
	1		186.83	J	45	<1	Ca	3		
	1		187.17	J	60	<1	Cl	3		
			187.89	J	65	<1	N	10		
	2		187.98	J	65	<1	Cl	3		
	1		188.28	J	20	2	Ca	10		
			188.56	J	30	1	Cl	1		
	3		188.68	J	30	2	Ca	3		
	6		188.73	J	30	1	N	10		
			189.10	J	80	<1	N	3		
	2		189.32	J	40	<1	N	3		
			189.70	J	50	<1	Ca	3		
	1									
	1		190.27	J	75	<1	Ca	3		
	2		190.37	J	75	<1	N	3		
			190.48	J	55	<1	Ca	3		
	1		190.98	J	70	<1	Cl	1		
	1		191.42	J	45	<1	N	3		
	6		191.78	J	40	2	Qtz, Ca	14		
	2		191.93	J	60	2	Ca,Py	6		
			192.13	J	50	1	Cl	3		
	2		192.67	J	35	<1	N	10		

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None FeOx: Iron Cl: Clay Ca: Calcite Qtz: Quartz NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh HW: Highly SW: Slightly CW: Completely MW: Moderately RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 5: Rough Undulating, Stepped 3: Slightly Rough, Undulating 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-124

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m)	RUN LENGTH (m)	TCR (%)	RQD (%)	SCR (%)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS	INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm)	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
			5 10 15		25 50 75	25 50 75	25 50 75				(continued from previous page)			2 4									
193																192.73	J	60	<1	N	10		
																192.90	J	85	<1	N	3		
								R3	F		Unable to orient core					193.22	J	65	<1	Ca	3		
																193.27	J	55	<1	Ca	3		
	125	49		1.50	100	100	100							2		193.68	J	45	<1	N	6		
194														1		194.14	J	75	<1	Ca	6		
											194.5			1										
								R3	F		709.2 MAFIC VOLCANICS as above, sulphides around veins. Unable to orient core.			6		194.71	J	80	<1	N	3		
																194.77	J	60	<1	N	3		
195																194.81	J	60	<1	Ca	3		
														2		195.51	J	80	<1	N	6		
																195.63	J	65	<1	N	6		
196														1									
	127	50		1.50	100	88	100	R3	F		196.6 : Shear zone, 10 mm width					196.60	S	60	<3				
197														1		197.05	J	45	1-3	N	6		
											197.5													
								R3	F		706.2 MAFIC VOLCANICS, fine grained, fresh, massive, trace calcite veins with max 5 mm width Unable to orient core			1		197.60	J	60	<1	N	14		
198																							
	128	50/51		1.50	97	93	97							1		198.26	J	80	<1	Sp, Ca	6		
																198.65	J	60	<1	Sp, Ca	6		
														2		198.82	J	65	<1	Sp, Ca	6		
199																199.35	J	60	<1	Sp	6		
														3		199.40	J	60	<1	Sp	6		
	129	51		1.50	100	91	100									199.47	J	65	<1	Sp	6		
200														2		200.05	J	55	<1	Sp	6		
																200.10	J	60	<1	Sp	6		
														1		200.22	J	60	<1	Sp	6		
201																							
	130	51/52		1.50	95	53	81							2		201.30	J	55	<1	Ca	3		
																201.35	J	55	<1	Sp	3		
														2		201.48	J	60	<1	Ca	6		
																201.63	J	80	2	Ca	10		
														1		201.74	J	70	1	N	3		
202																201.79	J	70	1	N	3		
														2		202.06	J	50	<1	N	3		
																202.08	J	50	<1	Ca	3		

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:

DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack

INFILL TYPE: N: None Cl: Clay Qtz: Quartz FeOx: Iron Ca: Calcite NC: Non-Cohesive

ROCK MASS WEATHERING: F: Fresh SW: Slightly MW: Moderately HW: Highly CW: Completely RS: Residual Soil

JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 3: Slightly Rough, Undulating 5: Rough Undulating, Stepped 6: Very Rough, Stepped

HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-124

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m) (5 10 15)	RUN LENGTH (m)	TCR (%) (25 50 75)	RQD (%) (25 50 75)	SCR (%) (25 50 75)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS	INSTRUMENT DETAILS
											(continued from previous page)		
203	131	52		1.50	99	77	99						
								R3	F		203.5 m: Disseminated sulphides		
204	132	52/53		1.50	100	70	95						
205								R3	F		205.15 m: Unable to orient core		
	133	53		1.50	98	79	98						
206													
								R3	F		206.7 m to 207.7 m: disseminated sulphides and K-feldspar veins with max 2 mm width		
207	134	53/54		1.50	100	76	91						
								R3	F		207.7 m to 208.0 m: fracture zone		
208													
	135	54		1.50	93	79	89						
209								R3	F		209.0 / 694.7 PICRITE, calcite veins, red to purple stain on joint surfaces 209.15 m to 209.18 m Shear zone		
								R3	F		209.9 / 693.8 Shear zone,		
210	136	54		1.50	30	23	23	R3	F		209.85 m to 211 m: Core loss		
211								R3	F		211.0 / 692.7 MAFIC VOLCANICS, fresh, trace calcite veins Unable to orient core		
	137	54/55		1.50	97	97	97						

DISCONTINUITY DATA

FRACTURE FREQ. (No. Per 30 cm) (2 4)	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
2		202.25	J	70	<1	N	3		
2		202.42	J	60	<1	Ca	3		
2		202.64	J	40	<1	Ca	3		
2		202.82	J	65	1	Gy	3		
2		202.88	J	30	1	Sp	3		
2		203.05	J	70	<1	Sp	3		
2		203.18	J	75	<1	Sp	3		
2		203.26	J	55	<1	Sp	3		
1		203.44	J	70	<1	N	10		
1		203.72	J	70	<1	Sp	3		
2		203.81	J	60	<1	N	3		
2		204.01	J	60	<1	Sp	3		
4		204.14	J	50	1	Cl	3		
4		204.22	J	50	1	Cl	3		
2		204.27	J	80	1	N	3		
2		204.30	J	60	<1	N	3		
1		204.47	J	75	<1	Gy	3		
1		204.67	J	80	<1	Gy	3		
1		205.15	J	75	<1	N	3		
4		205.43	J	75	<1	N	10		
1		205.47	J	70	1	Cl	3		
1		205.58	J	60	1	N	3		
1		205.65	J	60	<1	N	10		
1		205.83	J	80	<1	N	3		
1		206.03	J	45	<1	Sp	3		
1		206.42	J	70	<1	N	3		
1		206.56	J	80	<1	Sp	3		
1		207.05	J	45	<1	Cl	6		
1		207.22	J	45	<1	Sp	10		
2		207.42	J	80	<1	Sp	10		
6		207.54	J	40	<1	Sp	14		
1		208.25	J	65	1-3		14		
1		209.15	S	45			18		
2		209.35	J	80	1-3				
1		209.40	J	80	1-3				
		209.80	J	40	1-3	Cl,Ca	18		
		210.70	J	55	<1	Sp	14		
1									

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None Cl: Clay Qtz: Quartz FeOx: Iron Ca: Calcite NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh SW: Slightly MW: Moderately HW: Highly CW: Completely RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 3: Slightly Rough, Undulating 5: Rough Undulating, Stepped 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-124

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m)	RUN LENGTH (m)	TCR (%)	RQD (%)	SCR (%)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS	INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm)	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
			5 10 15		25 50 75	25 50 75	25 50 75				(continued from previous page)			2 4									
212																							
213	138	55		1.50	100	97	100							1									
														2		213.20	J	40	<1	N	10		
																213.24	J	65	<1	N	18		
														1		213.40	J	50	<1	N	14		
																213.80	J	75	1-3	Ca	14		
214								R3	F		214.0 689.7 PICRITE, greenish grey Unable to orient core					214.00	J	40		An	10		
														1		214.30	J	60	1-3	N	18		
											214.5					214.40	J	55	<1	N	18		
								R3	F		689.2 DIORITE			6		214.50	J	10	<1	Ca	6		
	139	55/56		1.50	88	35	53	R3	F		214.8 688.9 Unable to orient core			6									
								R3	F							214.90	J	50		N	6		
215											PICRITE, greenish grey, qaurtz and calcite veins, sulphide mineralization along veins 214.75 m to 217.53 m: Shear zone with numerous thin fractures and some sandy/clayey infill.			1		215.20	J	40		Ca	18		
														1		215.74	J	60	<1	N	6		
216														3		215.95	J	65	<1	N	6		
	140	56		1.50	80	33	38	R3	F		216.26 m: Shear zone, fractured with clayey gouge and crushed rock infill			6		216.17	J	65	<1	Ca	18		
														6									
217														6		217.20	J	40	1-3	N	10		
														6		217.42	J	60	<1	N	18		
	141	56		1.50	100	59	75				217.8												
								R3	F		685.9 DIORITE, light green grey, chlorite alteration, intact Unable to orient core			1									
218								R3	F		218.2 m: Sheer zone, clayey and sandy infill			6		218.20	J	60	<3	N	6		
																218.25	S	45		Cl			
								R3/R4	F		PICRITE, light greenish grey to black, fine grained, localized frature zones, calcite and quartz veins throughout Unable to orient core			6		218.85	J	35		N	3		
219	142	56/57		1.50	100	67	67							2									
														1		219.18	J	60	>3	Sand	10		
														1		219.40	J	45	<1	N	10		
														1									
220								R3	F		220.0 m to 220.25 m: white alteration (quartz?)			2									
	143	57		1.50	100	68	100	R2	F		220.6 m to 221.11 m: Healed shear zone, fractured rock with clayey gouge Rock becomes weaker (R2)			1		220.63	S	50	480	Cl,Ca	1		
221														1		221.11	S	40	480	Cl,Ca	1		
														1		221.25	S	80	<1	N	10		

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None FeOx: Iron Cl: Clay Ca: Calcite Qtz: Quartz NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh HW: Highly SW: Slightly CW: Completely MW: Moderately RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 5: Rough Undulating, Stepped 3: Slightly Rough, Undulating 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-124

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m)	RUN LENGTH (m)	TCR (%)	RQD (%)	SCR (%)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS	INSTRUMENT DETAILS
			5 10 15		25 50 75	25 50 75	25 50 75				(continued from previous page)		
222								R2	F		PICRITE, as above, unaltered, pitted		
	144	57/58		1.50	96	69	67	R2	F		222.2 m to 222.5: m Fracture zone, tight aperture Unable to orient core		
								R2	F		222.55 m to 222.74 m: Shear zone, crushed rock with clayey gouge		
223								R2	F		222.92 m: Pale green and purple alteration		
								R3	F		223.3 680.4 DIORITE, greenish grey, medium grained, fresh, strong, sulphides along veins Unable to orient core		
	145	58		1.50	100	24	100						
224													
	146	58/59		1.50	95	69	66						
225													
	147	59		1.50	99	69	85						
226													
	148	59/60		1.50	100	99	94						
227													
	149	60		1.50	99	74	74	R3	F		229.2 m to 229.5 m: rubble zone		
228													
	151	61		1.50	100	69	72	R3	F		DIORITE, dark grey to greenish white, mediem grained, chlorite alteration, quartz and calcite veining, joint surfaces with pink (potassic ?) alteration,		
229													
230													
231													

DISCONTINUITY DATA

FRACTURE FREQ. (No. Per 30 cm)	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
2 4									
6		222.30	S	80	30	Cl,Ca	1		
2		222.52	S	65	<1	Cl	1		
		222.69	J	35	90	Cl,Ca	1		
2		223.10	J	60	1	Cl	3		
		223.18	J	60	1	N	10		
		223.58	J	70	1	Ca	3		
2		223.64	J	55	1	N	10		
6		224.60	J	55		N	3		
		224.75	J	5	<1	N	3		
		224.76	J	65	1	Ca	14		
2		224.95	J	75	<1	An	6		
1		225.09	J	75	<1	N	3		
2		225.50	J	65	1	Ca	6		
		225.70	J	70	<1	N	6		
6									
6		226.10	J	70	<1	N	6		
		226.19	J	70	<1	N	3		
		226.25	J	55		N	6		
2		226.30	J	70		Ca, Gy	3		
1		226.84	J	65	<1	An	6		
1		227.03	J	40	<1	N	3		
6		227.38	J	75		N	14		
2		227.90	J	60	<1	N	10		
		227.95	J	25	<1	N	6		
		228.10	J	65	<1	N	14		
3		228.23	J	60	<1	Ca,An	6		
1		228.25	J	80	<1	An	6		
		228.51	J	90	<1	Ca	6		
2		228.67	J	70	<1	Ca	14		
6									
6									
1		229.65	J	80	<1	Ca,An	6		
2		230.05	J	45	<1	N	6		
		230.20	J	35	<1	N	18		
1		230.38	J	25		Ca,An	6		
		230.50	J	25	1	N	6		
2		230.58	J	65		FeOx	6		
		230.83	J	70	1-3	FeOx	14		
3		230.89	J	80	1-3	FeOx	6		

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None FeOx: Iron Cl: Clay Ca: Calcite Qtz: Quartz NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh HW: Highly SW: Slightly CW: Completely MW: Moderately RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 5: Rough Undulating, Stepped 3: Slightly Rough, Undulating 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-124

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m) (5 10 15)	RUN LENGTH (m)	TCR (%) (25 50 75)	RQD (%) (25 50 75)	SCR (%) (25 50 75)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS	INSTRUMENT DETAILS
											(continued from previous page)		
	150	60		1.50	100	57	79				epidote throughout, disseminate sulphides throughout, calcite, quartz and iron oxide on some joint surfaes Unable to orient core		
232								R3	F		232.0 m to 232.1 m: Rubble zone		
233													
234	152	61		1.50	100	73	83						
235													
236	153	62		1.50	98	93	98						
237	154	62		1.50	100	83	89						
238													
239	155	62/63		1.50	100	67	88	R3	F		238.5 m to 238.65 m: Rubble zone with two high angle discontinuity planes		
240	156	63		1.50	100	100	100						

DISCONTINUITY DATA

FRACTURE FREQ. (No. Per 30 cm) (2 4)	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)
		231.05	J	5	<1	N	18
2		231.15	J	80	1	Gy,FeOx	6
		231.40	J	80	<1	Gy, FeOx	6
2						Gy,FeOx	
		231.68	J	75	<1	Gy, FeOx	3
		231.75	J	45	<1	Gy,FeOx	6
3		231.90	J	60	1	Gy, FeOx	18
		232.10	J	90	1-3	N	14
6		232.30	J	0	<1	Gy	14
		232.47	J	85	1	N	6
1						Gy	
		232.82	J	65	<1	Gy,FeOx Gy, FeOx	14
1						Gy	
1		233.25	J	75	<1	N	6
		233.60	J	70	<1	Gy,FeOx	6
2				20		Gy, FeOx	
2		234.05	J	65	<1	Ca, FeOx	3
		234.10	J	70	1	Ca, FeOx	6
1		234.29	J	70	1	Ca	3
		234.54	J	70	1	N	10
4		234.58	J	70	1	Ca, FeOx	8
		234.74	J	85	<1	Ca, FeOx	6
2		235.00	J	85	1	Ca, FeOx	6
		235.03	J	60	1	Ca, FeOx	6
1		235.15	J			Ca, FeOx	6
		235.64	J	70	<1	Ca	6
3		235.81	J	85	1	Ca	18
		235.89	J	85	1	Ca	18
1							
		236.48	J	80	1-3	Ca	6
2		236.55	J	70	<1	N	18
		236.60	J	70	1	N	18
2							
		237.02	J	65	<1	Ca	6
		237.05	J	65	<1	Ca	6
4		237.28	J	40	<1	Ca	6
		237.33	J	65	<1	N	6
1		237.45	J	75	<1	Ca, FeOx	14
		237.70	J	30	<1	Ca, FeOx	6
1		237.85	J	65		Ca, FeOx	14
				85		Cl	
6							
		238.64	J	25		N	6
2		238.74	J	35	1	N	6
		238.82	J	55	<1	Ca	6
1		238.95	J	25	<1	N	6
		239.25	J	55	<1	N	3
2		239.34	J	50		N	6
1		239.65	J	40	<1	N	14
		239.87	J	85	<1	Ca, Gy	6
1							

PERMEABILITY (m/sec)

SAMPLE RETAINED

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:

DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack

INFILL TYPE: N: None FeOx: Iron Cl: Clay Ca: Calcite Qtz: Quartz NC: Non-Cohesive

ROCK MASS WEATHERING: F: Fresh HW: Highly SW: Slightly CW: Completely MW: Moderately RS: Residual Soil

JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 5: Rough Undulating, Stepped 3: Slightly Rough, Undulating 6: Very Rough, Stepped

HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-124

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m)	RUN LENGTH (m)	TCR (%)	RQD (%)	SCR (%)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS	INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm)	DISCONTINUITY DATA: FRACTURE ZONE	DISCONTINUITY DATA: DISCONT. DEPTH (m)	DISCONTINUITY DATA: DISCONT. TYPE	DISCONTINUITY DATA: ANGLE To Core Axis (TCA)	DISCONTINUITY DATA: APERTURE (<1,1-3,>3mm)	DISCONTINUITY DATA: INFILL TYPE	DISCONTINUITY DATA: JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
			5 10 15		25 50 75	25 50 75	25 50 75				(continued from previous page)			2 4									
241								R3	F		241.0 240.8 m: Fragments of angular mafic volcanics			2		240.80	J/S	65	>3	Ca, Gy	6		
								R3	F		662.7 BRECCIA, fine grained, dark grey volcanics and medium grained grey diorite, calcite and quartz veining , chlorite alteration, epidote throughout, disseminated sulphides throughout			1		240.98	J	90	<1	N	6		
																241.28	J	80	<1	N			
	157	63/64		1.50	100	99	100									241.57	J	50	<1	N	14		
242								R3	F		241.8 Fracture zone, 30 mm width, calcite and gypsum (?) infill			2		241.63	J	50	<1	N	6		
														1		242.11	J	80	<1	N	6		
243																242.87	J	75	<1	Ca	14		
	158	64		1.50	100	100	100							1		243.21	J	75	1	Gy	6		
														1		243.58	J	90	1	Gy	6		
											244.0			1		243.88	J	55	1	Ca	6		
244								R3	F		659.7 MAFIC VOLCANICS, dark grey to green groundmass, fine grained, highly altered (chlorite and k-fledspar), some zones of porphyritic texture, calcite/quartz veining throughout, disseminated sulphides throughout. Unable to orient core												
	159	64/65		1.50	100	100	100							1		244.48	J	70	<1	N	6		
245																							
														1		245.31	J	60	<1	Gy (tr.)	6		
								R3	F		245.5 m: Unable to orient core												
246														1									
	160	65		1.50	96	94	96							1		246.15	J	60	1-3	N	14		
														2		246.46	J	45	<1	Gy (tr.)	14		
247																246.48	J	45	<1	Gy (tr.)	6		
														3		247.16	J	45	<1	N	6		
																247.26	J	50	<1	N	6		
	161	65/66		1.50	100	90	100									247.29	J	55	<1	Gy	6		
248																247.90	J	65	<1	Gy (tr.)	6		
														1		248.14	J	55	<1	Gy	6		
														3		248.28	J	75	1	Gy	14		
																248.41	J	75	1-3	Gy	14		
																248.50	J	55	<1	N	6		
249																							
	162	66		1.50	100	100	100																
								R3	F		249.4 654.3 DIORITE, grey to green, medium grained, qairtz/calcite veining												
250											250.0 653.7 End of Hole at: 250.0 m												

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None FeOx: Iron Cl: Clay Ca: Calcite Qtz: Quartz NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh HW: Highly SW: Slightly CW: Completely MW: Moderately RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 5: Rough Undulating, Stepped 3: Slightly Rough, Undulating 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-124

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m) 5 10 15	RUN LENGTH (m)	TCR (%) 25 50 75	RQD (%) 25 50 75	SCR (%) 25 50 75	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS	INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm) 2 4	DISCONTINUITY DATA: FRACTURE ZONE	DISCONTINUITY DATA: DISCONT. DEPTH (m)	DISCONTINUITY DATA: DISCONT. TYPE	DISCONTINUITY DATA: ANGLE To Core Axis (TCA)	DISCONTINUITY DATA: APERTURE (<1,1-3,>3mm)	DISCONTINUITY DATA: INFILL TYPE	DISCONTINUITY DATA: JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
251											(continued from previous page) Shallow Vibrating Wire Piezometer installed at 50.4 m; Deep Vibrating Wire Piezometer installed at 190.4 m.													
252																							
253																							
254																							
255																							
256																							
257																							
258																							
259																							

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:

DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack

INFILL TYPE: N: None Cl: Clay Qtz: Quartz FeOx: Iron Ca: Calcite NC: Non-Cohesive

ROCK MASS WEATHERING: F: Fresh SW: Slightly MW: Moderately HW: Highly CW: Completely RS: Residual Soil

JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 3: Slightly Rough, Undulating 5: Rough Undulating, Stepped 6: Very Rough, Stepped

HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-128

Klohn Crippen Berger

DATE STARTED: April 18, 2014	LOCATION: Kamloops, BC	BIT SIZE AND TYPE: HQ3 Impregnated Bit	SHEET 3 OF 23
DATE FINISHED: April 30, 2014	LOGGED BY: LB/JC/BY	RIG MAKE AND MODEL: Fraste Multidrill XL	GROUND ELEVATION (m): 904.3
CLIENT: KGHM International	CHECKED BY: MAB	TOTAL DEPTH (m): 198.8	COORDINATES (m): N 5609497 E 683325
PROJECT NAME: Ajax Mine Groundwater Study	DRILLING CO.: Geotech Drilling Services Ltd.	BEDROCK DEPTH (m): 17.8	COORDINATE SOURCE: KGHM
PROJECT NO.: M09871A01	DRILLER: JL	AZIMUTH/ANGLE FROM VERT.: -90	

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m)	RUN LENGTH (m)	TCR (%)	RQD (%)	SCR (%)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS	INSTRUMENT DETAILS
			5 10 15		25 50 75	25 50 75	25 50 75						
18								R3	F		PICRITE, grey, fine grained, fresh, stained joint surfaces		
	13	1		1.00	71	0	34	R3	F		18.3 m to 18.4 m: Broken zone		
								R3	F		18.5 m to 18.55 m: Broken zone		
								R3	F		18.7 m to 18.8 m: Broken zone		
19								R3	F		18.8 m to 20.3 m: Broken zone, dark grey		
	14	1		1.50	37	0	0						
20													
								R3	F		20.3 m to 20.7 m: Fractured zone, gravel sized rock fragments		
								R3	F		20.7 m to 23.3 m: trace pyrite on joint surfaces		
21	15	1		1.50	84	8	20						
22													
	16	1/2		1.50	83	0	13						
23													
24	17	2		1.50	93	9	27	R3	F		24.2 m to 24.6 m: Broken core		
25								R3	F		24.8 m to 26.3 m: 4 joint sets, tight aperture (less than 1 mm)		
	18	2/3		1.50	100	17	45						

DISCONTINUITY DATA											
FRACTURE FREQ. (No. Per 30 cm)	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
---	---	---	---	---	---	---	---	---	---
2 4									
6		18.25	J	85	<1	Ca,Sp	3		
6		18.45	J	40	<1	Ca,Sp	10		
6		18.68	J	45	<1	Sp?	6		
6									
6									
6		20.87	J	0	<1	Ca,Sp	18		
6		21.11	J	40	<1	Ca,Sp	6		
5		21.26	J	25	<1	Ca,Sp	6		
		21.30	J	65	<1	Ca,Sp	10		
3		21.35	J	40	<1	Ca, Sp, Py	6		
		21.42	J	50	1	Ca, Sp, Py	6		
6		21.46	J	55	1	Ca, Sp, Py	10		
		21.53	J	0	1	Ca,Sp	10		
6		21.61	J	55	<1	Ca,Sp	10		
		21.72	J	20	<1	Ca,Sp	3		
6		22.04	J	65	<1	Ca,Sp	10		
		22.20	J	25	<1	N	3		
6		22.22	J	40	<1	N	6		
		22.38	J	30	<1	Sp	3		
6		23.48	J	70	<1	Sp	3		
		23.52	J	75	<1	Ca	3		
4		23.55	J	60	<1	Ca	14		
		23.60	J	60	<1	Ca,Sp	3		
6		23.72	J	55	<1	Ca,Sp	3		
		23.80	J	60	<1	Ca	10		
6		23.87	J	60	<1	Ca	10		
		23.94	J	40	<1	Ca	3		
6		24.04	J	40	<1	Ca,Sp	3		
		24.05	J	0	<1	Ca,Sp	3		
6		24.14	J	65	<1	Ca	6		
		24.88	J	40	<1	Ca	6		
5		24.93	J	55	<1	Ca	6		
		25.05	J	50	<1	N	6		
		25.10	J	50	<1	Ca, Sp, Py	3		
4		25.14	J	40	<1	N	10		
		25.18	J	40	<1	N	10		

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None FeOx: Iron Cl: Clay Ca: Calcite Qtz: Quartz NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh HW: Highly SW: Slightly CW: Completely MW: Moderately RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 5: Rough Undulating, Stepped 3: Slightly Rough, Undulating 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-128

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m) (5 10 15)	RUN LENGTH (m)	TCR (%) (25 50 75)	RQD (%) (25 50 75)	SCR (%) (25 50 75)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS	INSTRUMENT DETAILS
26								R3	F		(continued from previous page)		
								R3	F		1 joint set, 20 mm spacing, 50 degrees, tight aperture (less than 1 mm) 26.3 m to 27.8 m: joint set at 45 degrees, spacing 0.15 - 0.25 m, tight aperture, calcite infill		
27	19	3		1.50	100	55	88						
28								R3	F		27.8 m to 29.3 m: greenish grey, joints approximately 45 degrees (tight aperture, some calcite veining), trace pyrite mineralization on joint surfaces 25.9 m to 26.0 m: joint set (4 joints), spacing 20 mm, 50 degrees, tight aperture (less than 1 mm)		
	20	3		1.50	100	93	97	R3	F				
29											29.3 m to 30.8 m: Tight joint aperture, mechanical breaks.		
30	21	4		1.50	100	59	70						
31													
	22	4		1.50	97	90	90						
32								R3	F		32.3 m to 33.8 m: very competent, veining throughout, tight aperture, weathering on joint surfaces, sulphide mineralization throughout (pyrite)		
33	23	5		1.50	100	85	89						
34								R3	F		33.8 to 35.3 m: dark greenish grey, quartz calcite veins throughout, sulphides along vein margins and throughout, fractured		
	24	5		1.50	100	10	28	R3	F		34.6 m to 34.8 m: Shear zone, sand sized particles, fractured		
35													

DISCONTINUITY DATA

FRACTURE FREQ. (No. Per 30 cm) (2 4)	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
6		25.21	J	40	<1	N	10		
		25.23	J	50	<1	N	10		
6		25.30	J	35	<1	Ca	6		
		25.31	J	55	<1	Ca	3		
3		25.48	J	50	<1	Ca	3		
		25.60	J	35	<1	Ca	14		
4		25.64	J	25	<1	Ca	14		
		25.65	J	60	<1	Ca	10		
3		25.80	J	60	10	Ca	6		
		25.90	J	20	<1	Ca	10		
3		26.00	J	50	<1	Ca	6		
		26.10	J	50	<1	Ca	6		
2		26.19	J	50	<1	Ca	10		
		26.24	J	20	1-3	Ca	14		
		26.30	J	50	<1	Ca	6		
2		26.42	J	45	1-3	Ca	6		
		26.43	J	40	<1	Ca	10		
1		26.60	J	85	1-3	Ca	10		
		26.70	J	80	<1	Ca	6		
		26.80	J	45	<1	Ca	6		
		26.90	J	60	<1	Ca	6		
2		27.00	J	60	<1	Ca	6		
		27.10	J	45	<1	Ca	6		
1		27.32	J	45	<1	Ca	6		
		27.45	J	45	<1	Ca	6		
6		27.60	J	45	<1	Ca	6		
		27.70	J	45	<1	Ca	6		
		27.75	J	40	<1	Ca	6		
2		27.85	J	55	?	N	3		
		28.10	J	55	1	Ca	3		
4		28.15	J	30	<1	Ca	6		
		28.85	J	30	<1	N	3		
1		28.90	J	50	<1	N	6		
		29.15	J	25	<1	N	6		
4		29.63	J	60	1	Ca	6		
		29.76	J	30	<1	N	6		
1		29.93	J	50	<1	N	18		
1		30.02	J	60	<1	N	3		
		30.40	J	70	1	N	6		
1		30.56	J	65	<1	N	18		
		30.98	J	65	<1	N	3		
2		31.14	J	45	<1	N	18		
		31.50	J	45	<1	N	6		
1		31.88	J	30	<1	N	6		
		32.05	J	55	<1	N	3		
1		32.38	J	60	<1	N	6		
1		32.80	J	45	<1	N	6		
1		33.10	J	55	<1	N	3		
1		33.50	J	15	?	N	6		
6		34.18	J	55	1	N	1		
6		34.25	J	55	1	N	10		
6									
6		34.97	J	45	?	N	3		
6									

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None FeOx: Iron Cl: Clay Ca: Calcite Qtz: Quartz NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh HW: Highly SW: Slightly CW: Completely MW: Moderately RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 5: Rough Undulating, Stepped 3: Slightly Rough, Undulating 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-128

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m) (5 10 15)	RUN LENGTH (m)	TCR (%) (25 50 75)	RQD (%) (25 50 75)	SCR (%) (25 50 75)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS	INSTRUMENT DETAILS
											(continued from previous page)		
36	25	6		1.50	100	69	83	R3	F		35.3 m to 36.8 m: Dark greensh grey, quartz veining, other veins filled with soft white mineral (non reactive to HCl)		
37	26	6		1.50	100	31	67	R3 R3 R3 R3	F F F F		36.7 m to 36.8 m: Fractured rock 36.8 m to 38.3 m: dark greenish grey, jointed 36.9 m to 37.5 m: Joint spacing 0.08 to 0.15 m		
38													
39	27	6/7		1.50	100	59	92	R3 R3 R3 R3	F F F F		greenish grey 39.05 m to 39.60 m: Poor rock quality, closed joint and open veins (less than 1 mm). 39.43 m to 39.50 m: Shear zone 39.60 m to 41.25 m: Broken zone		
40	28	7		1.50	80	27	53						
41													
42	29	7/8		1.50	87	33	43	R3 R3	F F		41.4 m to 41.8 m: Fractured, coarse gravel size 42.6 m to 42.8 m: Poor rock quality, 1 mm wide veins along drill axis (infill?)		
43	30	8		1.50	87	45	62	R3	F				
44								R3	F		44.3 860.0 MAFIC VOLCANICS, Fresh, dark greenish grey		

DISCONTINUITY DATA

FRACTURE FREQ. (No. Per 30 cm) (2 4)	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
3		35.39	J	70	1-3	N	6		
		35.57	J	75	<1	N	6		
2		35.87	J	80	<1	N	3		
4		35.96	J	75	<1	N	3		
		36.25	J	60	<1	N	3		
6		36.60	J	70	<1	N	3		
4		36.90	J	65	<1	N	6		
		36.97	J	65	<1	N	10		
2		37.05	J	65	<1	N	10		
		37.10	J	65	<1	N	4		
3		37.21	J	65	<1	N	8		
		37.37	J	65	<1	N	8		
4		37.50	J	65	<1	N	10		
		37.63	J	35	?	N	8		
4		37.72	J	55	<1	Ca	10		
		37.85	J	55	<1	Ca	10		
2		37.96	J	55	<1	Ca	10		
		38.07	J	55	<1	Ca	8		
		38.18	J	75	<1	Ca	8		
		38.32	J	45	<1	N	8		
		38.37	J	65	<1	N	8		
3		39.02	J	45	<1	N	6		
		39.07	J	80	-	N	12		
2		39.19	J	80	1-3	Cl	12		
		39.47	J	25	>3	Cl, Sp	16		
2		39.70	J	75	<1	N	10		
		39.76	J	75	<1	N	10		
1		39.85	J	45	<1	N	6		
		39.98	J	70	<1	N	14		
3		40.20	J	60	<1	N	8		
		40.32	J	60	<1	N	8		
		40.40	J	75	?	Cl, Sp	12		
1		41.15	J	75	1-3	Ca?	16		
1		42.00	J	35	<1	Ca, Sp	14		
		42.25	J	40	<1	N	8		
2		42.28	J	35	<1	N	8		
		42.30	J	35	<1	N	8		
		42.85	J	65	<1	N	10		
2		42.90	J	65	<1	N	10		
		43.10	J	70	<1	N	10		
2		43.15	J	65	<1	N	12		
1		43.95	J	65	<1	N	10		
3		44.20	J	65	<1	N	12		
		44.23	J	55	<1	N	10		
1		44.30	J	65	<1	N	12		
		44.40	J	45	<1	N	8		
1		44.65	J	45	?	N	10		

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None Cl: Clay Qtz: Quartz FeOx: Iron Ca: Calcite NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh SW: Slightly MW: Moderately HW: Highly CW: Completely RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 3: Slightly Rough, Undulating 5: Rough Undulating, Stepped 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-128

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m)	RUN LENGTH (m)	TCR (%)	RQD (%)	SCR (%)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS	INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm)	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
			5 10 15		25 50 75	25 50 75	25 50 75				(continued from previous page)			2 4									
	31	8		1.50	97	87	83	R3	F		45.5 m to 45.8 m: Poor quality with veins, veins are up to 2 mm wide, calcite or quartz infill 45.8 m to 47.3 m: Massive, medium strength, with pyrite on fractured surfaces			3		44.83	J	45	<1	N	10		
								R3	F					3		44.96	J	35	<1	Ca?	12		
																44.98	J	45	<1	N	12		
																45.06	J	25	<1	N	8		
														6		45.15	J	50	<1	N	6		
																45.26	J	60	<1	N	14		
46																45.33	J	65	<1	N	14		
	32	9		1.50	99	91	99									45.40	J	55	<1	N	12		
																45.45	J	55	<1	N	12		
														1		45.52	J	65	<1	Ca	14		
																45.60	J	70	<1	Ca	14		
														1		45.63	J	65	<1	Ca	14		
																46.28	J	50	<1	Sp	3		
47														2		46.43	J	60	<1	Sp	3		
																46.72	J	55	<1	Sp	3		
														1		46.88	J	50	<1	Sp, Py	6		
																47.21	J	50	<1	N	3		
																47.58	J	35	<1	N	14		
														2		47.82	J	40	<1	Sp, Py	3		
48	33	9		1.50	100	100	100							1		48.08	J	60	<1	N	6		
																48.47	J	45	<1	Py	6		
														1									
49																							
														1		49.20	J	55	<1	Sp, Py	3		
	34	10		1.50	99	76	85							1		49.65	J	45	<1	Sp	14		
														1									
50																50.03	J	20	<1	Sp, Py	14		
								R3	F		50.3 m to 51.8 m: Sub-vertical fractures with fibrous white infill (very rough), up to 3 mm aperture					50.50	J	40	<1	Sp, Py	3		
														2		50.55	J	15	3		14		
51	35	10		1.50	94	88	94																
														1		51.37	J	50	<1	Sp, Py	3		
														1		51.71	J	20	<1	Sp, Py	3		
52								R3	F		51.8 m to 53.3 m: Quartz/calcite veins throughout, fractures approximately 60 degrees			6		52.05	J	60	?	N	3		
														6									
	36	10/11		1.50	96	75	79									52.69	J	55	<1	Ca	3-6		
53														1		53.01	J	75	<1	Ca	3		
														1									
								R3	F		53.6 m: Small voids in core along edges of calcite veins (calcite dissolution?) 53.66 m: Orange crystals in calcite rich joint surface, acid reaction			3		53.70	J	55	<1	Ca	6		
								R3	F							53.90	J	45	<1	N	14		
54	37	11		1.50	65	65	65							1		54.11	J	55 65	<1	N	3 18		

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None Cl: Clay Qtz: Quartz FeOx: Iron Ca: Calcite NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh SW: Slightly MW: Moderately HW: Highly CW: Completely RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 3: Slightly Rough, Undulating 5: Rough Undulating, Stepped 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-128

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m) 5 10 15	RUN LENGTH (m)	TCR (%) 25 50 75	RQD (%) 25 50 75	SCR (%) 25 50 75	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS	INSTRUMENT DETAILS
											(continued from previous page)		
55								R3	F		54.80 m: Many irregular fractures infilled with hard white mineral. Variable fracture orientation. Trace pyrite on some joint surfaces 55.06 m to 55.33 m: Series of fractures or open veins cutting core close to vertical, approximately 1 mm aperture, filled with hard whiite non-reactive mineral. 56.0 m to 56.40 m: Joints ~5 cm spacing, trace veins with white mineral infilling (no HCl reaction)		
								R3	F				
	38	11/12		1.50	100	44	57						
56								R3	F				
57	39	12		1.50	100	67	87						
58	40	12/13		1.50	90	90	90						
								R3	F		58.9 845.4 MAFIC VOLCANICS, Medium grained, fresh, massive, wih trace serpentinite infilled veins, chlorite alteration 59.3 m to 60.8 m: Trace pyrite throughout core		
59								R3	F				
60	41	13		1.50	100	100	100						
61								R3	F		60.8 m to 62.3 m: One joint set at 45 degrees, ~ 50 cm spacing		
	42	13/14		1.50	100	100	100						
62								R3	F		62.3 m to 63.0 m: Massive		
63	43	14		1.50	100	53	77	R3	F		63.0 841.3 63.0 m to 63.8 m: Jointed, fractured 63.1 m to 63.4 m: Broken rock		
								R3	F				
64								R3	F		63.8 m to 64.4 m: 1 joint set at 45 degrees, 5 to 10		

DISCONTINUITY DATA

FRACTURE FREQ. (No. Per 30 cm) 2 4	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
6		54.95	J	60	<1	N	3		
6		55.10	J	60	?	Py	14		
6		55.34	J	35	?	Ca	18		
4		55.46	J	45	1-3	Ca	3		
		55.60	J	45	1-3	N	3		
2		55.70	J	20	<1	Ca, Py	3		
		55.76	J	70	<1	N	18		
2		56.18	J	20	?	Py	18		
2		57.00	J	50	<1	N	14		
		57.04	J	50	<1	N	14		
5		57.20	J	50	<1	Sp	10		
		57.25	J	50	<1	Sp	10		
		57.30	J	50	<1	Sp	10		
2		57.32	J	55	<1	Sp	14		
		57.35	J	50	<1	Sp	10		
		57.50	J	50	<1	N	14		
		57.70	J	50	<1	N	10		
1		60.08	J	90	<1	Sp	14		
1		60.87	J	45	<1	N	10		
1									
		61.35	J	45	<1	N	10		
2		61.53	J	55	<1	N	3		
		61.63	J	40	<1	N	14		
1		62.02	J	60	<1	N	6		
		63.00	J	25	<1	N	14		
		63.40	J	45	<1	N	6		
		63.43	J	45	<1	Sp	6		
		63.50	J	45	<1	Sp	6		
		63.53	J	45	<1	Sp	6		
5		63.65	J	45	<1	N	6		

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None Cl: Clay Qtz: Quartz FeOx: Iron Ca: Calcite NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh SW: Slightly MW: Moderately HW: Highly CW: Completely RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 3: Slightly Rough, Undulating 5: Rough Undulating, Stepped 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-128

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m) 5 10 15	RUN LENGTH (m)	TCR (%) 25 50 75	RQD (%) 25 50 75	SCR (%) 25 50 75	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS	INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm) 2 4	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
											(continued from previous page)												
											cm spacing, no infill					63.70	J	60	<1	N	6		
	44	14/15		1.50	100	49	80	R3	F		64.4 m to 64.45 m: Massive, good rock quality					63.85	J	45	<1	N	6		
																63.90	J	45	<1	N	6		
																63.95	J	45	<1	N	6		
																64.02	J	45	<1	N	6		
65																64.15	J	45	<1	N	6		
								R3	F		65.0 m to 65.3 m: Broken core					64.35	J	45	<1	N	6		
								R3	F		65.3 m to 66.8 m: Fractured along joints and veins, serpentine-calcite infill at joint surfaces					64.50	J	40	<1	Sp, Ca	6		
																64.86	J	45	<1	N	6		
														3		65.75	J	45	<1	Ca	6		
66	45	15		1.50	100	20	50							3		65.84	J	20	1-3	Cl, Ca	14		
														3		66.06	J	45	<1	Sp	6		
								R3	F		66.15 m to 66.25 m: Shear zone, broken rock pieces from coarse sand size to coarse gravel size			2		66.20	J	45	-	-	-		
														3		66.40	J	45	<1	N	6		
														3		66.50	J	45	<1	N	6		
														3		66.60	J	30	<1	N	6		
67								R3	F		66.8 m to 68.3 m: white hard mineral on joint surfaces			3		66.63	J	30	<1	N	6		
														3		66.90	J	30	<1	Sp, Ca	6		
														3		67.08	J	65	<1	N	18		
														1		67.10	J	65	<1	Sp	6		
	46	15/16		1.50	90	40	63									67.25	J	25	<1	Ca?	6		
																67.70	J	65	<1	N	6		
68														2		67.80	J	60	<1	Sp	6		
																68.00	J	60	<1	N	14		
																68.05	J	50	<1	N	6		
														3		68.40	J	35	1-3	Sp, Ca	6		
														3		68.50	J	65	<1	N	14		
														3		68.53	J	65	?	N	18		
69	47	16		1.50	100	37	90							3		68.55	J	50	<1	N	18		
																68.70	J	35	<1	N	6		
																68.80	J	45	<1	N	6		
								R3	F		69.1 m to 69.25 m: Broken zone (coarse gravel size)			3		69.15	J	35	1-3	Sp, Ca	14		
														3		69.25	J	45	<1	N	3		
														1		69.27	J	45	<1	N	3		
																69.70	J	50	<1	N	6		
70														3		69.90	J	45	<1	N	6		
																69.97	J	75	<1	N	6		
																70.05	J	45	<1	Sp, Ca	6		
	48	16/17		1.50	70	13	40	R2	F		PICRITE, Fresh, very fine to fine grained, dark greenish grey 70.5 m to 71.3 m: Fractured zone												
71																							
								R1			71.3 m to 72.8 m: Fractured zone, particles can be broken by hand												
72	49	17		1.50	67	0	20																
								R2	F		72.8 m to 75.8 m: Fractured zone												
73																							
	50	17		1.50	50	27	24							6								PT2 2 x 10-7	

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None Cl: Clay Qtz: Quartz FeOx: Iron Ca: Calcite NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh SW: Slightly MW: Moderately HW: Highly CW: Completely RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 3: Slightly Rough, Undulating 5: Rough Undulating, Stepped 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-128

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m)	RUN LENGTH (m)	TCR (%)	RQD (%)	SCR (%)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS	INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm)	DISCONTINUITY DATA: FRACTURE ZONE	DISCONTINUITY DATA: DISCONT. DEPTH (m)	DISCONTINUITY DATA: DISCONT. TYPE	DISCONTINUITY DATA: ANGLE To Core Axis (TCA)	DISCONTINUITY DATA: APERTURE (<1,1-3,>3mm)	DISCONTINUITY DATA: INFILL TYPE	DISCONTINUITY DATA: JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
			5 10 15		25 50 75	25 50 75	25 50 75				(continued from previous page)			2 4									
74														6									
														1		74.17	J	50	<1	Sp	3		
																74.30	J	35	N/A	Sp	10		
75	51	17/18		1.50	83	8	40							6									
														6									
														6									
76														6									
	52	18		1.50	67	0	3							6									
														6									
77											77.3												
								RO to R2			827.0 MAFIC VOLCANICS, Dark green, fine grained, fresh			6									
														6									
78	53	18		1.50	60	0	0							6		78.00	J	0	<1	Cl	14		
								R2	F		Fine to very fine grained												
79																							
	54	19		1.50	67	20	31							6		79.70	J	60	<1	N	3		
														6		79.80	J	50	N/A	N	3		
80																79.90	J	50	<1	N	6		
														6		80.00	J	50	<1	N	6		
								R2	F		80.3 m to 81.8 m: Joint set approximately 50 degrees, tight aperture (less than 1 mm).			6									
81	55	19		1.50	80	67	35							4									
														6									
														6		81.40	J	50	<1	N	6		
																81.45	J	50	<1	N	6		
																81.50	J	50	<1	N	6		
																81.60	J	50	<1	N	6		
82								R2	F		81.8 m to 83.3 m: Joint set approximately 50 degrees, tight aperture (less than 1 mm).			6		81.70	J	50	<1	N	6		
														5		82.30	J	50	1-3	N	3		
	56	19/20		1.50	100	17	65							5		82.50	J	35	<1	N	10		
																82.60	J	50	<1	N	6		
																82.80	J	40	<1	N	10		
														6		82.90	J	60	<1	N	6		
83														6		83.00	J	30	<1	N	3		

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:

DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack

INFILL TYPE: N: None Cl: Clay Qtz: Quartz FeOx: Iron Ca: Calcite NC: Non-Cohesive

ROCK MASS WEATHERING: F: Fresh SW: Slightly MW: Moderately HW: Highly CW: Completely RS: Residual Soil

JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 3: Slightly Rough, Undulating 5: Rough Undulating, Stepped 6: Very Rough, Stepped

HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-128

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m) (5 10 15)	RUN LENGTH (m)	TCR (%) (25 50 75)	RQD (%) (25 50 75)	SCR (%) (25 50 75)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS
											(continued from previous page)	
84	57	20		1.50	93	29	44	R2	F		83.3 m to 84.8 m: At least two joint sets (approximately 40 degrees and 50 degrees) 83.6 m to 83.9 m: Highly broken zone	
								R2	F		84.2 m to 84.5 m: Highly broken zone	
85								R2	F		84.8 m to 86.3 m: Two joint sets (~55 degrees, and 65 degrees)	
	58	20		1.50	73	13	37					
86												
								R1 to R3	F		86.3 m to 87.8 m: Some rock flour infill along a few fractures, highly broken core	
87	59	21		1.50	50	0	0					
								R2	F		87.8 m to 89.3 m: Broken core	
88	60	21		1.50	93	7	7					
89												
90	61	21/22		1.50	93	27	45					
								R2	F		90.8 m 92.3 m: Broken core	
91												
	62	21		1.50	93	24	53					
92												
								R2	F		92.3 m to 93.8 m: Broken core	

INSTRUMENT DETAILS

DISCONTINUITY DATA

FRACTURE FREQ. (No. Per 30 cm) (2 4)	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)
3		83.05	J	50	1-3	N	10
3		83.10	J	50	<1	N	10
6		83.35	J	45	<1	N	6
6		83.80	J	40	N/A	N	3
		83.85	J	40	<1	N	6
3		84.00	J	50	<1	N	10
		84.10	J	60	<1	N	6
6		84.15	J	50	<1	N	3
		84.40	J	70	<1	N	10
6							
6		85.20	J	55	<1	N	6
		85.25	J	65	<1	N	14
6		85.30	J	65	<1	N	3
		85.50	J	50	<1	N	10
6							
6							
6							
6							
6							
6							
6							
6							
4							
6							
6		89.90	J	40	<1	N	3
6		90.20	J	40	<1	N	10
5							
2							
6		91.00	J	60	<1	N	3
3		91.30	J	70	<1	N	3
6							
6							
6							
6							
6							
6		92.70	J	60	<1	N	14

PERMEABILITY (m/sec)

SAMPLE RETAINED

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None Cl: Clay Qtz: Quartz FeOx: Iron Ca: Calcite NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh SW: Slightly MW: Moderately HW: Highly CW: Completely RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 3: Slightly Rough, Undulating 5: Rough Undulating, Stepped 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-128

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m) 5 10 15	RUN LENGTH (m)	TCR (%) 25 50 75	RQD (%) 25 50 75	SCR (%) 25 50 75	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION (continued from previous page)	DRILLING REMARKS	INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm) 2 4	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
93	63	21/22		1.50	90	25	47									92.80	J	50	<1	N	3		
																92.85	J	50	<1	N	6		
																93.30	J	30	<1	N	3		
																93.50	J	40	N/A	N	3		
94								R2	F		93.8 m to 95.3: Light whitish green, semi-transparent, soft mineral as infill, broken					93.90	J	55	N/A	N	3		
																93.95	J	60	1-3	N	3		
																94.05	J	60	1	N	3		
	64	22		1.50	73	0	43									94.10	J	40	1	N	3		
																94.40	J	65	1	Gyp	3		
95																							
								R2	F		95.3 m to 96.8 m: Broken core												
																95.70	J	65	N/A	N	6		
96	65	22/23		1.50	67	7	23									96.20	J	40	N/A	N	6		
											96.8 807.5												
97								R2	F		PICRITE, Dark green to dark grey, very fine grained, fresh, fibrous, serpentinite along joints												
	66	24		1.50	100	0	20																
98																							
								R2	F		98.3 m to 99.8 m: Trace disseminated pyrite throughout, broken												
99	67	24/25		1.50	97	40	33									99.20	J	15	N/A	N	3		
																99.40	J	50	1	N	3		
																99.50	J	50	N/A	N	3		
																99.60	J	30	N/A	N	3		
100								R2	F		99.8 m to 101.3 m: Fine grained plagioclase phenocrysts in fine grained matrix, broken core												
	68	25		1.50	97	7	21																
101																101.10	J	50	<1	N	3		
								R2	F		101.3 m to 102.8 m: Serpentinite along some joint surfaces, broken					101.40	J	60	<1	N	3		
102	69	25/26		1.50	87	20	10																

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None FeOx: Iron Cl: Clay Ca: Calcite Qtz: Quartz NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh SW: Slightly MW: Moderately HW: Highly CW: Completely RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 3: Slightly Rough, Undulating 5: Rough Undulating, Stepped 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-128

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m)	RUN LENGTH (m)	TCR (%)	RQD (%)	SCR (%)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS
			5 10 15		25 50 75	25 50 75	25 50 75				(continued from previous page)	
103								R0 to R2	F		103.15 m to 104.3 m: Infill along joints is whitish green, peels off, soft (locally occurring with calcite), increased serpentenite content, broken, locally friable (broken with hand) 103.4 m: clay infill	
	70	26		1.50	77	7	7	R0 to R2	F			
104								R2	F		104.4 m to 105.8 m: Very soft white mineral infills joints (gypsum?), ~ 1 mm thick, broken	
105	71	26		1.50	100	41	53	R2	F		105.3 m to 105.8 m: Very soft, white mineral infills (gypsum?)	
								R2	F		105.4 m: Serpentinite along joint surface.	
106								R0 to R2	F		105.8 m to 107.3 m: Locally containing magnetite, brecciated with magnetite and mica (?) forming matrix around angular volcanic fragments, some massive pyrite infills fractures	
	72	27		1.50	87	65	73					
107								R0 to R2	F		107.3 m: Abundant serpentinite along joints (smooth), irregular breaks (likely mechanical fractures)	
108	73	27		1.50	80	53	45					
								R0 to R2	F		108.8 m to 110.3: Serpentinite at joints, broken core.	
109	74	28		1.50	100	13	35					
110												
111	75	28		1.50	93	31	47	R2	F		111.4 m: Very soft, white mineral at joint (gypsum?), tight aperture, some calcite infill of joints, broken core	
									F	111.8 792.5		

INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm)	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
	2 4									
	6								PT3 4 x 10-8	
			102.90	J	15	N/A	Ca, Gyp	10		
	6									
	6									
	6									
	2									
	6									
	6									
	6		105.30	J	30	1-3	Gyp	10		
	6		105.40	J	45	N/A	N	3		
	6									
	5		105.90	J	30	1	N	10		
			106.00	J	60	N/A	N	10		
	2		106.10	J	55	1	N	10		
			106.30	J	40	<1	N	3		
	6		106.50	J	40	<1	N	3		
	6									
	2		107.00	J	40	1	N	10		
	6									
	6									
	1									
	1									
	1									
	6		109.20	J	30	<1	N	3		
	6									
	6									
	6									
	6									
	6		110.50	J	35	<1	Ca	3		
	6									
	6									
	6		111.20	J	55	<1	Gyp	3		
	6		111.30	J	50	<1	N	10		
			111.40	J	20	1	Gyp	3		

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None Cl: Clay Qtz: Quartz FeOx: Iron Ca: Calcite NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh SW: Slightly MW: Moderately HW: Highly CW: Completely RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 3: Slightly Rough, Undulating 5: Rough Undulating, Stepped 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-128

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m)	RUN LENGTH (m)	TCR (%)	RQD (%)	SCR (%)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS
			5 10 15		25 50 75	25 50 75	25 50 75				(continued from previous page)	
113	76	28/29		1.50	100	40	49	R2	F		MAFIC VOLCANIC, Fresh, dark greenish grey, fine to medium grained 112.0 m to 112.10 m: very thin, soft mineral infills (gypsum?), tight aperture (less than 1 mm) 112.65 m: Calcite infill of joints.	
114	77	29		1.50	90	16	53	R3	F		113.3 m to 114.8 m: Abundant mechanical break along thin veins (some calcite, some soft, white mineral).	
116	78	30		1.50	100	30	30	R3	F		114.8 m - 115.8 m: Calcite (gypsum?) through veins along core axis, infills veins (up to 5 mm thick), excellent rock quality after 115.8 m.	
117	79	30		1.50	100	60	93	R3	F		116.3 m to 117.8 m: Vein parallel to core axis (1 - 3 mm thick), very rough surface with soft, white mineral (gypsum?) infill	
119	80	31		1.50	100	0	33	R2	F		119.3 m: Fractured	
121	81	31		1.50	100	43	73	R3	F		120.8 m to 121.7 m: Fractured picrite or diorite with serpentinite infill at veins and joint surfaces	

INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm)	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
	2 4									
	6		112.00	J	45	<1	Gyp	3		
	6		112.05	J	20	<1	Gyp			
	6		112.65	J	35	<1	Ca	6		
	2		113.05	J	45	<1	Cl	3		
	5									
	6									
	6									
	5									
	6									
	4		116.52	J	80	<1	Ca?	14		
			116.54	J	80	<1	Ca?	14		
	1		116.59	J	80	<1	Ca?	14		
			116.61	J	80	<1	Ca?	14		
			116.85	J	30	<1	Ca	6		
	1		117.40	J	30	<1	Ca	6		
	1		117.70	J	40	<1	Ca	6		
	3		117.90	J	45	<1	N	6		
			118.00	J	80	>3	Sp	14		
	1		118.10	J	65	<1	N	14		
	1		119.60	J	85	<1	Sp, Cl	14		
	1		119.65	J	85	<1	Sp, Cl	3		
			120.20	J	80	<1	N	14		
	3		120.35	J	75	<1	Sp, Cl	6		
			120.40	J	35	-	Cl	14		
	4		120.45	J	80	<1	Sp	6		
			120.55	J	80	<1	Sp	6		
			120.65	J	80	<1	Sp	6		
			120.66	J	35	<1	Cl, Sp	3	PT4 4 x 10-10	

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None Cl: Clay Qtz: Quartz FeOx: Iron Ca: Calcite NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh SW: Slightly MW: Moderately HW: Highly CW: Completely RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 3: Slightly Rough, Undulating 5: Rough Undulating, Stepped 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-128

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m) (5 10 15)	RUN LENGTH (m)	TCR (%) (25 50 75)	RQD (%) (25 50 75)	SCR (%) (25 50 75)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS	INSTRUMENT DETAILS
122	82	32		1.50	100	27	37				(continued from previous page)		
								R3	F		122.3 m to 122.5 m: Fracture zone.		
123	83	32		1.50	100	60	70						
								R2	F		PICRITE, Dark green to dark grey, medium grained plagioclase phenocrysts in fine grained matrix, fresh		
124	84	33		1.50	100	51	60						
								R2	F		124.85 m: Trace calcite along joint, also soft white mineral (gypsum?) 125.2 m: Serpentinite along fracture surface.		
125	85	33		1.50	87	67	68						
								R2	F		126.8 m to 126.95 m: Mechanical break along veins, discontinuous breaks (not jointing).		
127	86	34		1.50	87	51	61						
								R2	F		128.3 m to 129.8 m: Abundant mechanical break along serpentinite (?) veinlets		
129	87	34		1.50	100	51	63						
								R3	F		129.8 m to 130.9 m: Joints and mechanical breaks along serpentine rich zones.		
130	88	35		1.50	87	80	80						
131													

DISCONTINUITY DATA

FRACTURE FREQ. (No. Per 30 cm) (2 4)	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
2		121.85	J	85	1-3	Sp	14		
		122.00	J	75	<1	Sp	14		
		122.45	J	60	-	Sp	6		
		122.60	J	30	<1	Sp	6		
2		122.80	J	60	<1	N	6		
		122.90	J	40	<1	Sp	14		
2		123.00	J	45	<1	Sp	6		
		123.20	J	45	<1	Sp	6		
3		123.30	J	75	<1	Sp	6		
		123.50	J	45	<1	N	6		
1		123.65	J	45	<1	Sp	6		
		124.85	J	50	<1	Ca	3		
		125.20	J	30	<1	Sp	3		
		125.25	J	60	-	Sp	3		
4		125.30	J	30	-	Sp	3		
				50	<1	N	14		
2				30	-	Sp	3		
		125.90	J	50	<1	N	14		
5				50	<1	Sp	3		
6									
6		126.50	J	30	<1	Sp	3		
5									
2									
5		127.50	J	50	<1	Sp	3		
4									
6		128.80	J	50	-	Sp	3		
5		129.20	J	30	<1	Sp	3		
3									
6									
5		130.00	J	70	1-3	N	3		
2									
3		130.50	J	50	<1	N	3		
3		130.90	J	20	<1	Sp	3		

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:

DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack

INFILL TYPE: N: None Cl: Clay Qtz: Quartz FeOx: Iron Ca: Calcite NC: Non-Cohesive

ROCK MASS WEATHERING: F: Fresh SW: Slightly MW: Moderately HW: Highly CW: Completely RS: Residual Soil

JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 3: Slightly Rough, Undulating 5: Rough Undulating, Stepped 6: Very Rough, Stepped

HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-128

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m)	RUN LENGTH (m)	TCR (%)	RQD (%)	SCR (%)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS	INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm)	DISCONTINUITY DATA: FRACTURE ZONE	DISCONTINUITY DATA: DISCONT. DEPTH (m)	DISCONTINUITY DATA: DISCONT. TYPE	DISCONTINUITY DATA: ANGLE To Core Axis (TCA)	DISCONTINUITY DATA: APERTURE (<1,1-3,>3mm)	DISCONTINUITY DATA: INFILL TYPE	DISCONTINUITY DATA: JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
			5 10 15		25 50 75	25 50 75	25 50 75				(continued from previous page)			2 4									
											131.3												
								R3	F		773.0 MAFIC VOLCANIC, Dark green to dark grey, fresh, local brecciation with quartz infilled fractures.					131.35	J	50	<1	N	3		
132	89	35		1.50	93	57	63									131.90	J	55	<1	N	3		
																132.00	J	40	1	Gyp	3		
133								R3	F		132.8 m: Weathering at joint					132.80	J	5	1-3	Gyp	14		
	90	35/36		1.50	93	75	80									133.60	J	55	<1	N	3		
134																							
								R3	F							134.70	J	60	1	N	14		
135	91	36		1.50	100	90	90									135.30	J	50	<1	Gyp	14		
											135.8												
136								R3	F		768.5 PICRITE, Dark green to dark grey, fine grained					135.80	J	35	-	N	3		
																136.20	J	50	<1	N	3		
	92	36/37		1.50	100	100	87									136.40	J	55	<1	N	3		
																136.60	J	50	<1	N	6		
137								R3	F		136.8 m: gypsum coating? Light whitish/ green					136.80	J	50	<1	Gyp	3		
																136.85	J	50	<1	N	10		
											137.3					137.10	J	65	1-3	Gyp	14		
								R2	F		767.0 MAFIC VOLCANIC, Dark green to dark grey, fine grained, fresh.					137.30	J	65	-	N	3		
																137.60	J	50	<1	Ca	3		
																137.80	J	50	<1	Ca	6		
138	93	37		1.50	100	95	100									138.05	J	55	1-3	Ca	14		
139								R2	F		138.8 m to 140.3 m: Rough joints (decreased serpentinite).					138.90	J	80	-	Ca	14		
																139.10	J	80	-	Ca	14		
	94	37/38		1.50	100	69	90									139.15	J	60	-	Ca	14		
																139.20	J	80	<1	Ca	14		
																139.22	J	80	<1	Ca	14		
																139.24	J	80	<1	Ca	14		
140																139.30	J	70	<1	Ca	14		
																139.80	J	80	<1	N	14		
																139.90	J	70	<1	N	3		
																140.15	J	70	<1	N	14		
								R2	F		140.3 m to 141.8 m: Some pyrite stringers in joints and disseminated pyrite throughout, epidote in veins,					140.40	J	60	<1	N	3		
																140.50	J	40	<1	Ca	14		

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None FeOx: Iron Cl: Clay Ca: Calcite Qtz: Quartz NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh HW: Highly SW: Slightly CW: Completely MW: Moderately RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 5: Rough Undulating, Stepped 3: Slightly Rough, Undulating 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-128

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m)	RUN LENGTH (m)	TCR (%)	RQD (%)	SCR (%)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS	INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm)	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
			5 10 15		25 50 75	25 50 75	25 50 75				(continued from previous page)			2 4									
141	95	38		1.50	93	100	100				fractures along calcite veins			6		140.70	J	60	<1	Ca	14		
																140.71	J	60	1-3	N	3		
																140.75	J	60	<1	Ca	3		
																140.90	J	65	<1	Ca	3		
														2		141.20	J	55	<1	Ca	14		
																141.40	J	55	<1	Ca	14		
														1									
142								R2	F		141.8 m to 143.3 m: Plagioclase phenocrysts in fine grained matrix, some epidote/ pyrite veins, disseminated pyrite throughout			2		142.00	J	40	<1	Gyp	3		
																142.05	J	65	1-3	Sp	10		
	96	38/39		1.50	93	80	87							2									
														3									
														4		142.80	J	60	<1	N	6		
143																142.85	J	70	<1	N	6		
																143.00	J	70	<1	N	14		
																143.05	J	55	<1	N	14		
								R2	F							143.32	J	60	<1	N	10		
														5		143.34	J	65	<1	N	3		
																143.45	J	60	<1	N	6		
																143.50	J	50	<1	N	6		
																143.60	J	50	<1	N	3		
144	97	39		1.50	93	63	82							1		143.62	J	45	<1	Sp	3		
																144.00	J	50	<1	N	6		
																144.10	J	60	<1	N	3		
																144.20	J	90	<1	N	3		
								R2	F							144.90	J	60	<1	N	6		
145														6		144.93	J	50	<1	N	3		
														4									
																145.40	J	50	<1	Ca	6		
	98	39/40		1.50	100	47	67							4		145.50	J	60	<1	N	3		
																145.78	J	60	<1	Sp	6		
146														2		146.00	J	40	<1	Ca	6		
																146.05	J	20	<1	N	10		
																146.10	J	50	<1	N	3		
								R2	F		Some calcite filled veins, pyrite and K-feldspar in veins			3									
														6		146.70	J	65	<1	N	6		
147	99	40		1.50	100	73	93									146.73	J	45	<1	N	6		
														1									
														4									
														2		147.68	J	40	<1	N	6		
																147.80	J	35	-	Ca	6		
148								R2	F		Medium to coarse grained plagioclase phenocrysts in fine grained matrix			2		148.00	J	35	1	Ca	6		
																148.07	J	50	<1	N	3		
														1		148.10	J	25	<1	Ca	6		
																148.20	J	65	<1	An	10		
	100	40/41		1.50	100	73	80							6		148.50	J	30	<1	N	6		
																148.70	J	30	-	Ca	6		
																148.90	J	45	1	Ca	6		
149														2		149.05	J	60	-	N	6		
														6		149.06	J	90	-	Ca	6		
								R2	F		Fractures along calcite veins, some quartz veins (with K-feldspar)					149.20	J	60	4	N	6		
																149.25	J	70	-	N	6		
																149.40	J	65	-	Ca	6		
														3		149.50	J	80	-	Ca	6		
150	101	41		1.50	87	67	80							2		149.60	J	80	-	Ca	6		
																150.20	J	65	-	Ca	6		

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None Cl: Clay Qtz: Quartz FeOx: Iron Ca: Calcite NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh SW: Slightly MW: Moderately HW: Highly CW: Completely RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 3: Slightly Rough, Undulating 5: Rough Undulating, Stepped 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-128

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m)	RUN LENGTH (m)	TCR (%)	RQD (%)	SCR (%)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS
			5 10 15		25 50 75	25 50 75	25 50 75				(continued from previous page)	
151								R2	F			
	102	41/42		1.50	100	67	64				151.4 Well developed calcite crystals within vein (fracture along vein)	
152												
								R2	F		152.3 / 752.0 152.2 m: Some oxidation along joint	
								R2	F		PICRITE, Dark green to dark grey, fine graned, fresh, some quartz veining	
153	103	42		1.50	100	53	67					
								R2	F		153.8 / 750.5 BRECCIA, angular fragments of volcanics in diorite, abundant quartz veining	
154												
	104	42/43		1.50	100	90	87					
155												
								R3	F		155.3 / 749.0 DIORITE, greenish grey, medium grained, fresh, quartz and calcite veining throughout, some brecciated fine grained fragments in diorite matrix, sulphides disseminated and concentrated along veins, epidote throughout.	
156	105	43		1.50	100	100	100					
								R3	F			
157												
	106	43/44		1.50	100	100	100					
158												
								R3	F		158.3 / 746.0 BRECCIA, angular fragments of diorite and mafic volcanics (fine grained), pyrite stringers throughout, quartz/ calcite veins, no increase in fractures at diorite/ breccia contact	
159	107	44		1.50	90	79	85					

INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm)	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
	2 4									
	2		150.22	J	65	-	Ca	6		
	5									
	1		151.00	J	60	<1	Ca	6		
			151.20	J	60	<1	N	6		
	3		151.40	J	50	1-3	Ca	6		
	6		151.41	J	55	1	Ca	6		
			151.60	J	70	<1	Ca	6		
	3		151.90	J	80	-	Ca	6		
			151.92	J	5	<1	Ca	6		
	6		152.00	J	60	-	Ca	6		
			152.03	J	60	-	N	14		
	1		152.20	J	30	1	Ca	6		
			152.40	J	55	<1	Ca	14		
	5		152.60	J	45	1-3	Ca	14		
			152.70	J	45	1-3	N	6		
	3		152.73	J	75	<1	N	3		
			152.80	J	40	-	N	14		
	2		153.05	J	40	<1	N	3		
			153.20	J	50	<1	Ca	6		
	6		153.45	J	55	<1	Ca	10		
			153.50	J	30	<1	N	3		
	6		153.60	J	30	<1	N	3		
	1		154.30	J	40	1-3	Gyp	14		
	3		154.60	J	80	<1	N	14		
			154.65	J	40	<1	Ca	14		
	2		155.10	J	70	<1	Ca	3		
	3		155.30	J	70	<1	Ca	3		
	1		155.90	J	60	1	Ca/An	6		
	1		156.33	J	70	<1	Ca	6		
	1		156.71	J	75	<1	N	18		
	1		156.92	J	50	1	N	14		
	1		157.23	J	75	<1	N	3		
	1									
	6		158.60	J	50	-	N	10		
	4		158.61	J	50	-	N	10		
			158.65	J	80	-	N	10		
	1		158.80	J	50	<1	Ca	6		
			159.10	J	55	<1	N	14		
	2									
			159.80	J	40	-	Ca	6		

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None FeOx: Iron Cl: Clay Ca: Calcite Qtz: Quartz NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh HW: Highly SW: Slightly CW: Completely MW: Moderately RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 5: Rough Undulating, Stepped 3: Slightly Rough, Undulating 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-128

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m) 5 10 15	RUN LENGTH (m)	TCR (%) 25 50 75	RQD (%) 25 50 75	SCR (%) 25 50 75	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS	INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm) 2 4	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
160								R3	F		(continued from previous page)			1		159.95	J	60	1-3	N	14		
														3		160.25	J	50	-	N	14		
	108	44/45		1.50	100	93	87							1		160.50	J	75	1-3	Ca	14		
161														1									
														1									
										161.3													
								R3	F	743.0	DIORITE, Grey, coarse-grained, containing hornblende/ plagioclase phenocrysts, interstitial fine grained quartz/ plagioclase, fresh			3		161.40	J	30	<1	Ca	18		
																161.50	J	40	1-3	Ca	6		
														3		161.55	J	70	<1	N	14		
162	109	45		1.50	100	70	73									161.60	J	55	<1	Ca	18		
																161.80	J	60	>3	Ca	18		
														4		162.00	J	50	<1	Ca	6		
																162.20	J	45	<1	Ca	6		
														2		162.35	J	55	<1	N	6		
																162.40	J	50	<1	N	14		
														5		162.50	J	45	<1	Ca	6		
																162.65	J	65	<1	Ca	6		
163								R3	F		Fractures along calcite veins, rough and planar			6		162.80	J	40	-	Ca	6		
																162.85	J	80	<1	Ca	6		
														4		163.20	J	70	-	Ca	6		
	110	45		1.50	100	67	67											40	-	Ca	6		
														2				40	<1	N	6		
																163.70	J	50	<1	-	14		
164														1				60		Ca	6		
																		70			14		
																		70					
																		40					
								R3	F									20					
																		65					
165	111	45/46		1.50	93	77	67																
														2		165.36	J	55	<1	Ca	6	PT5	
								R3	F		165.5 m to 165.8 m: Green to grey, abundant epidote. No discontinuities at contact.					165.50	J	35	<1	N	6	7 x 10-9	
														1		165.71	J	60	<1	N	14		
								R3	F														
166																							
														2		166.16	J	20	<1	Ca	18		
																166.31	J	65	<1	Ca	3		
	112	46		1.50	100	100	100							2		166.59	J	45	<1	N	3		
																166.75	J	40	<1	N	6		
167																							
								R3	F														
														2		167.45	J	60	<1	N	3		
																167.50	J	60	?	N	18		
168	113	46/47		1.50	100	96	100																
														2		168.23	J	60	<1	N	3		
																168.40	J	25	<1	N	6		
169								R3	F		168.8 m to 170.3 m: Sub-vertical veining. Fractures along calcite veins.												

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None Cl: Clay Qtz: Quartz FeOx: Iron Ca: Calcite NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh SW: Slightly MW: Moderately HW: Highly CW: Completely RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 3: Slightly Rough, Undulating 5: Rough Undulating, Stepped 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-128

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m)	RUN LENGTH (m)	TCR (%)	RQD (%)	SCR (%)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS	INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm)	DISCONTINUITY DATA: FRACTURE ZONE	DISCONTINUITY DATA: DISCONT. DEPTH (m)	DISCONTINUITY DATA: DISCONT. TYPE	DISCONTINUITY DATA: ANGLE To Core Axis (TCA)	DISCONTINUITY DATA: APERTURE (<1,1-3,>3mm)	DISCONTINUITY DATA: INFILL TYPE	DISCONTINUITY DATA: JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
			5 10 15		25 50 75	25 50 75	25 50 75				(continued from previous page)			2 4									
	114	47		1.50	100	100	100							6									
170																169.94	Vein	5	<1	Ca	6		
														2		170.15	Vein	0	<1	Ca	14		
								R3	F							170.63	J	65	<1	Ca	6		
								R3	F		170.7 m to 171.0 m: Sub-vertical calcite filled joint or vein.			6		170.75	J	40	<1	Ca	6		
171	115	48		1.50	80	61	61									170.95	J	0	?	Ca	14		
														1									
														2		171.57	J	60	<1	N	3		
																171.65	J	60	<1	N	3		
172								R3	F					1		172.00	J	75	<1	N	3		
														2		172.20	J	75	<1	N	3		
	116	48		1.50	100	87	87									172.30	J	55	<1	N	3		
														1		172.50	J	60	<1	N	3		
														3									
173								R3	F		Calcite vein at 35 degrees, increased epidote/quartz												
								R3	F		173.2 m to 173.3 m: broken core			4		173.20	J	20	<1	Ca	6		
								R3	F		Weathering (oxidation) of joints at approximately 20 degrees. Joints within epidote (alteration).			1		173.40	J	30	1	Ca	6		
																173.50	J	15	1	Ca	6		
														3		173.80	J	20	1	Ca	6		
174	117			1.50	100	87	87									173.90	J	20	1	Ca	6		
														5									
																174.40	J	20	<1	N	6		
																174.50	J	50	<1	-	6		
														3		174.60	J	50	<1	Ca	14		
175								R3	F		176.3 m to 180.8 m: Medium to coarse grained plagioclase, amphibole			3		174.90	J	45	<1	Ca	6		
																175.00	J	65	3	Ca	14		
																175.02	J	65	1-3	Ca	6		
	118			1.50	100	67	43							1		175.20	J	55	<1	Ca	3		
														3		175.65	J	55	<1	Ca	14		
											175.65 m to 175.7 m: Joints at epidote and K-feldspar alteration, and are filled with calcite					175.70	J	50	<1	Ca	14		
176														2									
								R3	F		176.1 m to 175.65 m: Broken core			6		176.05	J	90	1	N	3		
								R3	F					1		176.60	J	50	<1	Ca	10		
														2		176.80	J	50	<1	Ca	3		
177	119	49		1.50	93	81	73							1		177.10	J	20	<1	Ca	10		
														4		177.55	J	50	-	Ca	14		
								R3	F		177.5 m to 177.7 m: Joints along epidote/calcite vein			4		177.60	J	80	<1	Ca	6		
																177.65	J	45	<1	N	6		
178														1		177.90	J	55	<1	Ep/Ca	6		
																178.10	J	55	<1	Ep/Ca	14		
														1									
	120			1.50	100	83	97									178.40	J	50	-	N	6		
														1		178.70	J	55	<1	N	3		
														3		178.90	J	70	<1	N	10		

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None FeOx: Iron Cl: Clay Ca: Calcite Qtz: Quartz NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh HW: Highly SW: Slightly CW: Completely MW: Moderately RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 5: Rough Undulating, Stepped 3: Slightly Rough, Undulating 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-128

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m)	RUN LENGTH (m)	TCR (%)	RQD (%)	SCR (%)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS
			5 10 15		25 50 75	25 50 75	25 50 75				(continued from previous page)	
180	121			1.50	100	87	100	R3	F		179.3 m to 180.8 m: Local epidote alteration, some fractures	
181	122	51		1.50	87	80	87	R3	F		180.8 m to 182.3 m: Joint set at 65 degrees, generally no infill of joints, tight aperture (less than 1 mm)	
182								R3	F		182.1 m: Quartz vein approximately 30 degrees, 1 cm thick, local epidote alteration 182.3 m to 183.8 m: Local epidote alteration	
183	123	51/52		1.50	100	100	100	R3	F			
184	124	52		1.50	100	67	93	R3	F			
185											185.3 719.0	
186	125	52/53		1.50	100	97	80	R3	F		BRECCIA, fragments of diorite (with potassic alteration) within mafic volcanics, locally altered to epidote	
187	126	53		1.50	100	67	80	R3	F		186.8 717.5 MAFIC VOLCANIC, Dark green to dark grey, fine grained with thin calcite veins	
188								R3	F		Some brecciated angular fragments of medium	

INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm)	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
	2 4									
	2		179.00	J	55	<1	N	3		
	2		179.40	J	55	<1	Ca	6		
			179.45	J	80	<1	N	10		
	1		179.50	J	80	-	Ca	14		
	1		180.20	J	80	1-3	-	18		
	2		180.40	J	70 10	<1	Ca Ep	6		
	2		181.00	J	65	<1	N	6		
	1		181.10	J	65	<1	N	6		
	1		181.50	J	40	<1	N	6		
			181.65	J	65	<1	N	3		
	4		181.85	J	65	<1	N	6		
			181.95	J	65	<1	N	6		
	2		182.05	J	35	<1	N	3		
			182.15	J	90	<1	N	6		
	1		182.50	J	85	<1	N	3		
			182.55	J	35	<1	N	6		
	3		182.90	J	45	<1	N	3		
	3		182.95	J	65	<1	N	10		
			183.20	J	80	<1	N	3		
	5		183.25	J	60	<1	N	3		
			183.30	J	35	<1	N	3		
	2		183.50	J	50	<1	N	3		
	2		184.00	J	20	<1	Ca	6		
	2		184.30	J	25	<1	Ca/Cl	3		
	2									
	1		184.70	J	20	<1	N	6		
			185.10	J	25	<1	Gyp	3		
	5		185.45	J	60	<1	N	6		
			185.70	J	65	<1	N	18		
	1		186.00	J	30	<1	Cl	10		
	1		186.30	J	30	<1	Cl	10		
	6									
	1									
	1		187.15	J	50	<1	Ca	6		
	3		187.17	J	50	<1	Ca	6		
	3									
	6		187.85	J	25	<1	Ca	6		
			188.20	J	75	-	N	6		
	1		188.40	J	30	<1	Ca	14		

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None FeOx: Iron Cl: Clay Ca: Calcite Qtz: Quartz NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh HW: Highly SW: Slightly CW: Completely MW: Moderately RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 5: Rough Undulating, Stepped 3: Slightly Rough, Undulating 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-128

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m) 5 10 15	RUN LENGTH (m)	TCR (%) 25 50 75	RQD (%) 25 50 75	SCR (%) 25 50 75	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS	INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm) 2 4	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
											(continued from previous page)												
189	127	53/54		1.50	87	73	83				grained diorite throughout, disseminated sulphides throughout and concentrated along vein boundaries, quartz and calcite veining throughout, calcite on most joint surfaces			1		188.76	J	50	<1	Ca	3		
														6		189.01	J	65	<1	N	10		
														6		189.31	J	10	?	Ca	18		
																189.50	J	65	?	Ca	18		
														2		189.65	J	50	?	Ca	14		
								R3	F							189.80	J	45	?	Ca	18		
190								R3	F														
											189.7 m: vug with calcite infill			1		190.24	J	35	<1	Ca	14		
	128	54		1.50	100	82	85							6		190.60	J	35	?	Ca	10		
191								R3	F		190.8 m to 191.1 m: Albite alteration along large quartz vein			1		190.90	J	40	<1	Ca	6		
														6									
								R3	F					3		191.40	J	40	<1	Ca	10		
																191.55	J	30	<1	Ca	14		
								R3	F							191.65	J	45	<1	Ca	6		
192	129	54		1.50	100	84	84				DIORITE, Light grey, medium to coarse grained, quartz/ calcite veins throughout, epidote/ sulphides disseminated and concentrated along vein margins.			1		192.35	J	55	?	Ca	6		
														1		192.56	J	75	<1	Ca	6		
193																							
														3		193.16	J	40	<1	Ca	6		
	130	54/55		1.50	100	93	93									193.26	J	50	<1	N	6		
																193.40	J	45	<1	Ca	6		
194														2									
																194.03	J	30	<1	Ca	6		
																194.19	J	70	>3	N	6		
								R3	F														
														1		194.70	J	70	<1	Ca	3		
195	131	55		1.50	100	95	100							1		195.15	J	60	<1	N	3		
														1		195.37	J	65	<1	Ca	14		
196								R3	F					1									
														2									
	132	55/56		1.50	81	81	81									196.40	J	65	<1	Ca	14		
197														1									
														1									
								R3	F					1		197.50	J	75	1	Ca	6		
198	133	56		1.50	100	89	91							1		197.97	J	55	<1	N	6		

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None Cl: Clay Qtz: Quartz FeOx: Iron Ca: Calcite NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh SW: Slightly MW: Moderately HW: Highly CW: Completely RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 3: Slightly Rough, Undulating 5: Rough Undulating, Stepped 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-128

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m)	RUN LENGTH (m)	TCR (%)	RQD (%)	SCR (%)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS	INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm)	DISCONTINUITY DATA: FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	DISCONT. ANGLE To Core Axis (TCA)	DISCONT. APERTURE (<1,1-3,>3mm)	DISCONT. INFILL TYPE	DISCONT. JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
			5 10 15		25 50 75	25 50 75	25 50 75				(continued from previous page)			2 4									
														2		198.03	J	45	<1	Ca	3		
														2		198.17	J	65	<1	Ca	6		
																198.20	J	70	?	Ca	6		
														2		198.33	J	35	<1	N	3		
																198.42	J	55	<1	Ca	14		
199											End of Hole at: 198.8 m												
	134	56		1.50	100	100	100				Shallow Monitoring Well: 50.8 mm (2") Schedule 80 PVC Standpipe with slotted screen. Screen 9.7 to 18.0 mbgl Filter pack 10.9 to 17.0 mbgl Deep Monitoring Well: 50.8 mm (2") Schedule 80 PVC Standpipe with slotted screen. Screen 70.1 to 90.5 mbgl Filter pack 71.7 to 90 mbgl Shallow monitoring well installed in an offset hole. Negligible changes in lithology over the short offset distance have been assumed. Van Ruth plug installed at 93.70 m.									
200																							
201																							
202																							
203																							
204																							
205																							
206																							
207																							

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None FeOx: Iron Cl: Clay Ca: Calcite Qtz: Quartz NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh HW: Highly SW: Slightly CW: Completely MW: Moderately RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 5: Rough Undulating, Stepped 3: Slightly Rough, Undulating 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-130

Klohn Crippen Berger

DATE STARTED: April 28, 2014	LOCATION: Kamloops, BC	BIT SIZE AND TYPE: HQ3 Impregnated Bit	SHEET 5 OF 24
DATE FINISHED: May 7, 2014	LOGGED BY: JC/BY/LB	RIG MAKE AND MODEL: A5	GROUND ELEVATION (m): 895.5
CLIENT: KGHM International	CHECKED BY: MAB	TOTAL DEPTH (m): 226.0	COORDINATES (m): N 5609281 E 683214
PROJECT NAME: Ajax Mine Groundwater Study	DRILLING CO.: Geotech Drilling Services Ltd.	BEDROCK DEPTH (m): 34.0	COORDINATE SOURCE: KGHM
PROJECT NO.: M09871A01	DRILLER: JL	AZIMUTH/ANGLE FROM VERT.: -70	

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m) (5 10 15)	RUN LENGTH (m)	TCR (%) (25 50 75)	RQD (%) (25 50 75)	SCR (%) (25 50 75)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS	INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm) (2 4)	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
35		1		1.50	40	0	80	R2	F		OVB logged in off-set KAX-14-114 PICRITE, dark green to dark grey, fine grained, smooth on fracture surfaces (serpentinite).Broken zone at bedrock contact. Unable to orient core.			6 6									
36		2		1.50	73	47	53	R3 to R1	F		35.50 m to 35.95 m: Intact rock, fresh. 35.95 m to 36.61 m: Very weak rock, can be broken down by hand in some areas, friable with green serpentenite on fracture surfaces, natural breaks infilled with crushed rock and green clay. Welded shear zone?			2 1 2		35.64 35.77 35.97 36.07	J J J J	60 50 90 35	<1 <1 >3 C, crushed 1-3 C, crushed rock	Cl N rock	3 6 - -		
37		3		1.50	93	69	93	R3 to R1	F		37.00 m to 38.00 m: Rock can be broken along weakened planes by hand, surfaces show smooth, wavy serpentinite, sometimes clay infilled.			1 2 6		37.60 37.65 37.74	J J J	50 65 25	<1 - 1	Sp Sp Sp, Cl	6 14 3		
38								R3 to R1	F		38.00 m to 38.50 m: Becomes more competent					38.10	J	40	1-3	Cl	3		
											38.5 857.0			1		38.45	J	45	<1	Ca	6		
39		3		1.50	100	47	80	R3 to R1 R3 to R1	F F		PICRITE, greenish grey to light green, fine grained, rock can be broken down by hand in some areas to reveal smooth, waxy surfaces with clay, clay filled microfractures throughout, friable 39.20 m to 40.00 m: Rock becomes light green/grey with higher degree of of clay alteration throughout. R1. Some calcite mineralization along sides of core. 39.37 m: Sub-horizontal joint or shear with clay and rushed rock infill.			3 2 2 2 2		38.68 38.78 38.81 39.04 39.11 39.37 39.52	J J J J J J J	30 25 35 90 90 90 70	1-3 <1 <1 <1 ? >3 Sp, Cl, crushed rock <1	Ca/Cl Sp N Sp Cl Sp N	3 3 3 18 16 - 3		
40								R3 to R1	F		40.00 m: Rock becomes less friable			6		39.73 39.80 39.94	J J J	90 40 35	>3 <1 1	Sp Cl Sp	3 6 6		
41		3/4		1.50	100	73	87	R3 to R1	F		40.6 m: Two 1-2 cm wide cemented shear zones ~ 45 degrees			2		40.30 40.35 40.62 40.89 41.09 41.28	J J J J J J	50 55 45 40 70 65	<1 <1 <1 <1 >3 C, crushed rock <1	Sp, Cl N N N Sp	6 6 14 18 - 18	PT1 5 x 10-9	
											41.5 854.0			6									
								R3 to R1	F		VOLCANICS, greenish grey, fine grained, massive, calcite/quartz veining, some epiodote bands, epidote			1 1		41.62	J	65	<1	N	18		

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None Cl: Clay Qtz: Quartz FeOx: Iron Ca: Calcite NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh SW: Slightly MW: Moderately HW: Highly CW: Completely RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 3: Slightly Rough, Undulating 5: Rough Undulating, Stepped 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-130

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m) 5 10 15	RUN LENGTH (m)	TCR (%) 25 50 75	RQD (%) 25 50 75	SCR (%) 25 50 75	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS
											(continued from previous page)	
		4		1.50	100	100	100				phenocrysts in mafic groundmass, calcite on joint surfaces	
43												Could not orient bottom 20 cm of core; was dropped tube
		4/5		1.50	100	80	100	R3	F		Unable to orient core	
44												
45		5		1.50	100	100	100					
								R3	F		44.5 m: Rock as above but with less calcite on joint surfaces. Variable serpentinite on joint surfaces	
46												
		5/6		1.50	100	93	100					
47												
48		6		1.50	100	93	100					
49												Run blocked; not oriented
											49.5 / 846.0	
		6		1.50	100	20	53	R3	F		VOLCANICS, dark green, medium grained, serpentinite on joint surfaces, local replacement of plagioclase phenocrysts with epidote	
50								R3	F			
											50.2 m to 50.5 m: Pyroclastic texture, rounded mafic rock clasts in fine grained matrix	
								R3	F		50.5 / 845.0	
51											VOLCANICS, dark greenish grey, mostly fine grained with some medium grained plagioclase crystals, some thick quartz veins, some epidote alteration at vein margins	
		7		1.50	100	80	100	R3	F		Unable to orient core.	
								R3	F			

INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm) 2 4	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
			42.00	J	30	<1	Ca	3		
	2		42.30	J	40	<1	Ca	6		
			42.42	J	55	<1	Ca	6		
	1		43.05	J	45	1	N	14		
	1		43.64	J	30	<1	Ca	6		
	2		44.06	J	40	<1	Ca	6		
			44.15	J	30	1-3	Qtz	6		
	2		44.32	J	35	<1	Ca	3		
	1		44.70	J	70	<1	N	14		
	1		44.95	J	55	<1	N/Sp	6		
			45.14	J	60	<1	N/Sp	6		
	2		45.38	J	60	<1	N	14		
	1		45.62	J	50	<1	N	14		
	1		45.66	J	60	<1	Ca	14		
	2		46.17	J	35	<1	N	14		
			46.19	J	35	<1	N	14		
	1		46.43	J	50	<1	Sp	3		
			46.90	J	75	<1	N	6		
	3		47.04	J	80	<1	Ca	6		
			47.13	J	45	<1	N	6		
	1		47.77	J	70	<1	Sp	3		
	2		47.85	J	55	<1	Cl	14		
			48.00	J	50	<1	N	14		
	2		48.20	J	35	<1	Sp	6		
			48.34	J	55	<1	Sp	6		
	1		48.63	J	65	<1	N	18		
	5		49.15	J	70	<1	N	14		
			49.20	J	40	1-3	N	14		
	3		49.50	J	30	<1	N	10		
	6									
	5		50.10	J	60	<1	N	3		
	3		51.00	J	90	1-3	N	14		
	2		51.20	J	65	<1	N	14		
			51.50	J	45	<1	N	6		

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None FeOx: Iron Cl: Clay Ca: Calcite Qtz: Quartz NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh HW: Highly SW: Slightly CW: Completely MW: Moderately RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 5: Rough Undulating, Stepped 3: Slightly Rough, Undulating 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-130

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m)	RUN LENGTH (m)	TCR (%)	RQD (%)	SCR (%)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS
			5 10 15		25 50 75	25 50 75	25 50 75				(continued from previous page)	
52		7/8		1.50	93	80	87	R3	F		53.2 m: Joint along quartz vein	Could not orient - loss assumed at bottom
53												
54		8		1.50	100	80	93	R3	F		54.8 m: Quartz vein (0.5 cm to 1.5 cm wide) at 40 degrees	
55												
56		8/9		1.50	100	73	93					
57		9		1.50	100	67	80	R3	F		57.5 m to 58.0 m: More broken/fractured section of rock	
58		9/10		1.50	87	53	67	R3	F		58.4 m to 58.6 m : Broken zone with clayey gouge infill	Run blocked. Driller reports a potential "void" at 58.6 m
								R3	F		58.6 m: Joint along quartz vein	
59								R3	F		59.2 m: Joint along serpentinite	
60		10		1.50	87	73	67	R3	F		60.1 m: Joint set at 60 degrees break along calcite vein. Locally brecciated	
61											61.0 834.5	

DISCONTINUITY DATA

INSTRUMENT DETAILS	FRACTURE FREQ. (No. Per 30 cm)	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
	2 4									
	2 5		51.80	J	75	<1	N	6		
	2		52.32	J	85	1-3	N	3		
	2 1		52.70	J	90	<1	N	3		
	4		53.10	J	70	<1	N	14		
			53.20	J	60	<1	N	10		
			53.30	J	45	<1	N	10		
	1				40					
	1		53.90	J	40	-	N	3		
	2		54.20	J	55	<1	N	8		
	2		54.35	J	60	<1	N	10		
	4				65					
			54.80	J	50	-	N	14		
	1									
	2		55.45	J	85	<1	N	10		
	1									
	5		55.90	J	50	<1	N	3		
			55.93	J	40	<1	N	10		
			56.00	J	35	-	N	3		
	2		56.30	J	40	<1	N	6		
	2		56.80	J	45	<1	N	14		
	2		57.10	J	35		<1			
			57.30	J	80	<1	N	14		
	3		57.65	J	50	<1	N	14		
	6		57.75	J	40	<1	N	6		
	2		58.10	J	60	<1	N	6		
					20					
	6		58.40	J	25	<1	Cl	3		
			58.60	J	0	<1	N	3		
	2									
	3		59.20	J	70	-	N	10		
	2									
	3		59.90	J	60	<1	N	6		
			60.10	J	50	1-3	N	3		
	4		60.15	J	50	1-3	Ca	14	Straddle 2 8 x 10-8	
	4		60.70	J	80	<1	Ca	6		

CODES:

DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack

INFILL TYPE: N: None Cl: Clay Qtz: Quartz FeOx: Iron Ca: Calcite NC: Non-Cohesive

ROCK MASS WEATHERING: F: Fresh SW: Slightly MW: Moderately HW: Highly CW: Completely RS: Residual Soil

JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 3: Slightly Rough, Undulating 5: Rough Undulating, Stepped 6: Very Rough, Stepped

HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-130

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m) 5 10 15	RUN LENGTH (m)	TCR (%) 25 50 75	RQD (%) 25 50 75	SCR (%) 25 50 75	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS	INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm) 2 4	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
											(continued from previous page)												
62		10/11		1.50	100	87	93	R3	F		VOLCANIC BRECCIA, dark grey/green mafic volcanics rounded to angular clasts in lighter green matrix, some thin calcite and quartz veining Unable to orient core.			3 2 1 3									
63		11		1.50	93	73	73							2 2 1		62.60 62.65 63.10 63.40	J J J J	35 80 50 30	1-3 1-3 <1 <1	N N N N	3 3 14 10		
64								R3	F		63.7 m to 64.0m: Mechanical core breakage. Driller had difficulty removing core from tube			6									
65		11/12		1.50	100	100	100							1 2		64.05 64.80	J J	30 30	<1 <1	N N	14 10		
66		12		1.50	93	87	93	R3	F		65.2 m: Joint along quartz vein at 40 degrees (beta angle = 180 degrees)	Could not orient core in bottom 30 cm of run		1 1									
67								R3	F		Unable to orient core.			1 2 1		66.60 66.90 67.20	J J J	35 40 75	<1 <1 <1	N - N	18 3 18		
68		12/13		1.50	87	67	73					Driller reports a potential "void". Run blocked		1 1 4									
69		13		1.50	93	93	93	R3 R3 R3	F F F					1 2 1		68.40 68.80 69.10 69.20 69.40	J J J J J	30 90 70 30 70	<1 <1 <1 <1 <1	Ca, Cl N N N N	6 18 10 10 10		
70								R3	F		Unable to orient core.	Could not orient. Broken end and horizontal fractures		1 1 1		69.90 70.20 70.50	J J J	60 90 60	<1 >3 1	N Gravel N	10 18 18		

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None Cl: Clay Qtz: Quartz FeOx: Iron Ca: Calcite NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh SW: Slightly MW: Moderately HW: Highly CW: Completely RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 3: Slightly Rough, Undulating 5: Rough Undulating, Stepped 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-130

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m)	RUN LENGTH (m)	TCR (%)	RQD (%)	SCR (%)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS	INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm)	DISCONTINUITY DATA: FRACTURE ZONE	DISCONTINUITY DATA: DISCONT. DEPTH (m)	DISCONTINUITY DATA: DISCONT. TYPE	DISCONTINUITY DATA: ANGLE To Core Axis (TCA)	DISCONTINUITY DATA: APERTURE (<1,1-3,>3mm)	DISCONTINUITY DATA: INFILL TYPE	DISCONTINUITY DATA: JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
			5 10 15		25 50 75	25 50 75	25 50 75				(continued from previous page)			2 4									
71		13/14		1.50	100	93	93	R3	F		71.0 m: Rock becomes more friable with serpentinization on some joint surfaces, some local areas can be broken by hand			1		70.70	J	75	<1	Cl	6		
								R3	F					2		70.92	J	40	<1	Sp	10		
								R3 to R1	F	71.5 824.0	71.35 m: 15 cm of crushed rock at end of run	Run bloked at 72.45 m, assume loss at block		6		71.10	J	75	?	N	14		
								R3 to R1	F		PICRITE, dark greenish grey, fine grained, variable degree of serpentinization and rock strength, some areas friable breaking along irregular serpentinized planes, waxy serpentinite on most joint surfaces, variable clayey alteration found on some joint surfaces			1		71.33	J	80	<1	N	18		
72		14		1.50	87	69	69							1		71.76	J	35	<1	Sp	10		
														6		71.90	J	40	<1	N	18		
																72.05	J	30	<1	Sp	3		
														1		72.15	J	30	<1	Sp	3		
73								R3 to R1	F		71.76 m: 3 parallel fractures closely spaced with <1 mm aperture	Assume loss from fractured zone (73.65 m to 73.85 m)		1									
								R3 to R1	F		73.0 m to 73.5 m: Competent, intact rock (R3), green, fine grained, calcite veins			6		73.45	J	10	<1	N	3	PT2 4 x 10-8	
		14		1.50	87	47	53				73.5 m to 74.1 m: Heavily altered picrite, serpenitnite throghout with fractured rock and clay, fracture surfaces smooth and waxy, breaks apart by hand			6									
74								R3 to R2	F	74.1 821.4				1									
											PICRITE, dark greenish grey, fine grained, some calcite and quartz veining, more competent than picrite above, not friable, smooth, waxy serpentinite and/or trace clay on fracture planes	Could not orient; drill spin											
75		15		1.50	100	80	80	R3 to R2	F		75.1 m to 75.2 m: Rubble zone, assumed drill break			2		74.90	J	35	<1	Sp	3		
																75.40	J	65	<1	N	6		
														1		75.80	J	45	<1	Sp	3		
76												Run blocked		1		76.10	J	10	<1	Sp	3		
																76.35	J	10	<1	Cl	3		
														6		76.63	J	20	<1	Cl	3		
		15		1.50	93	27	40	R3 to R2	F		76.7 m to 77.1 m: Sub-vertical discontinuity running along core axis, smooth surfaces			3		76.73	J	40	<1	N	3		
77																76.80	J	60	<1	N	3		
								R3 to R2	F		77.1 m to 77.5 m: Fractured zone with crushed rock, sand and clay. Friable rock			6		77.25	J	60	6	Cl, crushed rock			
														6								PT3 1 x 10-8	
												Run blocked at 78.34. Assume loss at block (78.34 m to 78.54 m)		2		77.55	J	60	?	N	3		
																77.65	J	80	<1	Ca	6		
78														1		77.90	J	80	<1	N	14		
		15/16		1.50	87	53	67							6		78.18	J	35	?	CL	6		
																78.30	J	30	<1	Sp, Cl	10		
								R3 to R1	F	78.5 817.0	VOLCANICS, greenish brown and grey, sand sized black mineral grains throghout, variable rock strength					78.67	J	30	<1	Sp, Ca	10		
79														1									
												Assume loss @ 79.9 m (drill spin marks on core)		1		79.22	J	40	<1	Ca	10		
		16		1.50	80	53	60							6		79.82	J	25	<1	Cl, Sp	10		
80																							

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None Cl: Clay Qtz: Quartz FeOx: Iron Ca: Calcite NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh SW: Slightly MW: Moderately HW: Highly CW: Completely RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 3: Slightly Rough, Undulating 5: Rough Undulating, Stepped 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-130

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m) (5 10 15)	RUN LENGTH (m)	TCR (%) (25 50 75)	RQD (%) (25 50 75)	SCR (%) (25 50 75)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS	INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm) (2 4)	DISCONTINUITY DATA: FRACTURE ZONE	DISCONTINUITY DATA: DISCONT. DEPTH (m)	DISCONTINUITY DATA: DISCONT. TYPE	DISCONTINUITY DATA: ANGLE To Core Axis (TCA)	DISCONTINUITY DATA: APERTURE (<1,1-3,>3mm)	DISCONTINUITY DATA: INFILL TYPE	DISCONTINUITY DATA: JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
											(continued from previous page)												
81		16		1.50	100	73	73	R3 to R1	F		81.44 m to 81.74 m: Sub-vertical fracture, smooth surfaces with trace calcite	Could not orient; drill spin and mechanical breakage in top half of run											
82								R3	F		82.0 / 813.5 VOLCANICS, dark greenish grey, mafic, fine grained with some medium to coarse grained plagioclase crystals, some calcite and quartz veining Unable to orient core.	Could not orient; neither ends lock in											
83		16/17		1.50	100	87	93																
84		17		1.50	100	60	73	R3	F		84.1 m: soft white mineral on joint surface, non-reactive to HCl	Could not orient; broken at bottom of run											
								R3	F														
85								R3	F														
86		18		1.50	100	93	100	R3	F			Could not orient; no two points of contact at one fracture. Driller reports drilling is difficult but excellent quality core											
87		18		1.50	93	80	93																
88								R3	F		88.0 m: Joint along calcite vein	Oriented at one end only (top end from previous run)											
89		18/19		1.50	100	87	100																
								R3	F		89.35 m: Slickensided joint surface	Only oriented from one end											

														6		80.27	J	30	<1	Ca	3		
														1		81.30	J	30	1-3	Ca, fractured rock	10		
														2		81.75	J	55	<1	N	14		
														3		81.77	J	55	<1	N	14		
																81.79	J	55	<1	Cl	14		
														1		82.07	J	25	?	trace Cl	14		
														1		82.40	J	15	<1	Gyp (?)	10		
														1		83.40	J	50	<1	N	14		
														1		83.70	J	70	?	N	3		
														1		83.90	J	60	<1	N	3		
														2		84.10	J	50	1-3	?	10		
														6		84.40	J	30	<1	Cl	3		
														6		84.80	J	45	>3	Cl	10		
														2									
														1		85.85		20	<1	N	14		
														1		86.00		65	-	N	3		
														1		86.30		40	<1	N	3		
																86.55		40	<1	Ca	3		
																86.80		30	<1	N	3		
																86.85		30	<1	N	14		
																87.20		40	<1	N	10		
																87.80		80	1	N	14		
																88.00		300	<1	Ca	3		
																89.35		40	<1	N	10		
																89.80		30	<1	N	3		

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None Cl: Clay Qtz: Quartz FeOx: Iron Ca: Calcite NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh SW: Slightly MW: Moderately HW: Highly CW: Completely RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 3: Slightly Rough, Undulating 5: Rough Undulating, Stepped 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-130

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m) 5 10 15	RUN LENGTH (m)	TCR (%) 25 50 75	RQD (%) 25 50 75	SCR (%) 25 50 75	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION (continued from previous page)	DRILLING REMARKS	INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm) 2 4	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
90		19		1.50	93	87	93									89.90		60	<1	N	3		
																90.50		30	<1	N	3		
91														2		91.30		50	<1	N	10		
														6		91.35		50	<1	N	10		
																91.40		40	<1	N	3		
		19		1.50	100	53	80							3		91.60		40	<1	Cl	3		
92																91.80		40	<1	N	6		
														2		92.00		60	<1	N	6		
														6		92.40		40	<1	Ca	3		
								R3	F		93.7 m: Joint along thin calcite vein	Could not orient		2		92.70		0	<1	Ca	10		
93														4									
		20		1.50	100	69	73							2		93.50		40	<1	N	3		
								R3	F		93.6 m to 94.0 m: Some mechanical damage at bottom of run					93.60		40	<1	N	3		
94								R3	F		94.0 m: Some sub-rounded to sub-angular volcanic fragments/clasts in rock	Oriented from one end only		4									
														2		94.25		45	<1	N	10		
														1		94.50		50	<1	N	3		
		21		1.50	93	67	73							4		94.70		20	<1	N	3		
95														6		95.00		40	<1	N	6		
														1		95.10		50	<1	Ca	6		
														2									
96								R3	F		Unable to orient core.			3		95.90		10	<1	N	18		
								R3	F		96.15 m to 96.45 m: Very broken core surrounding joint parallel to core axis					96.00		90	-	N	18		
		21/22		1.50	93	47	47	R3	F		96.2 m: Serpentinite along joint			6		96.20		40	<1	Ca	14	PT4 1 x 10-9	
																		0	<1	Sp			
														6		96.50		60	<1	N	6		
97																96.55		40	<1	N	6		
														5									
								R3	F		97.13 m: 5 cm of rubble	Run blocked at 97.9 m. Could not orient		6		97.10		0	<1	N	14		
																97.26		60	<1	N	6		
														6		97.36		60	<1	Ca	6		
		22		1.50	100	27	27									97.42		60	<1	N	6		
98														3		97.50		15	<1	Sp, Cl	14		
														6		98.00		65	4	Cl	6		
								R3	F		98.2 m: 20 cm of rubble					98.15		35	?	N	14		
														6									
												Could not orient; no drillers mark at end of run		3		98.63		45	1-3	Sp, Cl	14		
																98.73		50	<1	Sp, Cl	6		
99																98.83		45	1-3	Ca, Sp	3		
		22		1.50	100	73	93							1		99.28		40	<1	N	3		

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None Cl: Clay Qtz: Quartz FeOx: Iron Ca: Calcite NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh SW: Slightly MW: Moderately HW: Highly CW: Completely RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 3: Slightly Rough, Undulating 5: Rough Undulating, Stepped 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-130

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m)	RUN LENGTH (m)	TCR (%)	RQD (%)	SCR (%)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS
			5 10 15		25 50 75	25 50 75	25 50 75				(continued from previous page)	
100											100.0 795.5	
								R1	F		PICRITE, greenish grey, fine grained, heavily fractured with greenish white serpentinite and clay alteration throughout, calcite veining, friable, can break apart by hand. Unable to orient core.	Run blocked at 100.9 m. Assume loss at block (100.9 m to 101.15 m). Could not orient before block
		23		1.50	87	20	20					
101											101.2 794.3	
								R3	F		VOLCANICS, dark brownish/greenish grey, fine grained, some locally brecciated areas (angular volcanic clasts in fine grained matrix, sometimes associated with thin calcite veins), dessimated black sand-size minerals	
102		23		1.50	100	87	87					
103												
		23/24		1.50	100	80	87	R3	F		103.6 m to 103.8 m: Sub-vertical calcite vein cutting along core axis forming discontinuity	
								R3	F		103.8 m: 6 cm wide shear zone cutting core axis at 45 degrees, infilled with crushed, weak, friable rock	
104								R3	F		103.9 m: Shear zone as above	
105		24		1.50	100	93	93					Only able to orient top 0.7 m of run
106												Could only orient bottom 1.1 m of run
								R3	F		106.4 m: 5 cm thick rubble zone	
		24/25		1.50	100	93	93					
107								R3	F		107.0 m to 107.2 m: Weakened zone, friable and altered	
								R3	F		107.5 m: 10 cm thick rubble zone at top of run. Unable to orient core.	Cannot orient; rubble zones at top and within run
108		25		1.50	100	93	93					
								R3	F		108.5 m: 6 cm thick rubble zone	

INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm)	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
	2 4									
	2		99.47		40	<1	trace Ca	3		
	2		99.68		55	<1	Sp, Cl	14		
			99.72		50	<1	Ca	6		
	6		99.90		45	<1	Ca	6		
	6									
	6									
	2		101.63		20	<1	Sp, Cl	6		
			101.66		50	<1	N	6		
	1		102.00		60	<1	Ca	14		
	3		102.14		40	<1	N	3		
	2		102.80		25	<1	Sp	3		
	2		102.90		30	<1	Ca	14		
	6		103.50		70	<1	Cl			
	6		103.80		45	<1	Cl			
	1		104.16		50	<1	Cl, Sp			
	1		105.00		45	<1	Sp, Cl	10		
	1									
	1									
	1		106.00		30	<1	Sp, Cl	10		
	2		106.22		40	<1	Sp, Ca	10		
	1		106.30		35	<1	Ca	14		
			106.32		25	<1	Ca, Cl	3		
	1		106.47		30	<1	Sp, Ca	10		
	3		107.00		45	<1	Cl, Sp	10		
			107.15		30	<1	Ca, Sp			
	1									
	2		108.27		60	<1	N	14		
			108.28		50	<1	Ca	6		
	2		108.38		50	<1	N	6		
			108.42		65	<1	trace Ca	14		
			108.52		50	?	Ca	14		

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None Cl: Clay Qtz: Quartz FeOx: Iron Ca: Calcite NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh SW: Slightly MW: Moderately HW: Highly CW: Completely RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 3: Slightly Rough, Undulating 5: Rough Undulating, Stepped 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-130

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m) 5 10 15	RUN LENGTH (m)	TCR (%) 25 50 75	RQD (%) 25 50 75	SCR (%) 25 50 75	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION (continued from previous page)	DRILLING REMARKS	INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm) 2 4	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
110		25/26		1.50	100	80	100	R3	F		109.6 m to 109.8 m: 1 mm wide calcite vein cutting across core axis, forming discontinuity			1		108.64		30	<1	Ca, Sp	10		
																108.93		40	<1				
																109.32		60	<1	N	6		
														1		109.70		25	<1	Ca	3		
														1		109.88		50	<1	N	14		
														3		109.90		65	<1	Ca	6		
														5		109.92		70	<1	N	14		
																110.13		25	<1	Ca	14		
																110.18		45	<1	trace Ca	10		
111								R3	F		110.5 m: 20 cm thick rubble zone	Unable to orient top 20 cm of run - run oriented off bottom mark		6		110.28		40	<1	N	10		
																110.35		65	<1	trace Ca	6		
														1		110.78		30	<1	Sp, Ca	6		
		26		1.50	100	93	93									111.04		50	<1	Sp, Ca	6		
														2		111.18		40	<1	N	6		
																111.30		30	<1	trace Ca	6		
112														2		111.57		50	<1	Ca, Cl	6		
														1		111.89		75	<1	trace Ca	6		
														2									
		26/27		1.50	100	100	100									112.60		70	<1	Ca	10		
113														2		112.80		85	<1	Ca	10		
														2		113.20		30	<1	Ca	10		
														2				65					
												Could not orient		1									
								R3	F		113.8 m to 114.1 m: Very soft zone, can be peeled with pen, angular volcanic fragments in soft matrix (heavily sepentinized). Indurated Breccia. Unable to orient core.			1									
114		27		1.50	100	73	87	R3	F		114.2 m: Serpentinite at joint. Waxy, polished, can be broken by hand			4		114.20		40	<1	Ca	10		
														4		114.80		65	<1	Ca	3		
																114.85		90	<1	N	3		
115								R3	F		115.0 m: More serpentinite observed near joints; waxy and smooth	Could not orient		1		114.95		20	<1	N	3		
																115.05		60	<1	Cl	10		
														2		115.40		40	<1	Ca	14		
																115.60		60 70	<1	Ca	3		
		27/28		1.50	93	87	93							2		115.90		60	<1	Ca	3		
116														2		116.10		90	<1	N	14		
																116.30		80	<1	Ca	10		
								R3	F		116.5 m: Less serpentinite observed near joints; rougher discontinuity surfaces	Oriented from one end only		1		116.80		30	<1	N	6		
														3		116.90		90	<1	N	6		
117																117.00		35	<1	N	10		
		28		1.50	100	93	100							2		117.40		50	<1	N	6		
														2		117.55		30	<1	N	14		
																117.80		70	<1	Ca	6		
								R3	F		117.8 m: Joint along calcite vein			1									
118												Could not orient		2									
								R3	F		118.3 m: Serpenitnite in joint; glassy and fibrous			2		118.30		60	<1	N	3		
																118.40		40	<1	N	6		

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None FeOx: Iron Cl: Clay Ca: Calcite Qtz: Quartz NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh SW: Slightly MW: Moderately HW: Highly CW: Completely RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 3: Slightly Rough, Undulating 5: Rough Undulating, Stepped 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-130

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m) 5 10 15	RUN LENGTH (m)	TCR (%) 25 50 75	RQD (%) 25 50 75	SCR (%) 25 50 75	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS	INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm) 2 4	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
119		28/29		1.50	100	87	93				(continued from previous page)			2		118.70		50	<1	N	3		
														2		118.80		55	<1	Ca	6		
														1									
														1									
120																119.75		50	<1	N	10		
														3		119.90		50	<1	N	10		
		29		1.50	100	87	87							1		120.20		40	<1	N	14		
																120.30		60	<1	N	18		
														5		120.40		60	<1	N	6		
																120.65		40	<1	N	6		
121														1		120.70		50	<1	N	6		
												Could not orient		3		121.15		55	<1	N	6		
																121.20		70	<1	N	3		
														3		121.40		30	<1	N	10		
		29/30		1.50	100	93	87																
122														1		121.90		40	<1	Ca	3		
														1		122.40		55	<1	Ca	3		
												Could not orient		2		122.80		60	<1	N	3		
123		30		1.50	100	73	87							2		123.05		85	<1	N	10		
														2		123.50				Ca	3		
														3		123.75		40	<1	Ca	10	PT5 4 x 10-9	
124												Could not orient											
														1		124.40		70	<1	Ca	10		
		30/31		1.50	100	87	93							2									
125														1									
														4									
												Only oriented from one end		2		125.70		20	<1	N	14		
126														1		126.00		40	<1	N	14		
		31		1.50	100	53	87							1									
														3		126.50		30	<1	Ca	3		
																126.60		30	<1	Ca	10		
127														1		126.70		25	<1	Ca	6		
														3		127.15		40	<1	N	6		
																127.25		50	<1	N	3		
														2		127.35		50	<1	N	3		
		31		1.50	100	47	93									127.40		70	<1	N	14		
128														1		127.70		40	<1	N	3		
														2									

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None Cl: Clay Qtz: Quartz FeOx: Iron Ca: Calcite NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh SW: Slightly MW: Moderately HW: Highly CW: Completely RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 3: Slightly Rough, Undulating 5: Rough Undulating, Stepped 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-130

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m)	RUN LENGTH (m)	TCR (%)	RQD (%)	SCR (%)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS	INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm)	DISCONTINUITY DATA: FRACTURE ZONE	DISCONTINUITY DATA: DISCONT. DEPTH (m)	DISCONTINUITY DATA: DISCONT. TYPE	DISCONTINUITY DATA: ANGLE To Core Axis (TCA)	DISCONTINUITY DATA: APERTURE (<1,1-3,>3mm)	DISCONTINUITY DATA: INFILL TYPE	DISCONTINUITY DATA: JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
			5 10 15		25 50 75	25 50 75	25 50 75				(continued from previous page)			2 4									
														2		128.20		50	<1	N	3		
																128.45		30	<1	Ca	3		
												Could not orient		1		128.70		50	<1	N	14		
																128.85		50	<1	N	14		
129														3		129.00		70	<1	N	14		
		32		1.50	100	60	80							1		129.30		40	<1	N	14		
														1									
130														2		129.80		50	<1	Ca	3		
																129.85		50	<1	N	3		
														3		130.00		50	<1	N	3		
																130.12		50	<1	N	3		
														3		130.30		50	<1	N	3		
		32/33		1.50	93	73	100									130.50		40	<1	N	14		
131														1									
																130.90		30	<1	Ca	3		
														2		131.00		30	<1	Ca	10		
																131.10		30	>3	Ca	14		
														1									
												Could not orient											
132																							
		33		1.50	93	93	93							1									
133												Could not orient											
		33/34		1.50	100	93	100																
134														1		134.10		50	<1	Ca	3		
																134.30		55	<1	Ca	3		
												Could not orient		1									
135														1		135.00		70	<1	N	10		
		34		1.50	100	100	100																
														1									
136												Could not orient											
														1									
		34/35		1.50	93	93	93																
137																136.95		90	<1	Cl	3		
											137.5			2		137.40		25	<1	N	3		
								R1 to R3	F		758.0 VOLCANICS, dark greenish grey, fine grained, some	Night shift didn't		1		137.64		20	1-3	Sp, Cl	10		

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None Cl: Clay Qtz: Quartz FeOx: Iron Ca: Calcite NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh SW: Slightly MW: Moderately HW: Highly CW: Completely RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 3: Slightly Rough, Undulating 5: Rough Undulating, Stepped 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-130

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m) 5 10 15	RUN LENGTH (m)	TCR (%) 25 50 75	RQD (%) 25 50 75	SCR (%) 25 50 75	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS	INSTRUMENT DETAILS
											(continued from previous page)		
138		35		1.50	100	93	100				locally altered (serpentinite and clayey gouge) zones are weak (R1) and friable, altered zones typically assoicated with calcite veins. Unable to orient core.	set ACE tool; could not orient	
139								R3	F		139.0 / 756.5 VOLCANICS, as above but with no altered zones. Sound rock.	Oriented off bottom mark only	
140		35/36		1.50	100	87	100						
141		36		1.50	100	33	47	R1	F		140.5 / 755.0 PICRITE, as above but wth fracturing and alteration throghout, rock fractures along smooth, irregular wavy planes typically with light green serpentinite and calcite on surfaces, rock in fractured areas is very weak and friable	Oriented off top mark only, rock too fractured in bottom 20 cm	
142								R3	F		142.0 / 753.5 VOLCANICS, dark greenish grey, fine grained, calcite veining. Sound rock.		
143		36/37		1.50	100	100	100						
144		37		1.50	100	100	100	R3	F		143.7 m: 2 cm wide low angle discontinuity filled with grey clay. Fractured rock with calcite on fracture surfaces. Shear?		
145													
146		37/38		1.50	100	93	100	R3	F		145.95 m to 146.35 m: More calcite veins, healed		
147		38		1.50	100	100	100						

DISCONTINUITY DATA

FRACTURE FREQ. (No. Per 30 cm) 2 4	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
2		138.51		60	<1	Sp	14		
		138.55		20	<1	Sp, Ca, Cl	10		
2		138.75		85	<1	Sp, Cl	10		
		138.86		70	<1	Sp, Cl	10		
1		139.14		70	<1	N	18		
2		139.83		55	<1	Sp, Cl, Ca	10		
		139.88		40	<1	trace Sp	10		
4		140.25		35	<1	Sp, Ca	6		
		140.36		55	<1	Sp, Ca	3		
		140.41		50	<1	Sp, Ca	14		
1		140.44		50	<1	Sp, Ca	16		
		140.80		45	<1	Sp, Ca	18		
3		140.86		60	<1	Sp, Ca	14		
		140.96		15	<1	Sp, Ca	10		
4		141.20		30	<1	Sp, Ca	14		
6									
6		141.80		35	<1	Ca	3		
1		142.60		40	<1	Ca	6		
1		143.33		70	<1	Ca, Cl	14		
1									
1		143.93		40	<1	N	14		
1		144.50		40	1	Sp, Ca	6		
1		144.80		25	<1	Sp, Ca	6		
1		145.80		50	1	Ca	6		
1		145.90		65	<1	Ca, Cl	6		
		146.20		50	<1	Ca, Cl	18		
2		146.30		30	1	Ca	3		
1		147.00		65	<1	Ca	10		
1		147.18		50	>3	Ca, Cl, crushed			

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None Cl: Clay Qtz: Quartz FeOx: Iron Ca: Calcite NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh SW: Slightly MW: Moderately HW: Highly CW: Completely RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 3: Slightly Rough, Undulating 5: Rough Undulating, Stepped 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-130

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m) 5 10 15	RUN LENGTH (m)	TCR (%) 25 50 75	RQD (%) 25 50 75	SCR (%) 25 50 75	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION (continued from previous page)	DRILLING REMARKS	INSTRUMENT DETAILS
148								R3	F		147.18 m to 147.21 m: Healed shear zone (~ 50 degrees) infilled with fractured rock, calcite and clay		
149		38		1.50	100	100	100	R3	F		148.59 m to 148.63 m: Healed shear with crushed rock and clayey gouge infill		
150		39		1.50	100	100	100						
151												Could not orient	
152		39		1.50	100	100	100						
153		39/40		1.50	100	87	93	R3	F		153.1 m: Rock remains intact but with many clayey gouge and calcite filled, well healed microfractures, brecciated with some angular fragments of mafic rock	Could not orient; fractured bottom and drill spin at top of run	
154											154.2		
155		40		1.50	100	100	100	R1 to R2	F		741.3 BRECCIA, angular to sub-rounded mafic volcanic clasts (up to 10 cm diameter) welded together with calcite, quartz, and/or clayey and sandy infill, can be split by hand along weakened planes, intact rock in splits, variable serpentinization		
156		40/41		1.50	100	100	100	R3	F		156.2 m: Some reddish brown rock clasts and grey clasts with porphyritic texture		
											156.9		

DISCONTINUITY DATA

FRACTURE FREQ. (No. Per 30 cm) 2 4	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)
1		147.40		50	<1	rock trace Ca	
		147.66		60	<1	trace Ca	
1		148.46		30	<1	Ca	14
		148.61		55	>3	Cl, crushed rock	
1							
1		149.19		70	<1	Sp, Cl, Ca	14
1							
1		150.58		60	<1	Ca	6
1		150.83		50	<1	Ca	14
		151.20		45	<1	Ca	14
1		151.76		70	1-3	Sp, Cl, Ca	
2		152.40		70	<1	Ca, Cl	3
		152.44		70	<1	Ca, Cl	3
6							
		154.30		20	<1	N	14

PERMEABILITY (m/sec)	SAMPLE RETAINED
PT6 4 x 10-9	

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None FeOx: Iron Cl: Clay Ca: Calcite Qtz: Quartz NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh HW: Highly SW: Slightly CW: Completely MW: Moderately RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 5: Rough Undulating, Stepped 3: Slightly Rough, Undulating 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-130

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m)	RUN LENGTH (m)	TCR (%)	RQD (%)	SCR (%)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS	INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm)	DISCONTINUITY DATA: FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	DISCONTINUITY DATA: ANGLE To Core Axis (TCA)	DISCONTINUITY DATA: APERTURE (<1,1-3,>3mm)	DISCONTINUITY DATA: INFILL TYPE	DISCONTINUITY DATA: JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
			5 10 15		25 50 75	25 50 75	25 50 75				(continued from previous page)			2 4									
157								R3	F		738.6 MAFIC VOLCANICS, locally brecciated with cleyey gouge and serpentinite, thin calcite veins												
158		41		1.50	100	100	100							1		158.23		35	<1	N	14		
159		41/42		1.50	100	87	100					Could not orient		2		158.60		80	<1	N			
																158.75		65	<1	N	14		
														3		158.90		65	<1	N	14		
														1		159.20		70	<1	Ca	10		
														1		159.55		70	<1	Ca, Cl	10		
160														2		159.90		90	<1	Ca, Cl	10		
																159.95		90		N	3		
161		42		1.50	100	100	100					Could not orient											
162		42/43		1.50	100	100	100					Could not orient		1		162.70		40	<1	N	10		
														1		162.85		40	<1	N	14		
163												Could not orient		6									
														6									
		43		1.50	100	60	67							1									
164														1									
														1									
												Could not orient. Loss assumed at end of run.		6		164.65		40	<1	Sp	3		
																164.70		80	<1	N	3	Straddle 1 1 x 10-8	
165				1.50	80	27	27							3									
														6		165.75		45	<1	Cl	3		
																165.80		45	<1	Cl	3		
166												Run blocked. Could not orient		6		166.20		80	<1	N	3		
																166.25		50		N	3		

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:

DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack

INFILL TYPE: N: None Cl: Clay Qtz: Quartz FeOx: Iron Ca: Calcite NC: Non-Cohesive

ROCK MASS WEATHERING: F: Fresh SW: Slightly MW: Moderately HW: Highly CW: Completely RS: Residual Soil

JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 3: Slightly Rough, Undulating 5: Rough Undulating, Stepped 6: Very Rough, Stepped

HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-130

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m) (5 10 15)	RUN LENGTH (m)	TCR (%) (25 50 75)	RQD (%) (25 50 75)	SCR (%) (25 50 75)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS	INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm) (2 4)	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
167				1.50	87	20	27				(continued from previous page)			2 6 6 6		166.50		50	<1	N	3		
																167.40		70	<1	Cl	10		
168				1.50	80	53	67					Run blocked. Could not orient		1 3 3		168.00 168.30 168.40		30 75 50	<1 <1 <1	Cl N N	14 10 6		
169				1.50	100	47	53					Could not orient		3 2 1		169.30 170.10		50 70	<1 <1	N Cl	6 14		
170														1		170.30		30	<1	Cl	3		
171				1.50	100	53	87					Could not orient		2 1 2 4		170.70 171.10 171.50 171.70		0 60 50 90	<1 <1 <1 <1	Cl N Cl N	10 6 3 6		
172								R3	F		172.0 723.5 VOLCANICS, dark grey, fine grained, fractured			5		171.90		30	<1	Cl	6		
173		46		1.50	100	100	73					Could not orient		2 1 2 4 5		172.70 172.90 173.00 173.40		60 80 60 0	<1 <1 <1 <1	Cl Sp, Cl Sp, Cl Sp, Cl	6 6 6 6		
174		47		1.50	93	93	93					Could not orient		1 3		174.00 174.50		60 60	<1 <1	N N	6 6		
175		47		1.50	87	13	13					Could not orient. Loss assumed from 1.0 m to 1.2 m		6 6 6		175.33 175.43 175.60 175.75 175.87	S J S J J	45 45 45 0 45	5 cm <1 3 cm <1 C <1	Cl, crushed rock N , crushed rock	14 6 3 10 6		

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None Cl: Clay Qtz: Quartz FeOx: Iron Ca: Calcite NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh SW: Slightly MW: Moderately HW: Highly CW: Completely RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 3: Slightly Rough, Undulating 5: Rough Undulating, Stepped 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-130

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m) 5 10 15	RUN LENGTH (m)	TCR (%) 25 50 75	RQD (%) 25 50 75	SCR (%) 25 50 75	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS	INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm) 2 4	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
											(continued from previous page)												
														6		175.90	J	40	<1	Sp N N	6		
								R3	F		176.5 m to 176.6 m: Rubble zone	Run blocked at 0.9 m. Could not orient		6		176.66	J	10	<1	N	14		
								R3	F		176.8 m to 177.0 m: Rubble zone			6		176.98	J	65	<1	N	6		
177		47/48		1.50	100	47	47									177.13	J	60	<1	N	14		
														6		177.23	J	10	<1	trace Ca	14		
								R3	F		177.35 m to 176.45 m: Rubble zone					177.30	J	10	<1	trace Ca	14		
														1		177.81	J	55	<1	N	6		
178												ACE tool malfunction; could not orient		1		178.12	J	45	<1	N	14		
														2		178.41	J	45	<1	N	14		
														2		178.51	J	45	<1	N	10		
		48		1.50	100	47	67							6		178.80	J	10	<1	trace Cl	10		
179																178.88	J	35	<1	N	10		
														6		179.01	J	80	<1	Cl	3		
																179.07	J	45	<1	N	14		
											179.5			2		179.30	J	40	<1	N	6		
								R3	F		716.0 VOLCANICS, dark grey, fine grained, no signs of serpentinization/alteration, trace calcite veins	ACE tool malfunction; could not orient		2		179.70	J	45	<1	N	6		
																179.78	J	60	<1	N	6		
180														1		180.20	J	35	<1	N	6		
		48/49		1.50	100	80	100									180.40	J	35	<1	N	14		
														1									
																180.73	J	35	<1	N	14		
														3		180.77	J	25	<1	N	14		
181																180.90	J	20	<1	N	14		
												Oriented off bottom mark only		1		181.12	J	50	<1	N	6		
														1		181.43	J	25	<1	N	6		
		49		1.50	100	67	67																
								R3	F		181.76 m to 182.2 m: High angle (~ 15 degrees to core axis) fractured zone cutting across core, fractured rock healed with sandy/clayey infill. Rock in the fractured zone is friable and weak with serpentinization. Unable to orient core. 182.5 m to 182.72 m: Rubble zone, discing may indicate mechanical damage			6									
182														6		182.22	J	50	<1	N	18		
								R3	F			ACE tool malfunction; could not orient		6		182.62	J	45	<1	Cl	14		
																182.76	J	40	<1	Cl	6		
183																182.77	J	45		N	6		
		49/50		1.50	100	80	80							1		183.37	J	45	<1	Cl	14		
184												Could not orient. No top mark due to ACE malfunction; rubble at bottom												
														1		184.50	J	45	<1	N	3		
		50		1.50	100	93	93							1		184.80	J	80	1-3	N	18		
185														1		184.96	J	50	<1	N	18		
																185.20	J	55	<1	N	3		
														1		185.25	J	30	<1	trace Cl	3		

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None Cl: Clay Qtz: Quartz FeOx: Iron Ca: Calcite NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh SW: Slightly MW: Moderately HW: Highly CW: Completely RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 3: Slightly Rough, Undulating 5: Rough Undulating, Stepped 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-130

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m) 5 10 15	RUN LENGTH (m)	TCR (%) 25 50 75	RQD (%) 25 50 75	SCR (%) 25 50 75	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION (continued from previous page)	DRILLING REMARKS	INSTRUMENT DETAILS
186		50/51		1.50	100	93	100					Oriented off bottom mark only	
187											187.6		
		51		1.50	100	100	100	R3	F		707.9 VOLCANICS, grey, very fine grained (massive), trace calcite veins,		
188													
189											189.0	Could not orient; too much horizontal spin	
		51/52		1.50	100	100	100	R3	F		706.5 VOLCANICS, dark grey, fine grained, some quartz and calcite veins. Quartz and calcite vein along the contact between this unit and the one above with alteration (reddish brown) and minor brecciation		
190											190.0		
		52		1.50	100	87	87	R0 to R3	F		705.5 VOLCANICS, dark grey, very fine grained, some brecciated zones with heavy calcite veining and infilling, trace porphyritic texture, reddish brown alteration along some clast contacts	Oriented off top mark only	
191								R0 to R3	F				
								R0 to R3	F		191.15 m to 191.5 m: Rock becomes fractured and friable/altered, calcite and clay filled microfractures throughout		
								R0 to R3	F		191.5 704.0 191.27 m to 191.5 m: extremely weak rock	Oriented off bottom mark only	
192		52		1.50	100	87	87				VOLCANICS, dark grey, fine grained, fractured with clay and calicte filled microfractures throughout, rock is friable and serpentinized in fractured zones, green clayey gouge on joint surfaces		
193								R0 to R3	F		193.0 m to 193.74 m: Rock becomes intact and sound with sand to gravel sized volcanic clasts in fine grained mafic matrix. Breccia.	Oriented off top mark only	
		52/53		1.50	100	53	60						
194													
195												Could not orient; drill spin at 195.6 m	

DISCONTINUITY DATA

FRACTURE FREQ. (No. Per 30 cm) 2 4	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
1		186.01	J	60	<1	trace Cl	10		
1		186.40	J	60	<1	N	14		
		186.75	J	40	<1	N	18		
2		186.95	J	30	<1	N	18		
1		188.15	J	30	<1	N	3		
1		188.40	J	65	<1	N	3		
1		189.72	J	50	<1	N	6		
1		190.41	J	20	<1	N	3		
1		190.70	J	30	<1	Qtz	6		
6									
2		191.62	J	50	<1	Cl, Sp	10		
		191.75	J	40	<1	Cl	10		
1		191.90	J	65	<1	Cl	10		
		191.93	J	65	1-3	Cl, Sand			
1		192.30	J	55	<1	Cl	6		
2		192.51	J	50	<1	Sp, Cl	6		
		192.65	J	30	<1	trace Cl	6		
6									
2		193.45	J	55	1-3	Sp, Cl	6		
		193.52	J	70	1	Sp, Cl	14		
6		193.82	J	30	<1	Sp, Cl	10		
6		194.02	J	20	<1	Sp	14		
6									
6									
6									
		195.10	J	75	<1	trace Cl	6		

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None Cl: Clay Qtz: Quartz FeOx: Iron Ca: Calcite NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh SW: Slightly MW: Moderately HW: Highly CW: Completely RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 3: Slightly Rough, Undulating 5: Rough Undulating, Stepped 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-130

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m) 5 10 15	RUN LENGTH (m)	TCR (%) 25 50 75	RQD (%) 25 50 75	SCR (%) 25 50 75	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS	INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm) 2 4	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
											(continued from previous page)												
		53		1.50	87	20	20	R0 to R3	F		195.8 m to 196.0 m: Intact, sound rock at bottom of run. Unable to orient core.			6		195.25	J	50	<1	trace Cl	6		
196								R0 to R3	F		196.0 m: Rock becomes less altered (less serpentinization, not as friable), but still heavily fractured. Crushed rock infill in fractures	Run blocked @ 196.75 m. Loss assumed @ block (196.75 m to 197.0 m)		6									
														6									
														6									
		53/54		1.50	87	27	27																
197											197.0												
								R3	F		698.5 VOLCANICS, dark grey, fine grained, some calcite veins. Unable to orient core.					197.30	J	20	<1	trace Cl	18		
								R3	F		197.25 m to 197.35 m: Rubble zone												
								R3	F		197.5 m to 197.7 m: Rubble zone	Could not orient. Loss assumed 198.2 m to 198.5 m		6		197.90	J	60	<1	Cl	14		
198														3		198.05	J	50	<1	N	6		
		54		1.50	80	40	53																
								R3	F		198.5 m to 198.65 m: Rubble zone			6		198.65	J	55	<1	Sp, Cl	6		
											199.0			1		198.95	J	45	<1	Cl	6		
199								R3	F		696.5 VOLCANICS, competent (R3) to altered (R0) fractured mafic volcanic rock infilled by crushed rock, degree of fracturing is variable with some more intact zones and some more heavily fractured and altered zones. Unable to orient core.	Could not orient. Loss assumed at bottom		6		199.21	J	70		N	6		
														6		199.31	J	30		N	6		
		54		1.50	60	0	7							6		199.37	J	55		N	6		
200														6									
																200.60	J	50	<1	N	3		
																200.65	J	40	<1	N	6		
																200.80	J	45	<1	N	6		
201														3		200.90	J	0	<1	N	10		
		54/55		1.50	80	20	33							4									
														4		201.50	J	30	1	Cl	14		
														2		201.80	J	65	<1	N	14		
202												Run blocked at 202.4 m		6									
														6		202.40	J	65	<1	N	6		
								R3	F		202.5 m to 203.0 m: Broken zone					202.42	J	50	<1	N	6		
		55		1.50	80	33	53							2		202.50	J	50	<1	Sp	10		
203														2		202.70	J	65	<1	N	3		
																202.75	J	35		N	14		
												Run blocked at 203.9m											
204														6									
		55/56		1.50	73	33	40							6									
														2		204.70	J	45	<1	N	3		

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None FeOx: Iron Cl: Clay Ca: Calcite Qtz: Quartz NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh HW: Highly SW: Slightly CW: Completely MW: Moderately RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 5: Rough Undulating, Stepped 3: Slightly Rough, Undulating 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-130

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m)	RUN LENGTH (m)	TCR (%)	RQD (%)	SCR (%)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS	INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm)	DISCONTINUITY DATA: FRACTURE ZONE	DISCONTINUITY DATA: DISCONT. DEPTH (m)	DISCONTINUITY DATA: DISCONT. TYPE	DISCONTINUITY DATA: ANGLE To Core Axis (TCA)	DISCONTINUITY DATA: APERTURE (<1,1-3,>3mm)	DISCONTINUITY DATA: INFILL TYPE	DISCONTINUITY DATA: JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
			5 10 15		25 50 75	25 50 75	25 50 75				(continued from previous page)			2 4									
205												Run blocked at 206.2 m		1		205.00	J	15	<1	N	3		
														5									
														6									
		56		1.50	80	0	0							6									
206														6									
																206.50	J	35	<1	Cl	14		
												Run blocked at 207.7 m		2		206.70	J	70	<1	N	3		
														3		207.00	J	70	>3	Cl	3		
207																207.10	J	65	<1	N	14		
		56/57		1.50	100	40	67							2									
														6									
																207.80	J	50	<1	N	14		
														3		207.90	J	50	<1	N	6	PT8 5 x 10-9	
208																208.00	J	60	<1	N	3		
												Run blocked at 208.6 m		2		208.05	J	25		Cl	14		
														6									
		57		1.50	80	20	20							6		208.70	J	60	<1	N	6		
209														6									
																209.30	J	30		N	10		
												Could not orient		6									
														6									
210														6									
		57/58		1.50	60	7	7																
																211.05	J	30	<1	Sp	3		
211												Could not orient		3		211.20	J	35	1	Cl	10		
														6		211.25	J	35	1	Cl	10		
		58		1.50	67	20	47							6		211.70	J	50	1-3	C, crushed rock			
212																							
								R0 to R3	F		212.5 683.0 PICRITE, grey, fine grained, strongly serpentinized and friable, breaks easily by hand but intact out of splits, some areas with volcanic clasts (angular to sub-rounded) within fine grained matrix	Run blocked at 213.2 m		1		212.60	J	35	<1	Sp	10		
														2		212.90	J	25	<1	Sp	10		
213														3									
		58/59		1.50	93	40	73							2		213.40	J	30	<1	Sp	3		
																213.70	J	30	<1	Sp	10		
214												Could not orient		4		214.20	J	90	<1	N	14		

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None Cl: Clay Qtz: Quartz FeOx: Iron Ca: Calcite NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh SW: Slightly MW: Moderately HW: Highly CW: Completely RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 3: Slightly Rough, Undulating 5: Rough Undulating, Stepped 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-130

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m) (5 10 15)	RUN LENGTH (m)	TCR (%) (25 50 75)	RQD (%) (25 50 75)	SCR (%) (25 50 75)	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS	INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm) (2 4)	FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
											(continued from previous page)												
														2		214.40	J	20		Sp, Cl	10		
																214.45	J	20		Sp, Cl	10		
		59		1.50	93	60	67							3		214.70	J	20	<1	Sp, Cl	10		
215																							
														4		215.35	J	80	<1	Cl	14		
														1		215.75	J	85	<1	N	6		
216														2		216.00	J	25	<1	N	14		
		59/60		1.50	87	87	87							2		216.20	J	30	<1	Sp	10		
														1									
														1		216.70	J	80	<1	Cl	6		
217																							
														3		217.15	J	75	<1	Sp	3		
																217.23	J	65	<1	N	6		
														4		217.44	J	30	<1	Sp	6		
																217.60	J	35	<1	Sp	6		
		60		1.50	100	60	80							4		217.76	J	65	<1	Sp	6		
218																							
														6		218.00	J	25	<1	Sp	3		
																218.15	J	60	<1	N	14		
																218.30	J	30	<1	Sp, Cl	3		
								R0 to R3	F		218.5 m to 218.65 m: Rubble zone with rounded particles at top of run	Run blocked at 219.8 m. Could not orient		6									
219																							
		60/61		1.50	93	27	33							6		219.10	J	25	<1	Sp	6		
														3		219.54	J	80	<1	N	18		
														6		219.95	J	30	<1	N	6		
220														6		219.98	J	45	<1	N	6		
												Loss assumed at top of run (220.0 m to 220.3 m). Could not orient		6									
		61		1.50	80	20	27									220.76	J	65	<1	N	10		
								R0 to R3	F		220.75 m to 221.15: Zone of intact, sound rock					220.82	J	35	<1	Cl	14		
221														6		221.15	J	45	<1	N	6		
														6									
												Run blocked at 220.0 . Loss assumed at block (222.0 m to 222.4 m). Could not orient		6		221.76	J	20	<1	Sp, Cl	10		
222														6									
		61		1.50	73	7	13							6									
														6									
223																							
												Loss assumed at top of run (223.0 m to 223.6 m). Could not orient		6									
		61/62		1.50	60	0	7							6									

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None Cl: Clay Qtz: Quartz FeOx: Iron Ca: Calcite NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh SW: Slightly MW: Moderately HW: Highly CW: Completely RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 3: Slightly Rough, Undulating 5: Rough Undulating, Stepped 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

Klohn Crippen Berger

GEOLOGIC DRILL LOG OF BOREHOLE NO.: KAX-14-130

DEPTH (m)	RUN NUMBER	BOX NUMBER	AVG DRILL RATE (min/m) 5 10 15	RUN LENGTH (m)	TCR (%) 25 50 75	RQD (%) 25 50 75	SCR (%) 25 50 75	HARDNESS	ROCK MASS WEATHERING	LITHOLOGY GRAPHIC	DESCRIPTION	DRILLING REMARKS	INSTRUMENT DETAILS	DISCONTINUITY DATA: FRACTURE FREQ. (No. Per 30 cm) 2 4	DISCONTINUITY DATA: FRACTURE ZONE	DISCONT. DEPTH (m)	DISCONT. TYPE	ANGLE To Core Axis (TCA)	APERTURE (<1,1-3,>3mm)	INFILL TYPE	JRC (Joint Roughness Coefficient)	PERMEABILITY (m/sec)	SAMPLE RETAINED
											(continued from previous page)												
224								R0 to R3 R0 to R3	F F		224.5 m to 224.55 m: Rubble zone 224.55 m to 225.3 m: dark grey volcanics, fine grained, some brecciated areas, sound rock, trace microfractures	Could not orient		6 6		224.68	J	45	<1	Sp, Cl	14		
225		62		1.50	93	47	47	R0 to R3	F	225.3 670.2	VOLCANICS, greenish grey, fine grained, massive, calcite/quartz veining, some epiodote bands, epidote phenocrysts in mafic groundmass, calcite on joint surfaces			1 3 1		225.06 225.35	J J	10 15	<1 <1	Sp, Cl Sp, Cl	14 14		
226											End of Hole at: 226.0 m			6 6									
227											Overburden logged in off-set KAX-14-114												
228											Shallow Vibrating Wire Piezometer installed at 175.3 m; Deep Vibrating Wire Piezometer installed at 223.3 m												
229																							
230																							
231																							
232																							
233																							

KCBL_ROCK-SI_W/ DISCONTINUITIES-V3 140624 AJAX ROCK_ES.GPJ 140404 AJAX - ROCK.GDT 3/20/15

CODES:
DISCONT. TYPE: J: Joint B: Bedding S: Shear T: Tension Crack
INFILL TYPE: N: None Cl: Clay Qtz: Quartz FeOx: Iron Ca: Calcite NC: Non-Cohesive
ROCK MASS WEATHERING: F: Fresh SW: Slightly MW: Moderately HW: Highly CW: Completely RS: Residual Soil
JOINT ROUGHNESS COEFFICIENT (JRC): 0: Polished/Slickensided/Gouge Filled 1: Smooth, Planar 3: Slightly Rough, Undulating 5: Rough Undulating, Stepped 6: Very Rough, Stepped
HARDNESS: R0: Extremely Weak (<1) R1: Very Weak (1-5) R2: Weak (5-25) R3: Medium Strong (25-30) R4: Strong (50-100) R5: Very Strong (100-250) R6: Extremely Strong (>250)

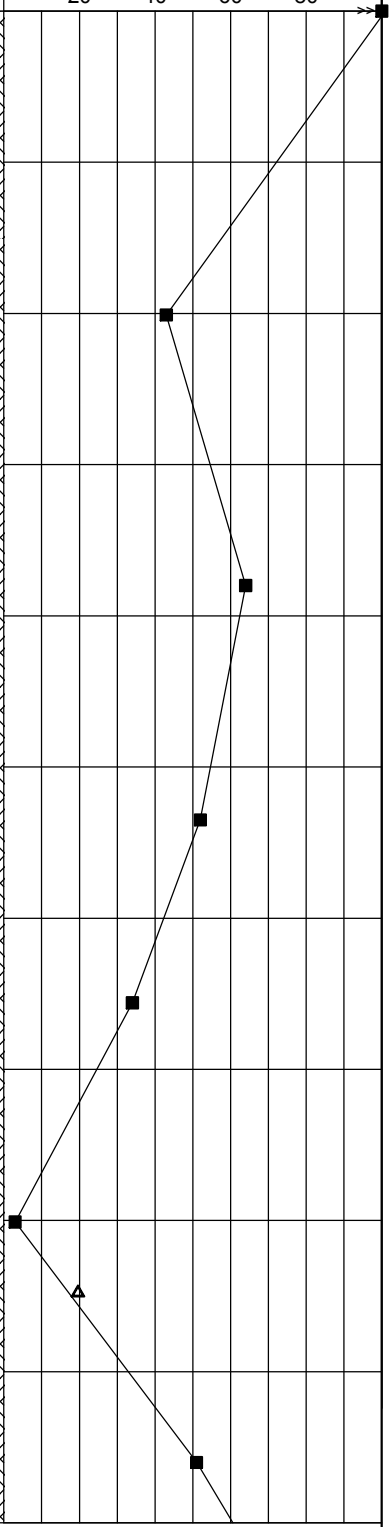
OVERBURDEN DRILLHOLE LOG KAX-14-107

STARTED: Feb 28, 2014 **FINISHED:** April 18, 2014
DRILL METHOD: PQ3 Coring
GROUND ELEV. (m): 896.2
COORDINATES (m): N 5609202 E 683223

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE AND NO.	SAMPLE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
	14 37 25/4"	SPT-KCB13 -05-0.0	75%		0.1 / 896.1 ORGANIC SILT (OL), low plasticity, some sand, hard (frozen), brown, organic odour, moist, some wood and rootlets, (TOPSOIL)	
1		Run 1	19%		SAND AND GRAVEL (SM), fine to coarse grained, some silt, well graded, dense, angular, grey to brown, dry, homogeneous, trace organics, (GLACIAL TILL) 1.6 m: Boulder	
2	8 20 23/4"	SPT-KCB13 -05-2.01	68%		2.0 m: Sand with some gravel, some silt to silty, brown SPT test stopped short because of a mechanical problem with the SPT hammer.	
3		Run 2	36%			
4	22 27 37	SPT-KCB13 -05-3.8	33%		3.8 m: Gravelly	
5		Run 3	18%			
6	6 20 32	SPT-KCB13 -05-5.35	147%		5.35 m: Trace gravel 5.8 / 890.4	
		Run 4	13%		No recovery 6.6	
7	7 19 15	SPT-KCB13 -05-6.56	67%		889.6 SAND (SM), fine to coarse grained, silty, trace gravel, well graded, compact to dense, brown, moist, slow dilatancy, homogeneous, (GLACIAL TILL)	
		Run 5	80%		8.0	
8	1 0 3	SPT-KCB13 -05-8.01	60%		888.1 SAND (SC), fine to coarse grained, clayey, some gravel, well graded, compact, subangular, max. size 50 mm, brown, moist, pocket penetrometer readings 1.0 kg/cm^2 to 2.5 kg/cm^2, homogeneous, (GLACIAL TILL)	
9		Run 6	47%			
					9.6	
10	5 25 26	SPT-KCB13 -05-9.60	56%		886.6 CLAY (CL), sandy, some gravel, low plasticity, very stiff, brown, moisture below plastic limit	

Continued Next Page

Su - kPa
25 75 125 175 225
UC/2 P.PEN/2
WATER1 WATER2 WATER3
% FINES SPT N LPT N
W_P% W% W_L%
20 40 60 80



Klohn Crippen Berger

PROJECT NO.: M09871A01
PROJECT: Ajax Mine Groundwater Study
LOCATION: Ajax Mine, Kamloops, BC
LOGGED BY: MC/DW **CHECKED BY: MAB**
SHEET 1 **OF** 15 **HOLE NO.:** KAX-14-107

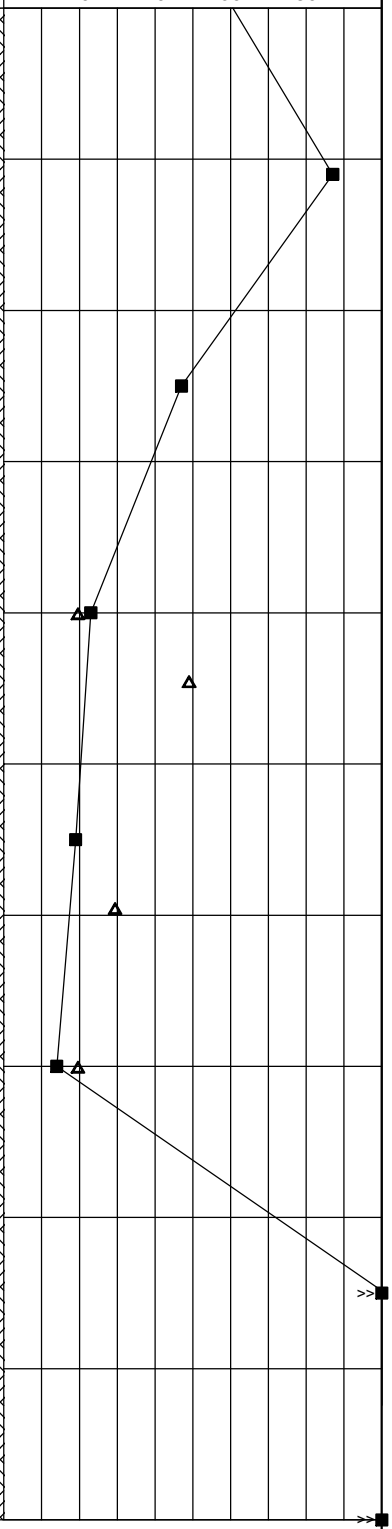
KCBL_OVERBURDEN_DRILLLOGS-SI 140624 AJAX OVERBURDEN_ES.GPJ KC_DATA.GDT 3/20/15

OVERBURDEN DRILLHOLE LOG KAX-14-107

STARTED: Feb 28, 2014 **FINISHED:** April 18, 2014
DRILL METHOD: PQ3 Coring
GROUND ELEV. (m): 896.2
COORDINATES (m): N 5609202 E 683223

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE AND NO.	SAMPLE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
		Run 7	35%		10.1 886.1 homogeneous, (GLACIAL TILL)	
					SAND (SC), fine to coarse grained, clayey, some gravel, well graded, compact, subangular, max. size 50 mm, brown, moist, pocket penetrometer readings 1.0 kg/cm^2 to 2.5 kg/cm^2, homogeneous, (GLACIAL TILL)	
11					11.2 885.0	
	15 47 40	SPT-KCB13 -05-11.10	89%		11.4 884.8 CLAY (CL), sandy, low plasticity, very stiff, brown, moisture below plastic limit, homogeneous, (GLACIAL TILL)	
		Run 8	0%		SAND (SC), fine grained, some clay, poorly graded, compact, brown, moist, homogeneous, (GLACIAL TILL)	
12					12.5 883.7	
	12 21 26	SPT-KCB13 -05-12.5	22%		SAND (SW), fine to coarse grained, some silt, trace gravel, dense, sub-angular, brown, moist, homogeneous, (GLACIAL TILL)	
13		Run 9	14%			
					14.0 882.2	
14	11 11 12	SPT-KCB13 -05-14.0	56%		CLAY (CI), silty, some sand, trace gravel, medium plasticity, stiff to very stiff, brown, moist, varved 1 to 5 cm, no dilatancy, (GLACIAL LACUSTRINE TILL) pocket penetrometer readings 1.0 kg/cm^2 to 2.5 kg/cm^2,	
		Run 10	100%			
15	6 10 9	SPT-KCB13 -05-15.5	89%			
		Run 11	24%			
16						
17	1 5 9	SPT-KCB13 -05-17.0	100%			
		Run 12	24%			
18					18.6 877.6 Gravel in bottom of split spoon	
	11 35 22/2"	SPT-KCB13 -05-18.5	22%		No recovery	
19		Run 13	0%			
20					20.0 Continued Next Page	

Su - kPa
25 75 125 175 225
UC/2 P.PEN/2
WATER1 WATER2 WATER3
% FINES SPT N LPT N
W_P% W% W_L%
20 40 60 80



Klohn Crippen Berger

PROJECT NO.: M09871A01
PROJECT: Ajax Mine Groundwater Study
LOCATION: Ajax Mine, Kamloops, BC
LOGGED BY: MC/DW **CHECKED BY: MAB**
SHEET 2 **OF** 15 **HOLE NO.:** KAX-14-107

KCBL_OVERBURDEN_DRILLLOGS-SI 140624 AJAX OVERBURDEN_ES.GPJ KC_DATA.GDT 3/20/15

OVERBURDEN DRILLHOLE LOG KAX-14-107

STARTED: Feb 28, 2014 **FINISHED:** April 18, 2014
DRILL METHOD: PQ3 Coring
GROUND ELEV. (m): 896.2
COORDINATES (m): N 5609202 E 683223

Su - kPa: 25 75 125 175 225 | UC/2 P.PEN/2 | WATER1 WATER2 WATER3 | % FINES SPT N LPT N | W_P% W% W_L% | 20 40 60 80

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE AND NO.	SAMPLE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
			22%		876.2 Gravel in bottom of split spoon	
	17, 28/1"	SPT-KCB13 -05-20.0			876.1 Washed cobbles in core barrel	
21		Run 14	67%			
					21.5 874.7 SILT (ML), some sand, non-plastic, rapid dilatancy, stiff to very stiff, medium sensitivity, brown to grey, moist, fissured	
22		Run 15	100%			
		Core-KCB13 -05-24.0	100%			
23		Run 16	100%			
24						
	25 75/5"	SPT-KCB13 -05-24.5	78%			
25		Run 17	74%			
26	27 50/5"	SPT-KCB13 -05-26.0	100% 0%		26.0 m: Becomes stratified with fine grained sand, layers up to 10 mm thick 26.3 869.9 No recovery	
27		Run 18				
	21 45 50/5"	SPT-KCB13 -05-27.5	88% 0%		27.5 868.7 27.5 m: 100 mm zone of SAND (SW), fine to coarse grained, trace silt, well graded, loose, subangular, brown to grey, moist, homogeneous (SLOUGH) 27.9 868.2 SAND (SM), fine grained, silty, poorly graded, dense to very dense, subangular, brown to grey, moist, homogeneous	
28		Run 19			No recovery - Driller noted that the sample was either washed away during drilling or fell out of the sample tube. - Driller noted that it felt like the material was "locking" the rods which could indicate a sandy material.	
29	14 14 10	SPT-KCB13 -05-29.0	0% 0%		No SPT sample recovered.	
30						

Continued Next Page

Klohn Crippen Berger

PROJECT NO.: M09871A01	
PROJECT: Ajax Mine Groundwater Study	
LOCATION: Ajax Mine, Kamloops, BC	
LOGGED BY: MC/DW	**CHECKED BY: MAB**
SHEET 3 **OF** 15	**HOLE NO.:** KAX-14-107

KCBL_OVERBURDEN_DRILLLOGS-SI 140624 AJAX OVERBURDEN_ES.GPJ KC_DATA.GDT 3/20/15

OVERBURDEN DRILLHOLE LOG KAX-14-107

STARTED: Feb 28, 2014 **FINISHED:** April 18, 2014
DRILL METHOD: PQ3 Coring
GROUND ELEV. (m): 896.2
COORDINATES (m): N 5609202 E 683223

Su - kPa: 25 75 125 175 225 — UC/2 — P.PEN/2
WATER1 WATER2 WATER3
% FINES SPT N LPT N
W_P% W% W_L%
20 40 60 80

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE AND NO.	SAMPLE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
		Run 20				
					30.5 / 865.7 SILT (ML), some gravel, some sand, low plasticity, stiff, interbedded with fine gravel, brown, moist (GLACIAL TILL)	
	40 50 40	SPT-KCB13 -05-30.5	78%			
31		Run 21	38%			
					32.0 / 864.2 31.9 m: 20 mm varved clay layer(GLACIAL LACUSTRINE TILL)	
32	9 13/3"	SPT-KCB13 -05-32.0	33%		SAND (SW), fine to coarse grained, trace silt, trace gravel, well graded, compact, max. size 30 mm, subangular, brown to grey, moist	
					32.5 / 863.7 Washed cobbles	
33		Run 22	29%			
			0%		33.5 / 862.7 No recovery.	
34		Run 23				
					35.0 / 861.2 SAND (SW), fine to coarse grained, gravelly, some silt, well graded, very dense, max. size 40 mm, subangular, brown to moist, gravel pockets	
35	12 40 57	SPT-KCB13 -05-35.0	89%			
			0%		35.5 / 860.7 No recovery.	
		Run 24				
36					36.3 / 859.9 36.3 m: Driller noted the bit was not advancing past 36.3 m and suspected bedrock contact. Circulation was normal.	
	3	SPT-KCB13 -05-36.3	67%		Washed gravel and cobbles, subrounded to rounded	
37		Run 25	43%			
38		Run 26	57%		38.8 / 857.4 Fractured Rock - Diorite (IMH or SLD), R4, fresh to slightly weathered, clay filled fractures up to 2 cm thick, clay is CLAY (CI) medium plastic, stiff, brown, moist	
					39.4 / 856.8 Rock - Diorite (IMH or SLD) R4, dark grey, fresh to slightly weathered. More details on Rock Log.	
39					39.5 / 856.7 End of Overburden Drill Log at 38.8 m. See Rock Log.	
40					Continued Next Page	

Klohn Crippen Berger

PROJECT NO.: M09871A01
PROJECT: Ajax Mine Groundwater Study
LOCATION: Ajax Mine, Kamloops, BC
LOGGED BY: MC/DW **CHECKED BY: MAB**
SHEET 4 **OF** 15 **HOLE NO.:** KAX-14-107

KCBL_OVERBURDEN_DRILLLOGS-SI 140624 AJAX OVERBURDEN_ES.GPJ KC_DATA.GDT 3/20/15

OVERBURDEN DRILLHOLE LOG KAX-14-107

STARTED: Feb 28, 2014 **FINISHED:** April 18, 2014
DRILL METHOD: PQ3 Coring
GROUND ELEV. (m): 896.2
COORDINATES (m): N 5609202 E 683223

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE AND NO.	SAMPLE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
41					Shallow Monitoring Well: 50.8 mm (2") Schedule 80 PVC Standpipe with slotted screen. Screen 29.9 to 38.0 mbgl Filter pack 27.0 to 38.5 mbgl Deep Monitoring Well: 50.8 mm (2") Schedule 80 PVC Standpipe with slotted screen. Screen 56.7 to 75 mbgl Filter pack 56 to76 mbgl Deep monitoring well installed in an offset hole. Negligible changes in lithology over the short offset distance were recorded.	
42						
43						
44						
45						
46						
47						
48						
49						
50						

Su - kPa
25 75 125 175 225
UC/2 P.PEN/2
WATER1 WATER2 WATER3
% FINES SPT N LPT N
W_P% W% W_L%
20 40 60 80

Klohn Crippen Berger

PROJECT NO.: M09871A01
PROJECT: Ajax Mine Groundwater Study
LOCATION: Ajax Mine, Kamloops, BC
LOGGED BY: MC/DW **CHECKED BY: MAB**
SHEET 5 **OF** 15 **HOLE NO.:** KAX-14-107

KCBL_OVERBURDEN_DRILLLOGS-SI 140624 AJAX OVERBURDEN_ES.GPJ KC_DATA.GDT 3/20/15

OVERBURDEN DRILLHOLE LOG KAX-14-108

STARTED: Mar 11, 2014 **FINISHED:** Mar 26, 2014
DRILL METHOD: PQ3 Coring
GROUND ELEV. (m): 901.4
COORDINATES (m): N 5609428 E 683140

Su - kPa: 25 75 125 175 225 — UC/2 — P.PEN/2
WATER1 WATER2 WATER3
% FINES SPT N LPT N
W_P% W% W_L%
20 40 60 80

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE AND NO.	SAMPLE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
0			3%		0.1 / 901.3 ORGANIC SILT (OL), sandy, low plasticity, stiff (frozen), brown, moist, homogeneous, some rootlets, (Topsoil)	
		Run 1			SAND (SM), fine to coarse grained, silty, some gravel, some cobbles, well graded, compact to dense, subrounded, max. size 500 mm, brown, moist to dry, homogeneous (GLACIAL TILL)	
2					2.1 / 899.4 SILT (ML), sandy, some gravel, low plasticity, stiff, brown, moist, slow dilatancy, homogeneous (GLACIAL TILL)	
			15%			
			8%			
3	6 13 15	SPT-KAX-14 -108-2.07				
					3.7 / 897.7 SILT and GRAVEL (ML), some sand, low plasticity, stiff, brown, moist, homogeneous, gravel is coarse grained, well graded, subrounded (GLACIAL TILL)	
4			3%			
		Run 2	15%			
5						
			6%			
	50/5"	SPT-KAX-14 -108-3.71	7%			
6		Run 3			6.7 / 894.7 CLAY (CL), silty, sandy, some gravel, low plasticity, very stiff, grey, drier than plastic limit, homogeneous (GLACIAL TILL); Pocket Pen > 4.5 kg/cm2	
			1%			
7			6%			
8	25 50 50	SPT-KAX-14 -108-5.21			8.2 / 893.2 GRAVEL (GC), fine to coarse grained, clayey, some sand, well graded, compact to dense, max. particle size of 2 cm, angular to sub-angular, grey, moist to wet, homogeneous (GLACIAL TILL)	
			2%			
		Run 4	5%			
9					9.5 / 891.9 SAND (SM), fine to coarse grained, gravelly, some silt, well graded, compact to very dense, max. particle size of 3 cm, flat, subangular to subrounded, grey	
			4%			
10			0%		(Continued Next Page	

Klohn Crippen Berger

PROJECT NO.: M09871A01
PROJECT: Ajax Mine Groundwater Study
LOCATION: Ajax Mine, Kamloops, BC
LOGGED BY: MC/MK **CHECKED BY: MAB**
SHEET 1 **OF** 18 **HOLE NO.:** KAX-14-108

KCBL_OVERBURDEN_DRILLLOGS-SI 140624 AJAX OVERBURDEN_ES.GPJ KC_DATA.GDT 3/20/15

OVERBURDEN DRILLHOLE LOG KAX-14-108

STARTED: Mar 11, 2014 **FINISHED:** Mar 26, 2014
DRILL METHOD: PQ3 Coring
GROUND ELEV. (m): 901.4
COORDINATES (m): N 5609428 E 683140

Su - kPa: 25 75 125 175 225 | UC/2 P.PEN/2 | WATER1 WATER2 WATER3 | % FINES SPT N LPT N | W_P% W% W_L%: 20 40 60 80

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE AND NO.	SAMPLE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
		Run 7			moist to wet, homogeneous (GLACIAL TILL)	
	20 26 26	SPT-KAX-12 -SPT-6.71	0%			
		Run 8				
		Run 5			11.0	
11	13 50/1"	SPT-KAX-14 -108-11.00	56%		890.4 GRAVEL (GW), fine to coarse grained, some sand, some cobbles, well graded, compact to very dense, max size of 30 mm, angular to subangular, grey, dry to moist, homogeneous	
			0%			
		Run 9				
12					12.5	
	18 32 53	SPT-KAX-14 -8.21	51%		888.9 SILT (ML), sandy, some gravel, low plasticity, very stiff, moist, brown, homogeneous (GLACIAL TILL)	
	6 20 38	SPT-KAX-14 -108-12.50				
13		Run 6 Run 10	0%			
			27%			
		Run 11				
					14.0	
14	19 20/2"	SPT-KAX-14 -108-14.00	100%		887.4 SILT AND SAND (ML), some gravel, low plasticity, very stiff, drier than plastic limit, homogeneous, sand and gravel are well graded, subrounded, grey (GLACIAL TILL)	
	18 37 58/5"	SPT-KAX-14 -108-9.50	60%			
		Run 12				
15					At 15.50 m: Becomes gravelly	
	15 28 40	SPT-KAX-14 -108-15.50	91%			
16		Run 13	99%			
					17.0	
17	50/2"	SPT-KAX-14 -108-17.00	200%		884.4 SAND AND GRAVEL (GM), fine to medium grained, silty, some stratified 40 mm sand and 60 mm coarse gravel, well graded, very dense, max size of 30 mm, subangular, grey, moist to wet (GLACIAL TILL)	
			54%			
		Run 14				
18						
	50/4"	SPT-KAX-14 -108-18.50	0%			
			36%			
19		Run 15				
					20.0	
20					Continued Next Page	

Klohn Crippen Berger

PROJECT NO.: M09871A01
PROJECT: Ajax Mine Groundwater Study
LOCATION: Ajax Mine, Kamloops, BC
LOGGED BY: MC/MK **CHECKED BY: MAB**
SHEET 2 **OF** 18 **HOLE NO.:** KAX-14-108

KCBL_OVERBURDEN_DRILLLOGS-SI 140624 AJAX OVERBURDEN_ES.GPJ KC_DATA.GDT 3/20/15

OVERBURDEN DRILLHOLE LOG KAX-14-108

STARTED: Mar 11, 2014 **FINISHED:** Mar 26, 2014
DRILL METHOD: PQ3 Coring
GROUND ELEV. (m): 901.4
COORDINATES (m): N 5609428 E 683140

Su - kPa: 25 75 125 175 225 — UC/2 — P.PEN/2
WATER1 WATER2 WATER3
★ % FINES ■ SPT N □ LPT N
W_P% W% W_L%
20 40 60 80

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE AND NO.	SAMPLE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
	50/4"	SPT-KAX-14 -108-20.00	100%		881.4 GRAVEL (GM), fine to coarse grained, sandy, trace silt, well graded, very dense, max size 25 mm, angular to subangular, greenish grey, moist, homogeneous (GLACIAL TILL)	
		Run 16	0%			
21		Run 17	0%			
	10 23 50/3"	SPT-KAX-14 -108-21.50	68%			
22		Run 18	51%			
		Run 19	21%			
23	8 50/3"	SPT-KAX-14 -108-23.00	50%			
		Run 20	82%			
24						
	16 33 56	SPT-KAX-14 -108-24.50	71%			
25		Run 21	0%			
26	21 54 50/5"	SPT-KAX-14 -108-26.00	72%			
		Run 22	75%		27.2 874.2 SAND (SM), fine to coarse grained, gravelly, some silt, trace cobbles, max size 80 mm, subangular to rounded, grey, moist, stratified with 200 mm to 300 mm thick layers of fine grained poorly graded sand (GLACIAL TILL)	
27	47 50/2"	SPT-KAX-14 -108-27.50	140%			
28		Run 23	59%			
29	49 50/2"	SPT-KAX-14 -108-29.00	130%			
		Run 24	83%			
30						

Continued Next Page

Klohn Crippen Berger

PROJECT NO.: M09871A01
PROJECT: Ajax Mine Groundwater Study
LOCATION: Ajax Mine, Kamloops, BC
LOGGED BY: MC/MK **CHECKED BY: MAB**
SHEET 3 **OF** 18 **HOLE NO.:** KAX-14-108

KCBL_OVERBURDEN_DRILLLOGS-SI 140624 AJAX OVERBURDEN_ES.GPJ KC_DATA.GDT 3/20/15

OVERBURDEN DRILLHOLE LOG KAX-14-108

STARTED: Mar 11, 2014 **FINISHED:** Mar 26, 2014
DRILL METHOD: PQ3 Coring
GROUND ELEV. (m): 901.4
COORDINATES (m): N 5609428 E 683140

Su - kPa: 25 75 125 175 225 — UC/2 — P.PEN/2
WATER1 WATER2 WATER3
★ % FINES ■ SPT N □ LPT N
W_P% W% W_L%
20 40 60 80

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE AND NO.	SAMPLE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
31		Run 25	83%			
	49 50/2"	SPT-KAX-14 -108-30.50	170%		30.8 / 870.7 SAND AND GRAVEL (SW), fine to coarse grained, some silt, well graded, max size 30 mm, subangular to subrounded, grey, dry to moist, homogeneous (GLACIAL TILL).	
		Run 26	113%			
32	50/4"	SPT-KAX-14 -108-32.00	180%			
		Run 27	100%			
33						
	53/6"	SPT-KAX-14 -108-33.50	153%			
34		Run 28	96%			
35	20 50/3"	SPT-KAX-14 -108-35.00	126%			
		Run 29	118%			
36						
	50 50/2"	SPT-KAX-14 -108-36.50	110%			
37		Run 30	106%		37.6 / 863.8	
38					End of Overburden Drill Log at 37.6 m. See Rock Log.	
39					Shallow Monitoring Well: 50.8 mm (2") Schedule 80 PVC Standpipe with slotted screen. Screen 31.4 to 36.0 mbgl Filter pack 32.3 to 35.4 mbgl	
40					Continued Next Page	

Klohn Crippen Berger

PROJECT NO.: M09871A01
PROJECT: Ajax Mine Groundwater Study
LOCATION: Ajax Mine, Kamloops, BC
LOGGED BY: MC/MK **CHECKED BY:** MAB
SHEET 4 **OF** 18 **HOLE NO.:** KAX-14-108

KCBL_OVERBURDEN_DRILLLOGS-SI 140624 AJAX OVERBURDEN_ES.GPJ KC_DATA.GDT 3/20/15

OVERBURDEN DRILLHOLE LOG KAX-14-108

STARTED: Mar 11, 2014 **FINISHED:** Mar 26, 2014
DRILL METHOD: PQ3 Coring
GROUND ELEV. (m): 901.4
COORDINATES (m): N 5609428 E 683140

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE AND NO.	SAMPLE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
41					Deep Monitoring Well: 50.8 mm (2") Schedule 80 PVC Standpipe with slotted screen. Screen 91.8 to 111.8 mbgl Filter pack 71.7 to 90 mbgl Shallow monitoring well installed in an offset hole. Negligible changes in lithology over the short offset distance were recorded.	
42						
43						
44						
45						
46						
47						
48						
49						
50						

Su - kPa
25 75 125 175 225
◆ UC/2 ▲ P.PEN/2
WATER1 ▽ WATER2 ▼ WATER3 ▼
★ % FINES ■ SPT N ◘ LPT N
W_P% W% W_L%
× – – – – ▲ – – – – ×
20 40 60 80

Klohn Crippen Berger

PROJECT NO.: M09871A01
PROJECT: Ajax Mine Groundwater Study
LOCATION: Ajax Mine, Kamloops, BC
LOGGED BY: MC/MK **CHECKED BY: MAB**
SHEET 5 **OF** 18 **HOLE NO.:** KAX-14-108

KCBL_OVERBURDEN_DRILLLOGS-SI 140624 AJAX OVERBURDEN_ES.GPJ KC_DATA.GDT 3/20/15

OVERBURDEN DRILLHOLE LOG KAX-14-114

STARTED: Mar 26, 2014 **FINISHED:** April 7, 2014
DRILL METHOD: HQ3 Coring
GROUND ELEV. (m): 895.5
COORDINATES (m): N 5609277 E 683210

Su - kPa: 25 75 125 175 225 | UC/2 P.PEN/2 | WATER1 WATER2 WATER3 | % FINES SPT N LPT N | W_P% W% W_L% | 20 40 60 80

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE AND NO.	SAMPLE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
0		Run 1	14%		0.1 895.4 ORGANIC SILT (OL), sandy, low plasticity, stiff (frozen), dark brown, dry to moist, homogeneous, some rootlets, (Topsoil)	
					SAND (SM), fine to medium grained, some silt, some gravel, trace cobbles, well graded, loose, max. particle size 70 mm, subrounded, brown, dry, homogeneous (GLACIAL TILL)	
1						
2		Run 2	210%		2.0 893.5	
	15 18 22	SPT-KAX-14 -114-2.0	36%		SAND (SM), fine to coarse grained, gravely, some silt, well graded, compact, max. particle size of 30 mm, angular to subangular, brown, moist to wet, homogeneous (GLACIAL TILL)	
			16%		2.3 893.2	
		Run 4	27%		SAND (SM), fine to coarse grained, silty, some gravel, trace cobbles, well graded, compact, max particle size 75 mm, angular to subangular, brown, moist to wet, homogeneous (GLACIAL TILL)	
3		Run 3				
					3.5	
	8 11 21	SPT-KAX-14 -114-3.5	38%		892.0 SAND (SM), fine to coarse grained, silty, some gravel, well graded, compact, max. particle size 30 mm, angular to subangular, greyish brown, moist to wet, homogeneous (GLACIAL TILL)	
4			0%			
		Run 5				
					5.0	
5	26 >50	SPT-KAX-14 -114-5.0	54%		890.5 SAND AND GRAVEL (SW), fine to coarse grained, well graded, dense to very dense, max particle size 20 mm, angular, grey to dark grey, wet, homogeneous	
			23%			
6		Run 6				
					6.5	
		Run 7	200%		889.0 GRAVEL (GP), fine to coarse grained, some cobbles, poorly graded, max particle size 80 mm, subangular to subrounded, grey, wet, homogeneous	
	16 19 18	SPT-KAX-14 -114-6.62	0%			
7			0%			
		Run 8				
					8.0	
8	6 21 44	SPT-KAX-14 -114-8.0	10%		887.5 SAND (SW), medium to coarse grained, gravely (fine grained), well graded, loose to compact, max particle size 10 mm, subangular to subrounded, dark grey, wet homogeneous	
					8.5 887.1	
		Run 9			SAND AND GRAVEL (SM), fine to coarse grained, some cobbles, well graded, loose to compact, max particle size 80 mm, subangular to subrounded, brown, moist to wet, homogeneous	
9						
					9.5	
	17 24 20	SPT-KAX-14 -114	75%		886.0 CLAY (CH), sandy, some gravel, high plasticity, firm, grey, moist, homogeneous, no dilatancy (GLACIAL TILL)	
10					Continued Next Page	

Klohn Crippen Berger

PROJECT NO.: M09871A01
PROJECT: Ajax Mine Groundwater Study
LOCATION: Ajax Mine, Kamloops, BC
LOGGED BY: MK/LR/MC **CHECKED BY:** MAB
SHEET 1 **OF** 18 **HOLE NO.:** KAX-14-114

KCBL_OVERBURDEN_DRILLLOGS-SI 140624 AJAX OVERBURDEN_ES.GPJ KC_DATA.GDT 3/20/15

OVERBURDEN DRILLHOLE LOG KAX-14-114

STARTED: Mar 26, 2014 **FINISHED:** April 7, 2014
DRILL METHOD: HQ3 Coring
GROUND ELEV. (m): 895.5
COORDINATES (m): N 5609277 E 683210

Su - kPa: 25 75 125 175 225 — UC/2 — P.PEN/2
WATER1 WATER2 WATER3
% FINES SPT N LPT N
W_P% W% W_L%
20 40 60 80

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE AND NO.	SAMPLE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
		Run 10	19%			
11					11.0 / 884.5 SAND (SM), fine to coarse grained, gravelly (fine grained), some silt, well graded, compact to dense, max particle size 5 mm, angular to subangular, grey, wet, homogeneous (GLACIAL TILL)	
	14 19 27	SPT-KAX-14 -114-11.0	83%			
12		Run 11	46%		12.5 / 883.0 CLAY (CH), some gravel, some sand, trace cobbles, medium plasticity, firm, grey, moist, homogeneous, slow dilatancy (GLACIAL TILL) pocket pen = 2.5 kg/cm2	
	13 18 23	SPT-KAX-14 -114-12.5	48%			
13		Run 12	65%			
14	21 13 16	SPT-KAX-14 -114-14.0	108%		14.0 / 881.5 CLAY (CH), sandy, trace gravel, high plasticity, firm, grey, moist, homogeneous, no dilatancy (GLACIAL TILL) pocket pen - 2.5 - 3.0 kg/cm2	
		Run 13	0%			
15					15.5 / 880.0 CLAY (CH), some sand, some gravel (fine grained), high plasticity, firm, grey, moist, homogeneous, none to slow dilatancy (GLACIAL TILL) pocket pen = 2.0 - 2.5 kg/cm2	
	8 1	SPT-KAX-14 -114-15.50	35%			
16		Run 14	0%			
17	8 7 14	SPT-KAX-14 -114-17.00 m	0%		17.0 / 878.5 CLAY (CH), gravelly, some sand, high plasticity, firm, grey, moist, homogeneous, none to slow dilatancy (GLACIAL TILL) pocket pen = 1.75 kg/cm2	
		Run 15				
18	14 3 5	SPT-KAX-14 -108-18.50 m	0%		18.5 / 877.0 CLAY (CH), some gravel (fine), some sand (fine to coarse), high plasticity, firm, grey, moist, homogeneous, none to slow dilatancy (GLACIAL TILL) pocket pen = 1.0 kg/cm2	
19		Run 16				
	44 50 50	SPT-KAX-14 -114-19.55 m	0%		19.6 / 876.0 SILT (ML), sandy, trace clay, low plasticity, firm to very stiff, brownish grey, dry to moist, varved (GLACIAL TILL) pocket pen = 0.75 - 3.25 kg/cm2	
20					Continued Next Page	

Klohn Crippen Berger

PROJECT NO.: M09871A01
PROJECT: Ajax Mine Groundwater Study
LOCATION: Ajax Mine, Kamloops, BC
LOGGED BY: MK/LR/MC **CHECKED BY:** MAB
SHEET 2 **OF** 18 **HOLE NO.:** KAX-14-114

KCBL_OVERBURDEN_DRILLLOGS-SI 140624 AJAX OVERBURDEN_ES.GPJ KC_DATA.GDT 3/20/15

OVERBURDEN DRILLHOLE LOG KAX-14-114

STARTED: Mar 26, 2014 **FINISHED:** April 7, 2014
DRILL METHOD: HQ3 Coring
GROUND ELEV. (m): 895.5
COORDINATES (m): N 5609277 E 683210

Su - kPa: 25 75 125 175 225 — UC/2 — P.PEN/2
WATER1 WATER2 WATER3
★ % FINES ■ SPT N □ LPT N
W_P% W% W_L%
20 40 60 80

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE AND NO.	SAMPLE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
21	28 50	Run 17 / SPT-KAX-14-114-21.01 m	0%		21.0 / 874.5 SAND (SM), fine to coarse grained, gravelly, some silt, well graded, compact to very dense, max. particle size 10 mm, angular to subangular, brown, dry to moist, homogeneous (GLACIAL TILL)	
22		Run 18				
	43 50	SPT-KAX-14-114-22.64 m	0%		22.6 / 872.9 SAND (SC), fine to coarse grained, gravelly, some clay, trace silt, well graded, dense to very dense, max. particle size 5 mm, subangular to subrounded, grey, dry to moist, homogeneous (GLACIAL TILL)	
23		Run 19				
24	15 50	SPT-KAX-14-114-24.10 m	0%		24.1 / 871.4 SAND (SM), fine to coarse grained, gravelly, some silt, well graded, compact to very dense, max. particle size 20 mm, angular to subangular, brownish grey, moist, homogeneous (GLACIAL TILL)	
25		Run 20				
	15 50	SPT-KAX-14-114-25.57 m	0%		25.6 / 869.9 GRAVEL (GW), fine to coarse, trace sand, well graded, loose to compact, max. particle size 20 mm, subangular to subrounded, grey, dry, homogeneous	
26		Run 21			SAND AND GRAVEL (SM), fine to coarse grained, some silt, well graded, max. particle size 20 mm, subangular to subrounded, grey, dry to moist, homogeneous (GLACIAL TILL)	
27						
	40 50	SPT-KAX-14-114-27.18 m	85% / 0%		27.2 / 868.4 SAND (SM), fine to coarse grained, gravelly, some silt, well graded, dense to very dense, max particle size 20 mm, angular to subangular, grey, moist, homogeneous (GLACIAL TILL)	
28		Run 22				
29	50/5"	SPT-KAX-14-114-28.71	60% / 0%		28.7 / 866.8 SAND AND GRAVEL (SM), fine to coarse grained, some silt, well graded, very dense, max particle size 10 mm, subangular to subrounded, grey, moist, homogeneous (GLACIAL TILL)	
		Run 23				
30					Continued Next Page	

Klohn Crippen Berger

PROJECT NO.: M09871A01
PROJECT: Ajax Mine Groundwater Study
LOCATION: Ajax Mine, Kamloops, BC
LOGGED BY: MK/LR/MC **CHECKED BY:** MAB
SHEET 3 **OF** 18 **HOLE NO.:** KAX-14-114

KCBL_OVERBURDEN_DRILLLOGS-SI 140624 AJAX OVERBURDEN_ES.GPJ KC_DATA.GDT 3/20/15

OVERBURDEN DRILLHOLE LOG KAX-14-114

STARTED: Mar 26, 2014 **FINISHED:** April 7, 2014
DRILL METHOD: HQ3 Coring
GROUND ELEV. (m): 895.5
COORDINATES (m): N 5609277 E 683210

Su - kPa: 25 75 125 175 225 | UC/2 P.PEN/2 | WATER1 WATER2 WATER3 | % FINES SPT N LPT N | W_P% W% W_L% | 20 40 60 80

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE AND NO.	SAMPLE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
30	50/5"	SPT-KAX-14 -114-30.25	0% 0%		30.2 / 865.3 SAND (SM), fine to coarse grained, silty, some gravel, well graded max particle size 10 mm, angular to subangular, grey, homogeneous (GLACIAL TILL)	
31		Run 24				
	50/4"	SPT-KAX-14 -114-31.70	0% 0%		31.7 / 863.8 SAND (SM), fine to coarse grained, gravelly, well graded, max particle size 15 mm, subangular to subrounded, grey, moist, homogeneous (GLACIAL TILL)	
32		Run 25				
33	50/2.5"	SPT-KAX-14 -114-33.07	140% 0%		33.1 / 862.8 SAND (SM), fine to coarse grained, some silt, some gravel (fine), well graded, max particle size 20 mm, subrounded, grey, moist, homogeneous; 862.3 SILT (ML), trace sand, medium plasticity, stiff, grey, moist, homogeneous	
34		Run 26			SAND AND GRAVEL (SM), fine to coarse grained, well graded, max particle size 20 mm, angular, grey, moist, homogeneous (WEATHERED BEDROCK)	
	50	SPT-KAX-14 -114-34.60	0%			
35		Run 27				
36	>50	SPT-KAX-14 -114-36.06	0%			
37		Run 28				
	>50	SPT-KAX-14 -114-37.57			37.6 / 858.0 End of Overburden Drill Log at 38.0 m. See Rock Log.	
38					Shallow Monitoring Well: 50.8 mm (2") Schedule 80 PVC Standpipe with slotted screen.	
39						
40					Continued Next Page	

Klohn Crippen Berger

PROJECT NO.: M09871A01
PROJECT: Ajax Mine Groundwater Study
LOCATION: Ajax Mine, Kamloops, BC
LOGGED BY: MK/LR/MC **CHECKED BY:** MAB
SHEET 4 **OF** 18 **HOLE NO.:** KAX-14-114

KCBL_OVERBURDEN_DRILLLOGS-SI 140624 AJAX OVERBURDEN_ES.GPJ KC_DATA.GDT 3/20/15

OVERBURDEN DRILLHOLE LOG KAX-14-114

STARTED: Mar 26, 2014 **FINISHED:** April 7, 2014
DRILL METHOD: HQ3 Coring
GROUND ELEV. (m): 895.5
COORDINATES (m): N 5609277 E 683210

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE AND NO.	SAMPLE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
41					Screen 19.8 to 32.9 mbgl Filter pack 22.0 to 31.1 mbgl Deep Monitoring Well: 50.8 mm (2") Schedule 80 PVC Standpipe with slotted screen. Screen 98.3 to 124 mbgl Filter pack 104.4 to 122.7 mbgl Deep monitoring well installed in an offset hole. Negligible changes in lithology over the short offset distance were recorded.	
42						
43						
44						
45						
46						
47						
48						
49						
50						

Su - kPa
25 75 125 175 225
◆ UC/2 ▲ P.PEN/2
WATER1 ▽ WATER2 ▼ WATER3 ▼
★ % FINES ■ SPT N ◘ LPT N
W_P% W% W_L%
× – – – – ▲ – – – – ×
20 40 60 80

Klohn Crippen Berger

PROJECT NO.: M09871A01
PROJECT: Ajax Mine Groundwater Study
LOCATION: Ajax Mine, Kamloops, BC
LOGGED BY: MK/LR/MC **CHECKED BY: MAB**
SHEET 5 **OF** 18 **HOLE NO.:** KAX-14-114

KCBL_OVERBURDEN_DRILLLOGS-SI 140624 AJAX OVERBURDEN_ES.GPJ KC_DATA.GDT 3/20/15

OVERBURDEN DRILLHOLE LOG KAX-14-121

STARTED: April 7, 2014 **FINISHED:** April 14, 2014
DRILL METHOD: A5
GROUND ELEV. (m): 909.3
COORDINATES (m): N 5609655 E 683236

Su - kPa: 25 75 125 175 225
UC/2 P.PEN/2
WATER1 WATER2 WATER3
% FINES SPT N LPT N
W_P% W% W_L%
20 40 60 80

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE AND NO.	SAMPLE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT	DETAILS
					COBBLES with clay		
					2.4 / 906.9 Washed COBBLES		
					3.9 / 905.4 SILT (MH), some sand, trace gravel, high plasticity, soft, grey, moist to wet, homogeneous (GLACIAL TILL)		
					5.4 / 903.9 SILT (MH) and gravel, sandy, medium plasticity, stiff to very stiff, light brown, moist, homogeneous (GLACIAL TILL)		
					6.9 / 902.4 SAND and GRAVEL (GW), fine to coarse, silty, some cobbles, well graded, maximum particle size 60 mm, subrounded, brown, moist to wet, homogeneous (GLACIAL TILL)		
					8.4 / 900.9 SAND and GRAVEL (GW), fine to coarse, silty, some cobbles, well graded, maximum particle size 60 mm, subrounded, brown, moist to wet, homogeneous (GLACIAL TILL)		
					9.4 / 899.9 GRAVEL (GP), coarse, poorly graded, maximum particle size 60 mm, subrounded to subangular, grey		
					9.9 Continued Next Page		

Klohn Crippen Berger

PROJECT NO.: M09871A01
PROJECT: Ajax Mine Groundwater Study
LOCATION: Ajax Mine, Kamloops, BC
LOGGED BY: MC/LR **CHECKED BY:** MAB
SHEET 1 **OF** 17 **HOLE NO.:** KAX-14-121

KCBL_OVERBURDEN_DRILLLOGS-SI 140624 AJAX OVERBURDEN_ES.GPJ KC_DATA.GDT 3/20/15

OVERBURDEN DRILLHOLE LOG KAX-14-121

STARTED: April 7, 2014 **FINISHED:** April 14, 2014

DRILL METHOD: A5

GROUND ELEV. (m): 909.3

COORDINATES (m): N 5609655 E 683236

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE AND NO.	SAMPLE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT	DETAILS
					909.4 GRAVEL (GP), coarse, poorly graded, maximum particle size 60 mm, subrounded to subangular, grey		
					10.2 899.1		
					End of Overburden Drill Log at 10.2 m. See Rock Log.		
					Monitoring Well Installation 50.8 mm (2") Schedule 80 PVC Standpipe with slotted screen. Screen 141.9 to 150.9 mbgl Filter pack 144.1 to 150.2 mbgl		
					SPT samples not collected with A5 rig.		

Su - kPa

25 75 125 175 225

◆ UC/2 ▲ P.PEN/2

WATER1 ▽ WATER2 ▼ WATER3 ▼

★ % FINES ■ SPT N ◘ LPT N

W_P% W% W_L%

× – – – – ▲ – – – – ×

20 40 60 80

11 12 13 14 15 16 17 18 19 20

Klohn Crippen Berger

PROJECT NO.: M09871A01

PROJECT: Ajax Mine Groundwater Study

LOCATION: Ajax Mine, Kamloops, BC

LOGGED BY: MC/LR **CHECKED BY: MAB**

SHEET 2 **OF** 17 **HOLE NO.:** KAX-14-121

KCBL_OVERBURDEN_DRILLLOGS-SI 140624 AJAX OVERBURDEN_ES.GPJ KC_DATA.GDT 3/20/15

OVERBURDEN DRILLHOLE LOG KAX-14-124

STARTED: April 14, 2014 **FINISHED:** April 26, 2014
DRILL METHOD: A5
GROUND ELEV. (m): 903.7
COORDINATES (m): N 5609491 E 683316

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE AND NO.	SAMPLE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
0					No Recovery	
10					Continued Next Page	

Su - kPa
25 75 125 175 225
◆ UC/2 ▲ P.PEN/2
WATER1 ▽ WATER2 ▼ WATER3 ▼
★ % FINES ■ SPT N ◘ LPT N
W_P% W% W_L%
× – – – – ▲ – – – – ×
20 40 60 80

PROJECT NO.: M09871A01
PROJECT: Ajax Mine Groundwater Study
LOCATION: Ajax Mine, Kamloops, BC
LOGGED BY: MC/MS **CHECKED BY: MAB**
SHEET 1 **OF** 21 **HOLE NO.:** KAX-14-124

Klohn Crippen Berger

KCBL_OVERBURDEN_DRILLLOGS-SI 140624 AJAX OVERBURDEN_ES.GPJ KC_DATA.GDT 3/20/15

OVERBURDEN DRILLHOLE LOG KAX-14-124

STARTED: April 14, 2014 **FINISHED:** April 26, 2014
DRILL METHOD: A5
GROUND ELEV. (m): 903.7
COORDINATES (m): N 5609491 E 683316

Su - kPa: 25 75 125 175 225 — UC/2 — P.PEN/2
WATER1 WATER2 WATER3
% FINES SPT N LPT N
W_P% W% W_L%
20 40 60 80

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE AND NO.	SAMPLE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
16		Run 7	45%		16.0 / 887.7 Cobbles and gravel, subrounded	
17						
18		Run 8	7%			
19		Run 9	27%		19.0 / 884.7 Cobbles and gravel, subrounded	
20					Continued Next Page	

Klohn Crippen Berger

PROJECT NO.: M09871A01
PROJECT: Ajax Mine Groundwater Study
LOCATION: Ajax Mine, Kamloops, BC
LOGGED BY: MC/MS **CHECKED BY: MAB**
SHEET 2 **OF** 21 **HOLE NO.:** KAX-14-124

KCBL_OVERBURDEN_DRILLLOGS-SI 140624 AJAX OVERBURDEN_ES.GPJ KC_DATA.GDT 3/20/15

OVERBURDEN DRILLHOLE LOG KAX-14-124

STARTED: April 14, 2014 **FINISHED:** April 26, 2014
DRILL METHOD: A5
GROUND ELEV. (m): 903.7
COORDINATES (m): N 5609491 E 683316

Su - kPa: 25 75 125 175 225
UC/2 P.PEN/2
WATER1 WATER2 WATER3
% FINES SPT N LPT N
W_P% W% W_L%
20 40 60 80

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE AND NO.	SAMPLE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
21		Run 10	26%		20.5 / 883.2 Cobbles and gravel, subangular, transition to bedrock, iron oxidation staining present	
22					22.0 / 881.7	
23					End of Overburden Drill Log at 22.0 m. See Rock Log.	
24					Shallow Vibrating Wire Piezometer installed at 50.4 m; Deep Vibrating Wire Piezometer installed at 190.4 m.	
25					SPT samples not collected with A5 rig.	
26						
27						
28						
29						
30						

Klohn Crippen Berger

PROJECT NO.: M09871A01
PROJECT: Ajax Mine Groundwater Study
LOCATION: Ajax Mine, Kamloops, BC
LOGGED BY: MC/MS **CHECKED BY: MAB**
SHEET 3 **OF** 21 **HOLE NO.:** KAX-14-124

KCBL_OVERBURDEN_DRILLLOGS-SI 140624 AJAX OVERBURDEN_ES.GPJ KC_DATA.GDT 3/20/15

OVERBURDEN DRILLHOLE LOG KAX-14-128

STARTED: April 18, 2014 **FINISHED:** April 30, 2014
DRILL METHOD: ODEX
GROUND ELEV. (m): 904.3
COORDINATES (m): N 5609497 E 683325

Su - kPa: 25 75 125 175 225 | UC/2 P.PEN/2 | WATER1 WATER2 WATER3 | % FINES SPT N LPT N | W_P% W% W_L% | 20 40 60 80

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE AND NO.	SAMPLE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
			-100%		SAND (SM), fine to coarse grained, fine gravel, trace silt, maximum 9.5 mm, subangular, trace flat, fines is non to low plasticity, rapid dilatancy, grey, dry to moist, loose	
1.5					902.8	
	22 23 20	SPT-KAX-14 -128-1.52 m	87%		GRAVEL (GM), fine to coarse grained, silty, sandy, well graded, compact, dry, subangular, brown to grey, homogeneous (GLACIAL TILL) At 1.98 m: Slight increase in fine fraction	
3.0					901.2	
	7 5 6	SPT-KAX-14 -128-3.04 m	39%		SAND (SM), silty, some fine gravel, trace coarse sand, some organics, fines are non plastic to low plasticity, dark brown, dry to moist	
	4 5 11	SPT-KAX-14 -128-4.57 m				
	30/6.5	SPT-KAX-14 -128-6.10 m	56%			
7.6					896.7	
	14 26 45	SPT-KAX-14 -128-7.62 m	100%		SAND AND SILT (SM), fine grained, some clay, poorly graded, compact to dense, brown, moist, interbedded, silt is low plasticity and stiff (GLACIAL LACUSTRINE TILL)	
8.1					896.2	
					SAND (SM), some fine gravel, coarse to fine sand and silt, low plasticity, very soft, low toughness, wet, light brown	
9.1					895.1	
	8 16 18	SPT-KAX-14 -128-9.14 m	100%		9.14 m: Becomes clayey, laminated with 5 mm beds of clay (GLACIAL LACUSTRINE TILL).	

Continued Next Page

Klohn Crippen Berger

PROJECT NO.: M09871A01
PROJECT: Ajax Mine Groundwater Study
LOCATION: Ajax Mine, Kamloops, BC
LOGGED BY: LB/JC/BY **CHECKED BY: MAB**
SHEET 1 **OF** 24 **HOLE NO.:** KAX-14-128

KCBL_OVERBURDEN_DRILLLOGS-SI 140624 AJAX OVERBURDEN_ES.GPJ KC_DATA.GDT 3/20/15

OVERBURDEN DRILLHOLE LOG KAX-14-128

STARTED: April 18, 2014 **FINISHED:** April 30, 2014
DRILL METHOD: ODEX
GROUND ELEV. (m): 904.3
COORDINATES (m): N 5609497 E 683325

Su - kPa: 25 75 125 175 225 — UC/2 — P.PEN/2
WATER1 WATER2 WATER3
% FINES SPT N LPT N
W_P% W% W_L%
20 40 60 80

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE AND NO.	SAMPLE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
11	5 15 30	SPT-KAX-14 -128-10.67 m	100%		SILT AND CLAY (ML), sandy, low plasticity, stiff, brown, moist, varved at 3 mm, no dilatancy (GLACIAL LACUSTRINE TILL)	
					11.1 / 893.2 SAND, fine grained, gravelly, coarse to fine sand, silty, low plasticity fines, light brown, wet, rapid dilatancy, soft, maximum 9.5 mm.	
12					12.2 / 892.1	
	19 37 38	SPT-KAX-14 -128-12.19 m	87%		12.4 / 891.9 SILT AND CLAY, sandy, low plasticity, stiff, brown, moist, varved at 3 mm, no dilatancy (GLACIAL LACUSTRINE TILL)	
13					12.7 / 891.6 SILT AND CLAY, as above, red tinge, very stiff, trace gravel. SAND (SM), fine grained, gravelly, coarse to fine sand, some silt, maximum 9.5 mm, fines are low plasticity silt, soft, wet, light brown.	
	15 64 12/1	SPT-KAX-14 -128-13.72 m	70%		13.7 / 890.6 SAND (SM), silty sand / sandy silt, trace fine gravel, maximum 9.5 mm, coarse to fine sand, silty, low plasticity, firm, light brown, moist, rapid dilatancy	
14					14.4 / 889.9	
	38 50/4	SPT-KAX-14 -128-14.40 m	80%		SANDY SILT (ML), trace gravel, some sand, maximum 19 mm, low plasticity, firm, brown, moist, slow to rapid dilatancy	
15					15.2 / 889.0 GRAVEL (GP), fine gravel and sand, trace silt, subrounded to subangular, maximum 9.5 mm, dark brownish grey, moist	
16						
					16.8 / 887.5	
17	30/4.5 - -	SPT-KAX-14 -128-16.76 m			GRAVEL (SP), fine to coarse grained, maximum 25 mm, trace sand, trace fines.	
18					18.3 / 886.0	
	23/ 1/2	SPT-KAX-14 -128-18.29 m			End of Overburden Drill Log at 18.3 m. See Rock Log.	
19						
20					Shallow Monitoring Well	

Continued Next Page

Klohn Crippen Berger

PROJECT NO.: M09871A01
PROJECT: Ajax Mine Groundwater Study
LOCATION: Ajax Mine, Kamloops, BC
LOGGED BY: LB/JC/BY **CHECKED BY: MAB**
SHEET 2 **OF** 24 **HOLE NO.:** KAX-14-128

KCBL_OVERBURDEN_DRILLLOGS-SI 140624 AJAX OVERBURDEN_ES.GPJ KC_DATA.GDT 3/20/15

OVERBURDEN DRILLHOLE LOG KAX-14-128

STARTED: April 18, 2014 **FINISHED:** April 30, 2014
DRILL METHOD: ODEX
GROUND ELEV. (m): 904.3
COORDINATES (m): N 5609497 E 683325

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE AND NO.	SAMPLE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
21					50.8 mm (2") Schedule 80 PVC Standpipe with slotted screen. Screen 9.7 to 18.0 mbgl Filter pack 10.9 to 17.0 mbgl Deep Monitoring Well: 50.8 mm (2") Schedule 80 PVC Standpipe with slotted screen. Screen 70.1 to 90.5 mbgl Filter pack 71.7 to 90 mbgl Shallow monitoring well installed in an offset hole. Negligible changes in lithology over the short offset distance have been assumed. Van Ruth plug installed at 93.70 m.	
22						
23						
24						
25						
26						
27						
28						
29						
30						

Su - kPa
25 75 125 175 225
◆ UC/2 ▲ P.PEN/2
WATER1 ▽ WATER2 ▼ WATER3 ▼
★ % FINES ■ SPT N ◘ LPT N
W_P% W% W_L%
× – – – – ▲ – – – – ×
20 40 60 80

KCBL_OVERBURDEN_DRILLLOGS-SI 140624 AJAX OVERBURDEN_ES.GPJ KC_DATA.GDT 3/20/15

Klohn Crippen Berger

PROJECT NO.: M09871A01
PROJECT: Ajax Mine Groundwater Study
LOCATION: Ajax Mine, Kamloops, BC
LOGGED BY: LB/JC/BY **CHECKED BY: MAB**
SHEET 3 **OF** 24 **HOLE NO.:** KAX-14-128

APPENDIX II

Photographs

Appendix II
Photographs

KAX-14-107

Photo II-1 KAX-14-107 SPT-KAX-14-107-0.0 m

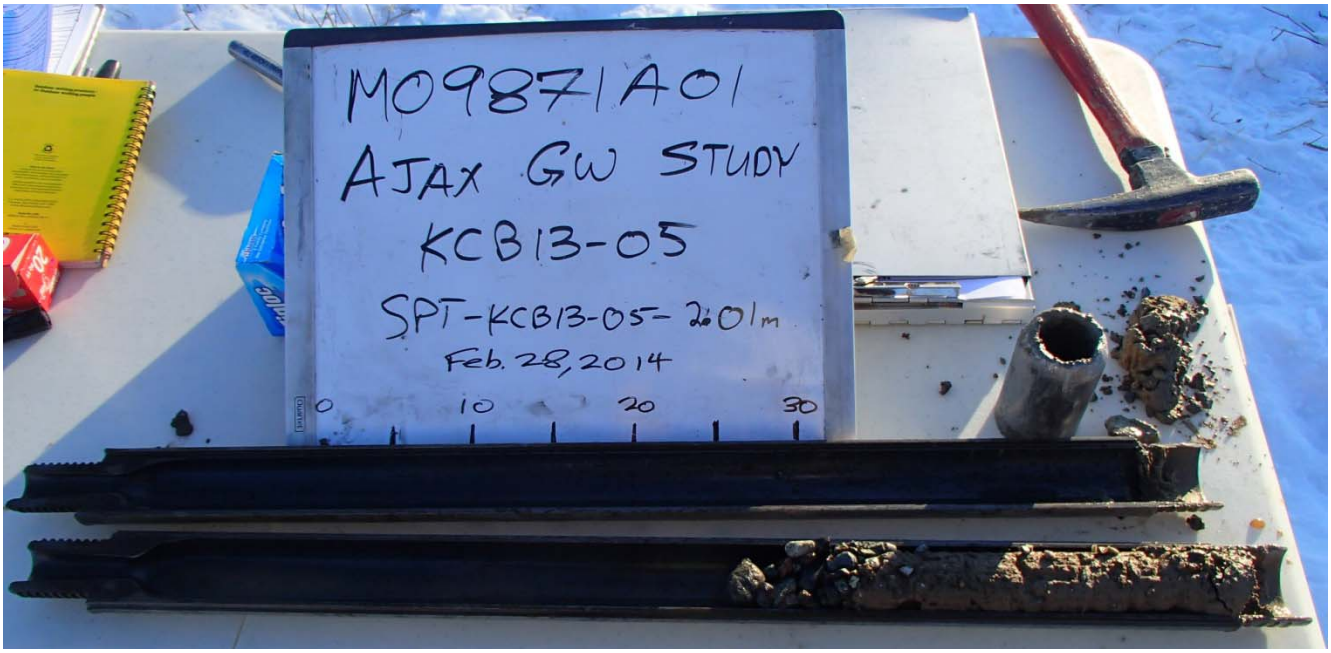


Photo II-2 KAX-14-107 SPT-KAX-14-107-2.0 m

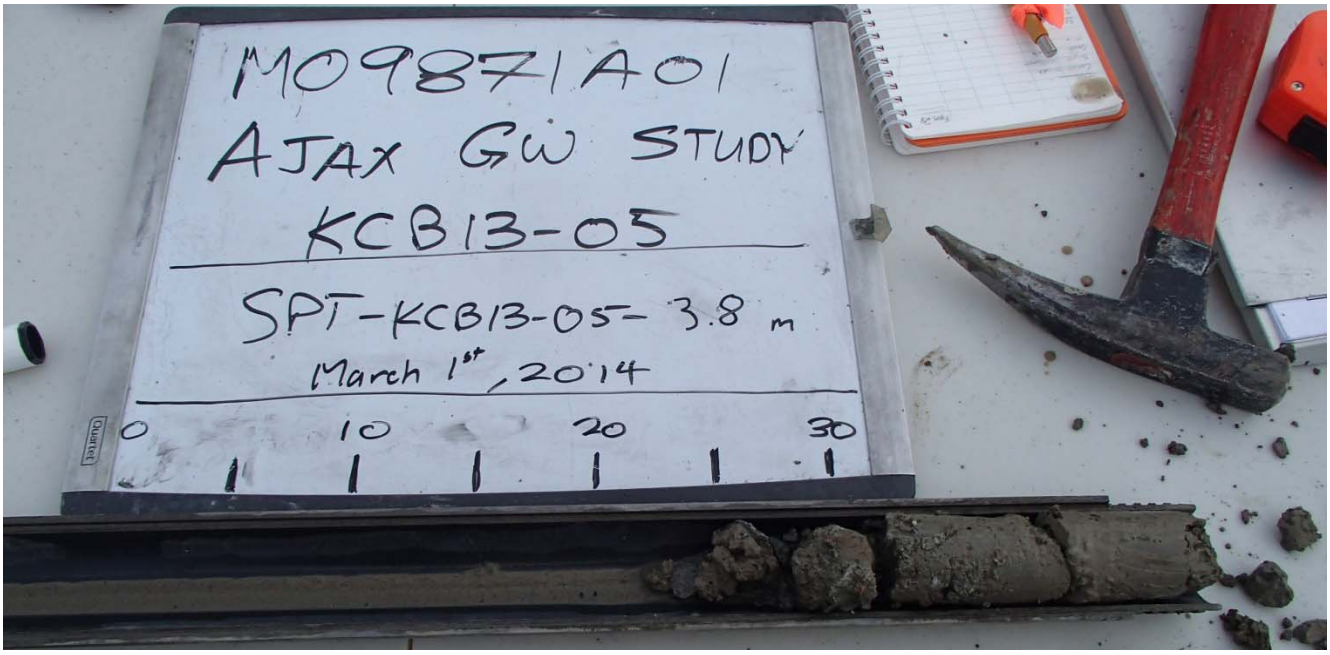


Photo II-3 KAX-14-107 SPT-KAX-14-107-3.8 m

Photo II-4 KAX-14-107 SPT-KAX-14-107-5.4 m

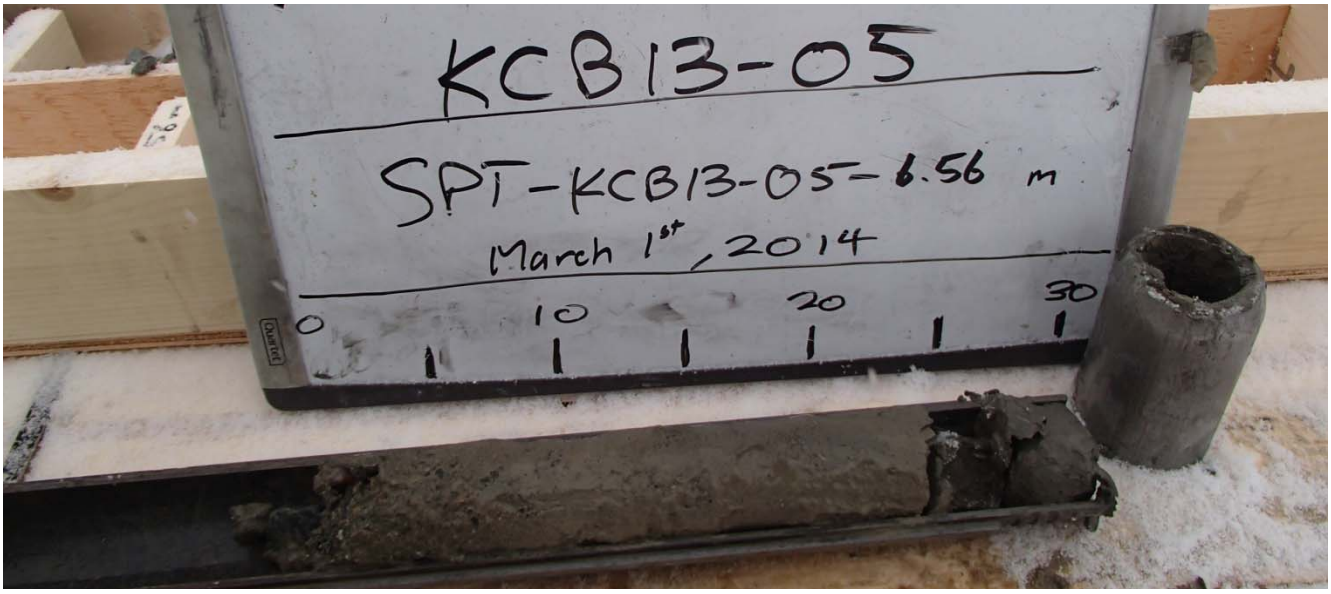


Photo II-5 KAX-14-107 SPT-KAX-14-107-6.6 m

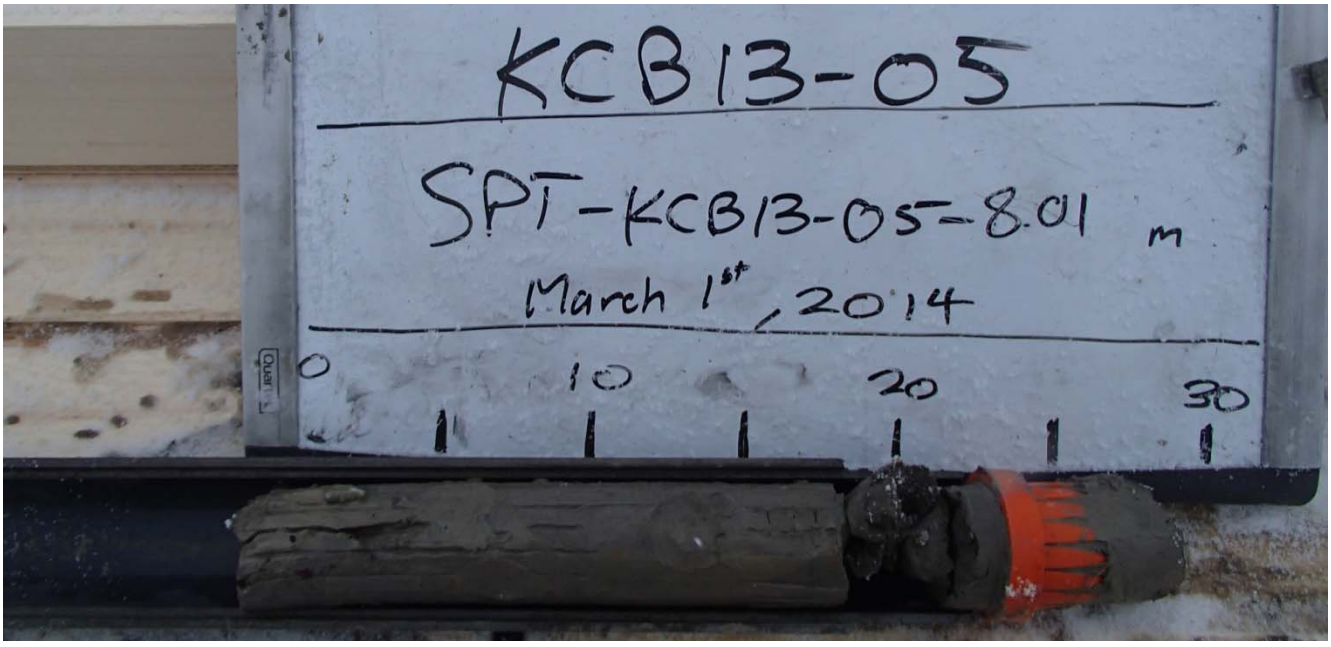


Photo II-6 KAX-14-107 SPT-KAX-14-107-8.0 m

Photo II-7 KAX-14-107 SPT-KAX-14-107-9.6 m

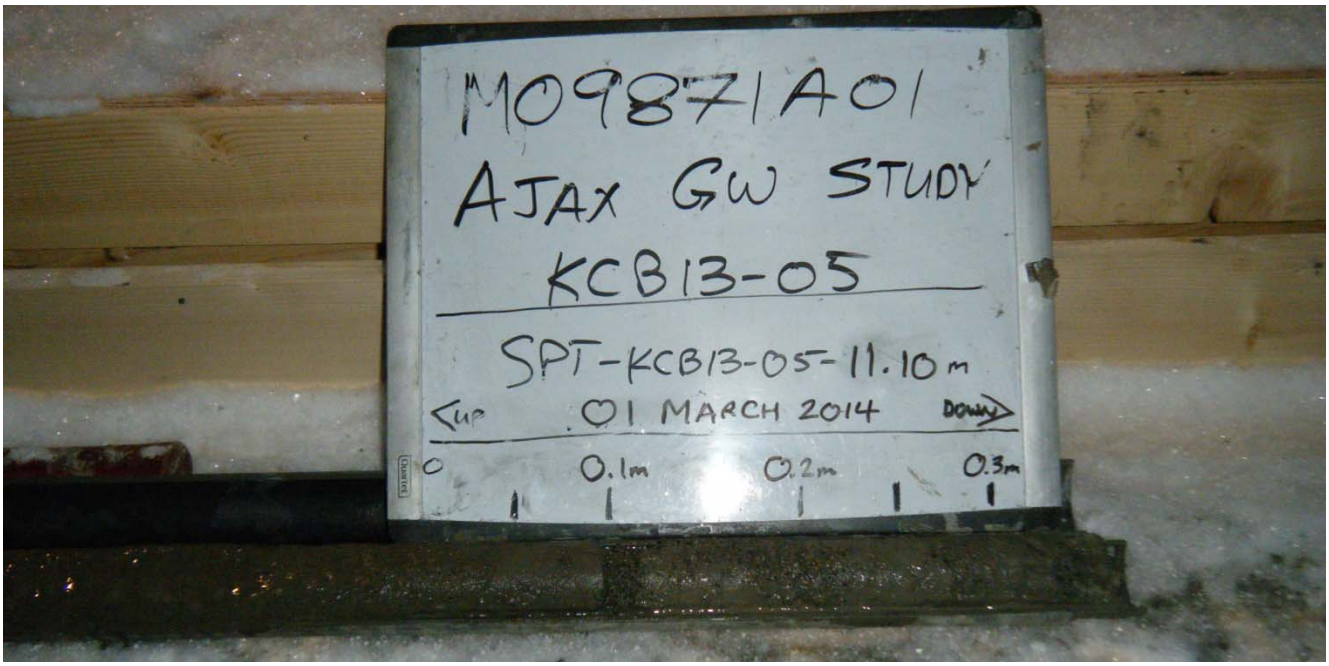


Photo II-8 KAX-14-107 SPT-KAX-14-107-11.1 m

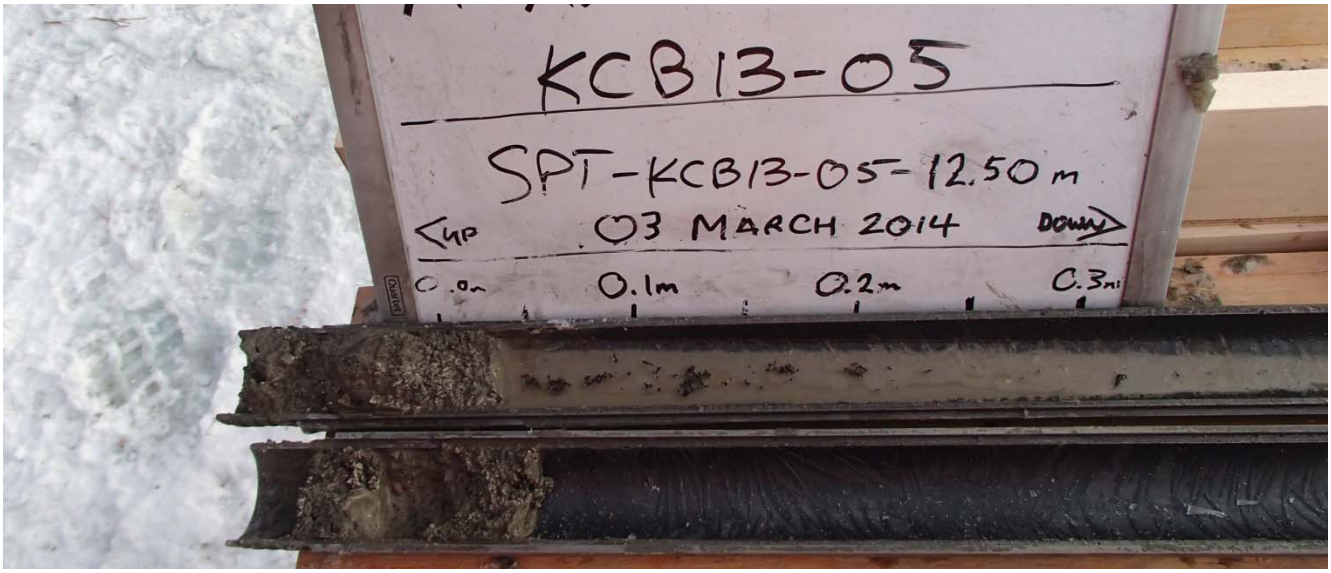


Photo II-9 KAX-14-107 SPT-KAX-14-107-12.5 m

Photo II-10 KAX-14-107 SPT-KAX-14-107-14.0 m

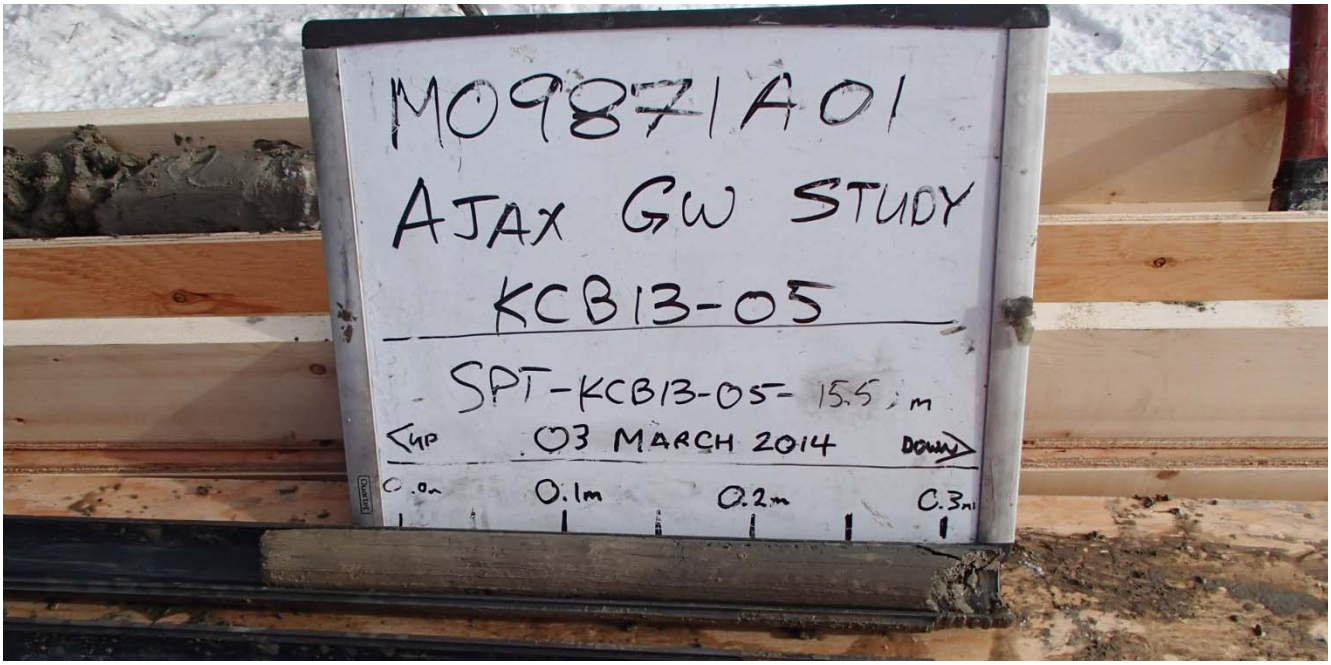


Photo II-11 KAX-14-107 SPT-KAX-14-107-15.5 m

Photo II-12 KAX-14-107 SPT-KAX-14-107-17.0 m

Photo II-13 KAX-14-107 SPT-KAX-14-107-18.5 m

Photo II-14 KAX-14-107 SPT-KAX-14-107-20.0 m

No SPTs at 21.5 m and 23.0 m because of high cobble content

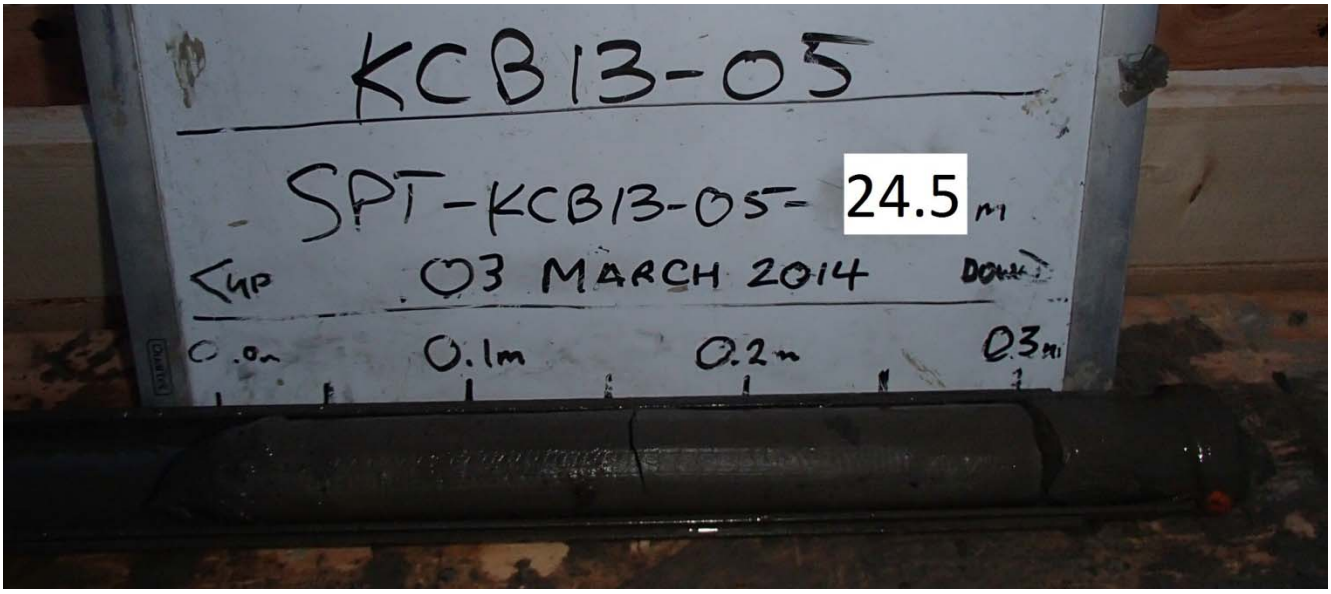


Photo II-15 KAX-14-107 SPT-KAX-14-107-24.5 m

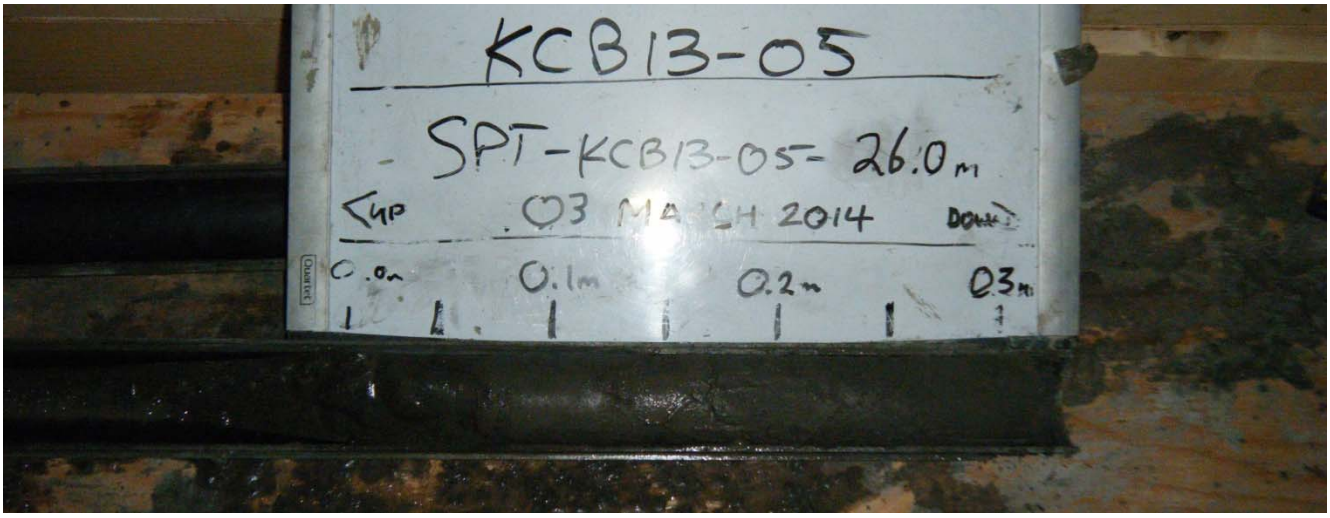


Photo II-16 KAX-14-107 SPT-KAX-14-107-26.0 m

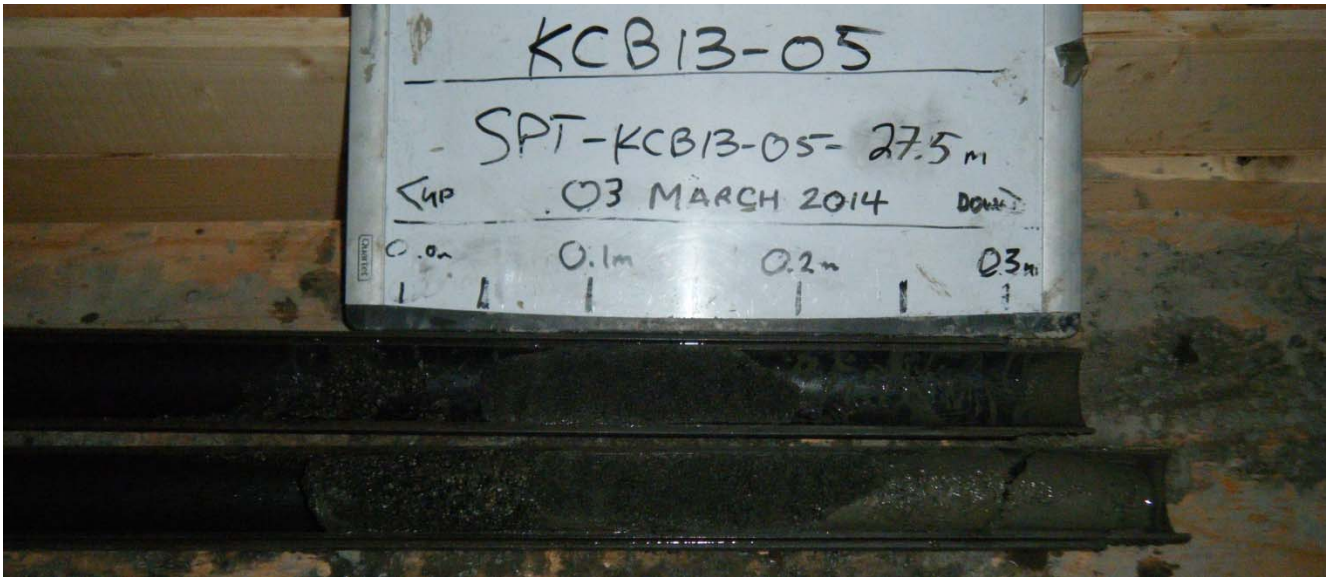


Photo II-17 KAX-14-107 SPT-KAX-14-107-27.5 m

No photos of SPTs at 29.0 m and 30.5 m

Photo II-18 KAX-14-107 SPT-KAX-14-107-32.0 m

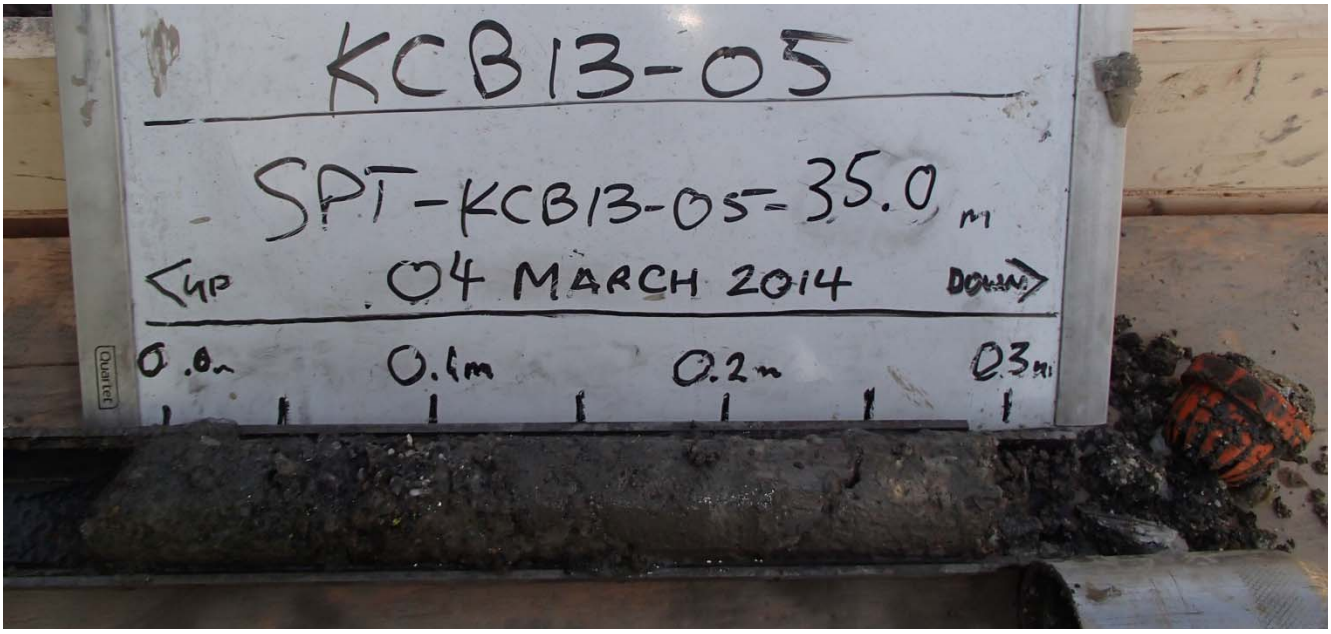


Photo II-19 KAX-14-107 SPT-KAX-14-107-35.0 m

Photo II-20 KAX-14-107 SPT-KAX-14-107-36.3 m

Photo II-21 KAX-14-107 Boxes 1 to 4 0.0 m to 24.2 m

Photo II-22 KAX-14-107 Boxes 5 to 8 24.2 m to 44.4 m

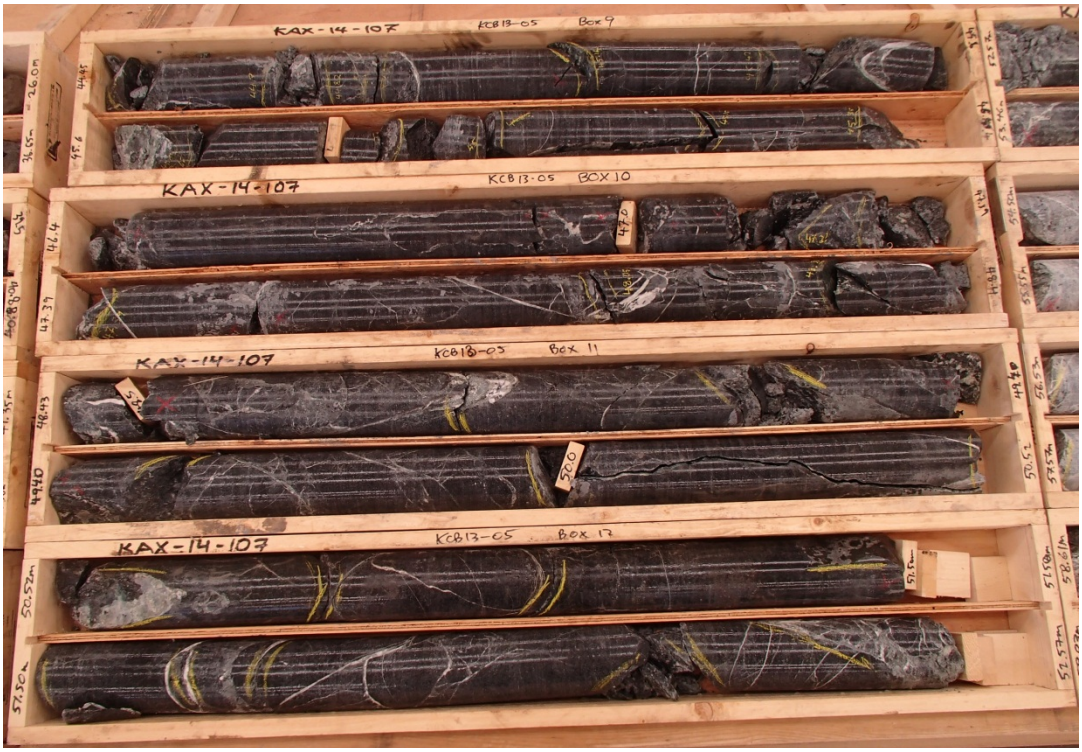


Photo II-23 KAX-14-107 Boxes 9 to 12 44.4 m to 52.6 m

Photo II-24 KAX-14-107 Boxes 13 to 16 52.6 m to 61.0 m

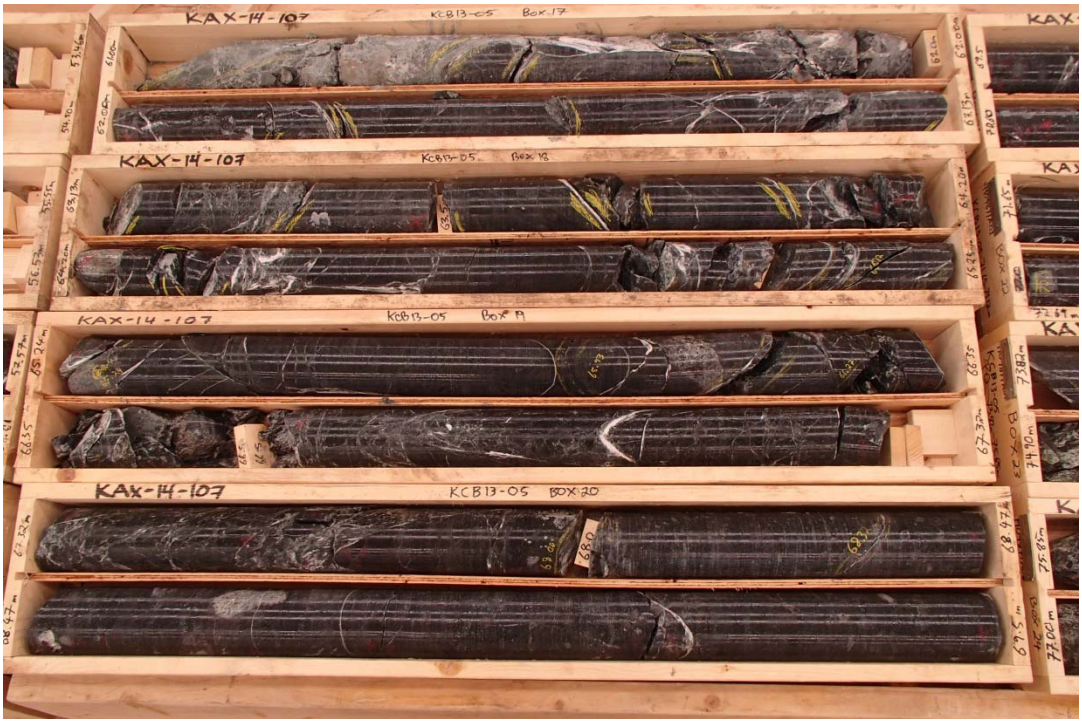


Photo II-25 KAX-14-107 Boxes 17 to 20 61.0 m to 69.5 m

Photo II-26 KAX-14-107 Boxes 21 to 24 69.5 m to 78.0 m

Photo II-27 KAX-14-107 Boxes 25 to 28 78.0 m to 84.5 m

Photo II-28 KAX-14-107 Boxes 29 to 31 84.5 m to 93.5 m

Photo II-29 KAX-14-107 Boxes 32 to 34 93.5 m to 102.5 m

Photo II-30 KAX-14-107 Boxes 35 to 37 102.5 m to 111.5 m

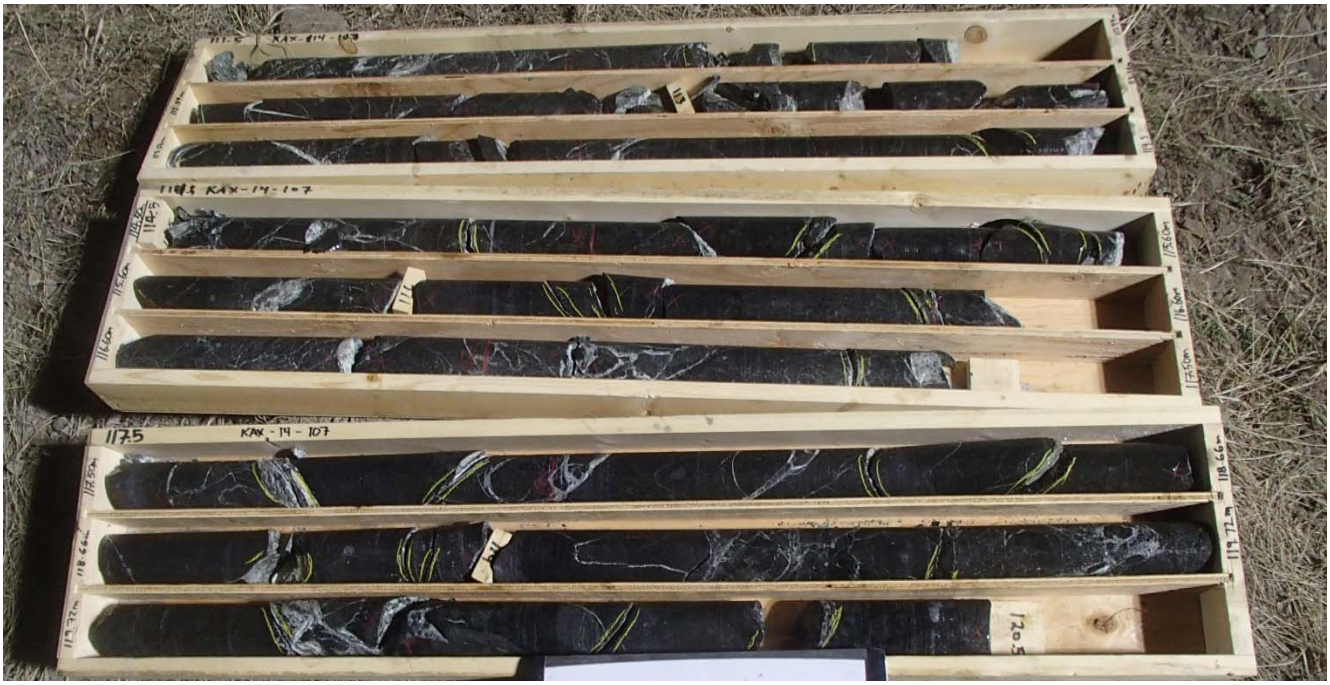


Photo II-31 KAX-14-107 Boxes 38 to 40 111.5 m to 120.5 m

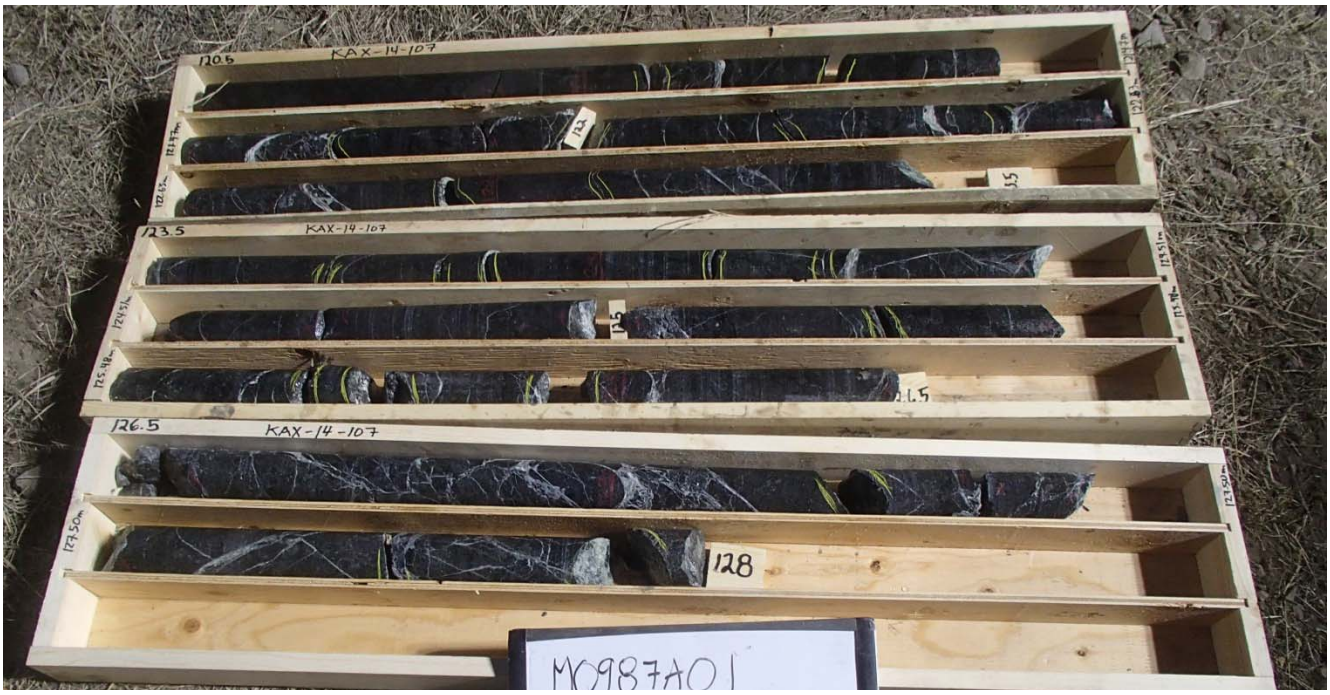


Photo II-32 KAX-14-107 Boxes 41 to 43 120.5 m to 128.0 m

KAX-14-108

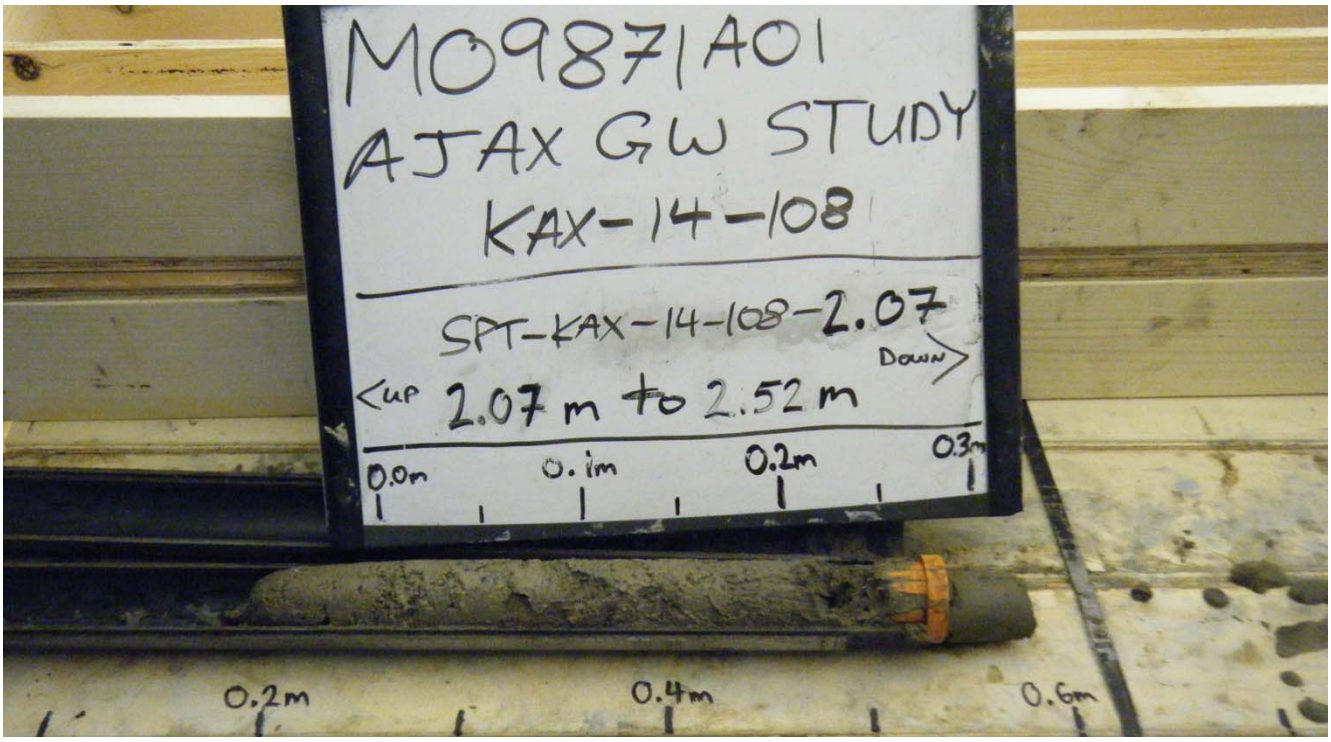


Photo II-33 KAX-14-108 SPT-KAX-14-108-2.1 m

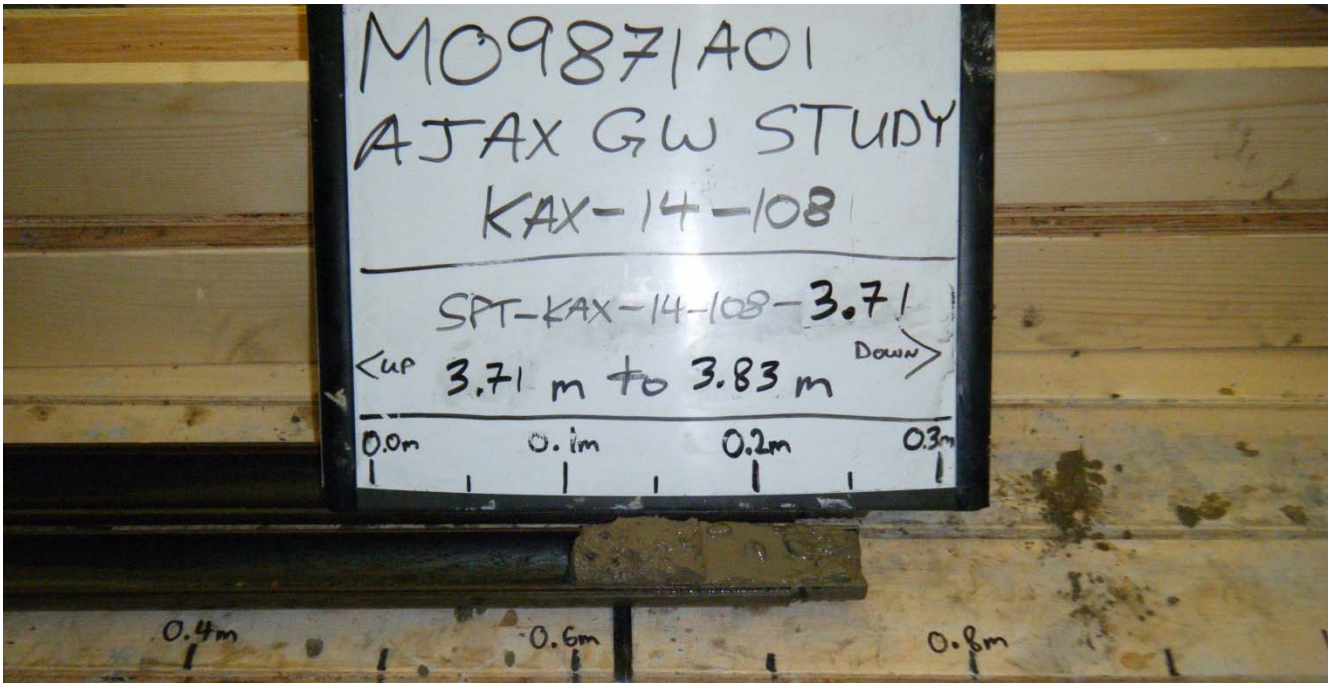


Photo II-34 KAX-14-108 SPT-KAX-14-108-3.7 m

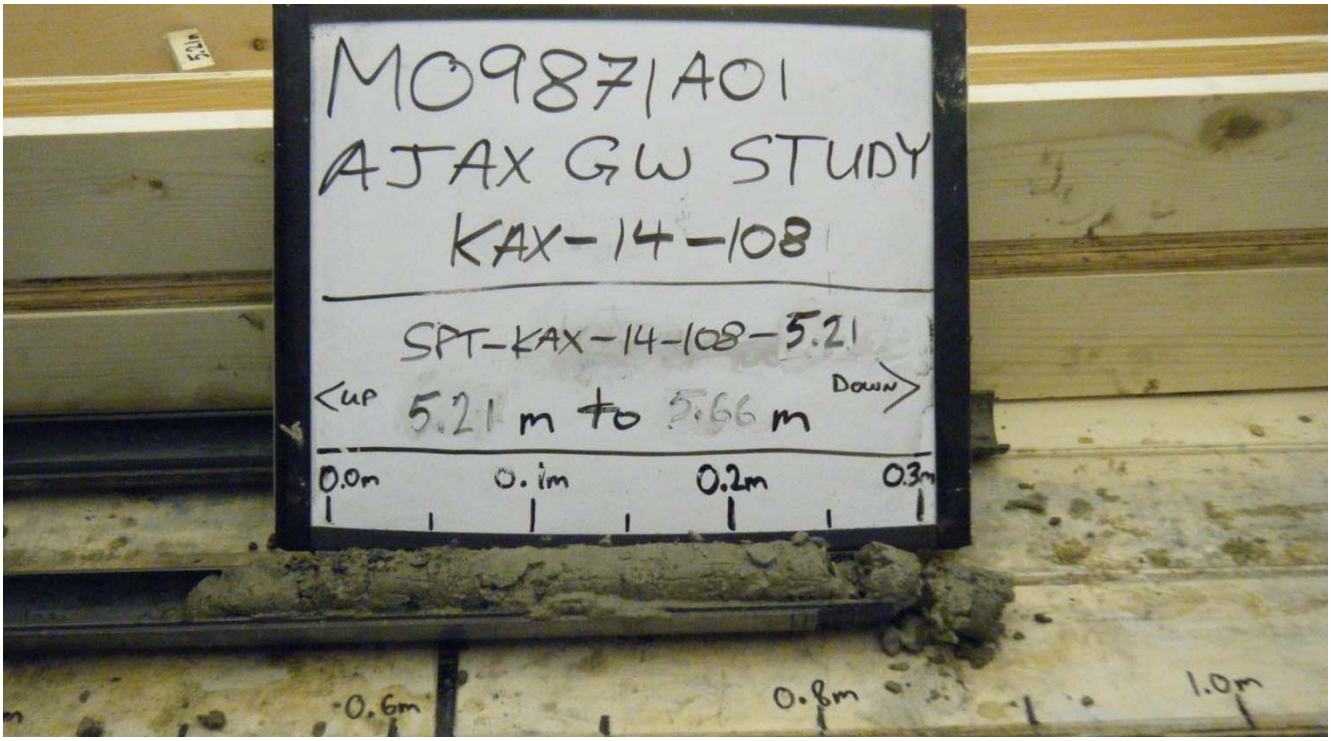


Photo II-35 KAX-14-108 SPT-KAX-14-108-5.2 m

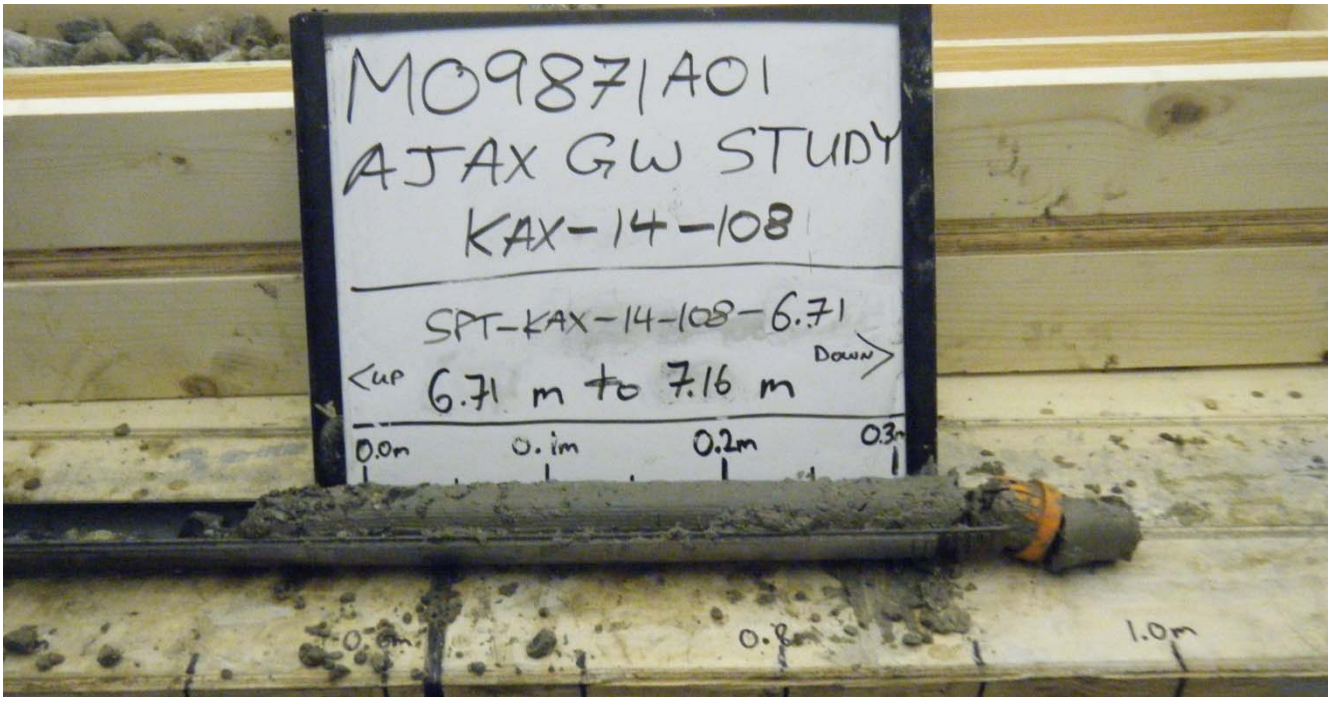


Photo II-36 KAX-14-108 SPT-KAX-14-108-6.7 m

Photo II-37 KAX-14-108 SPT-KAX-14-108-8.2 m

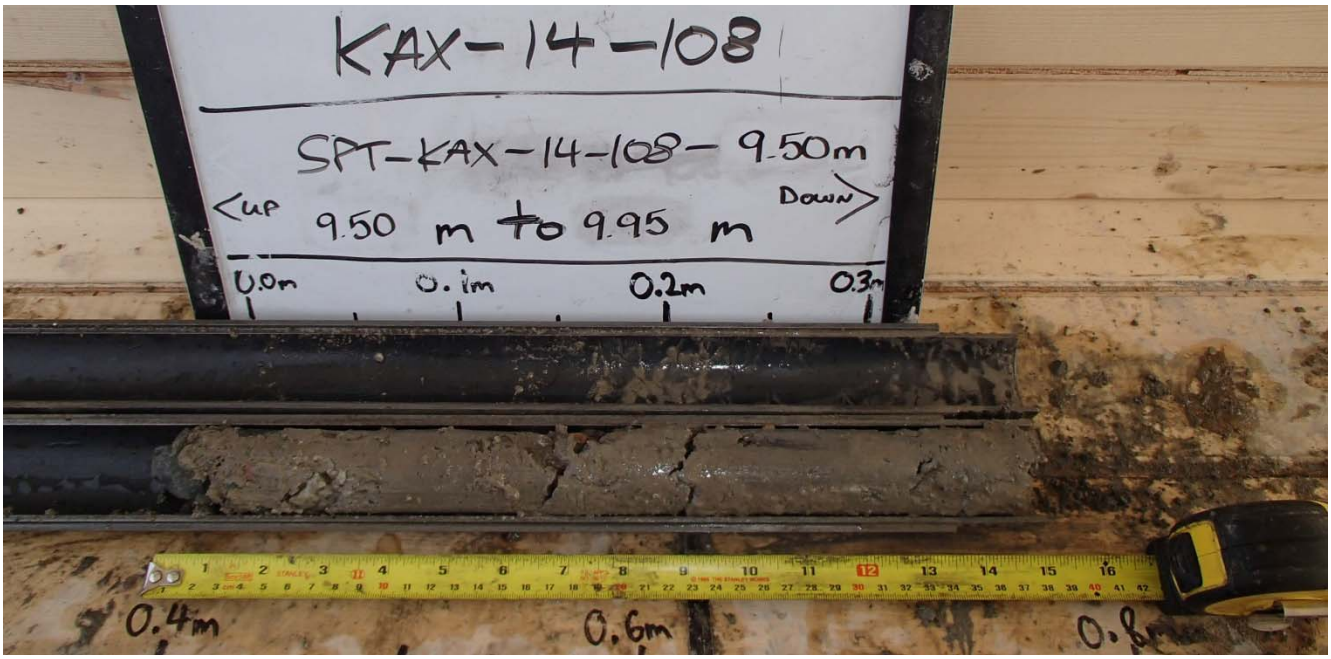


Photo II-38 KAX-14-108 SPT-KAX-14-108-9.5 m

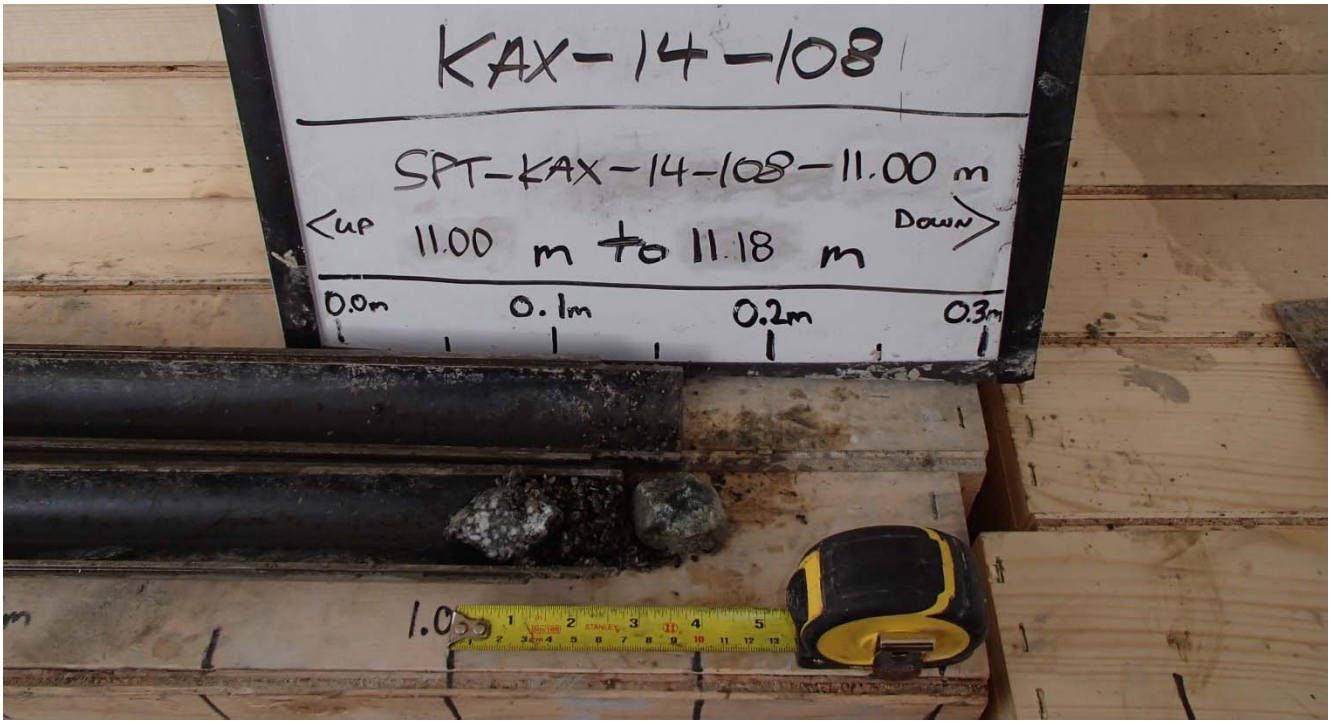


Photo II-39 KAX-14-108 SPT-KAX-14-108-11.0 m

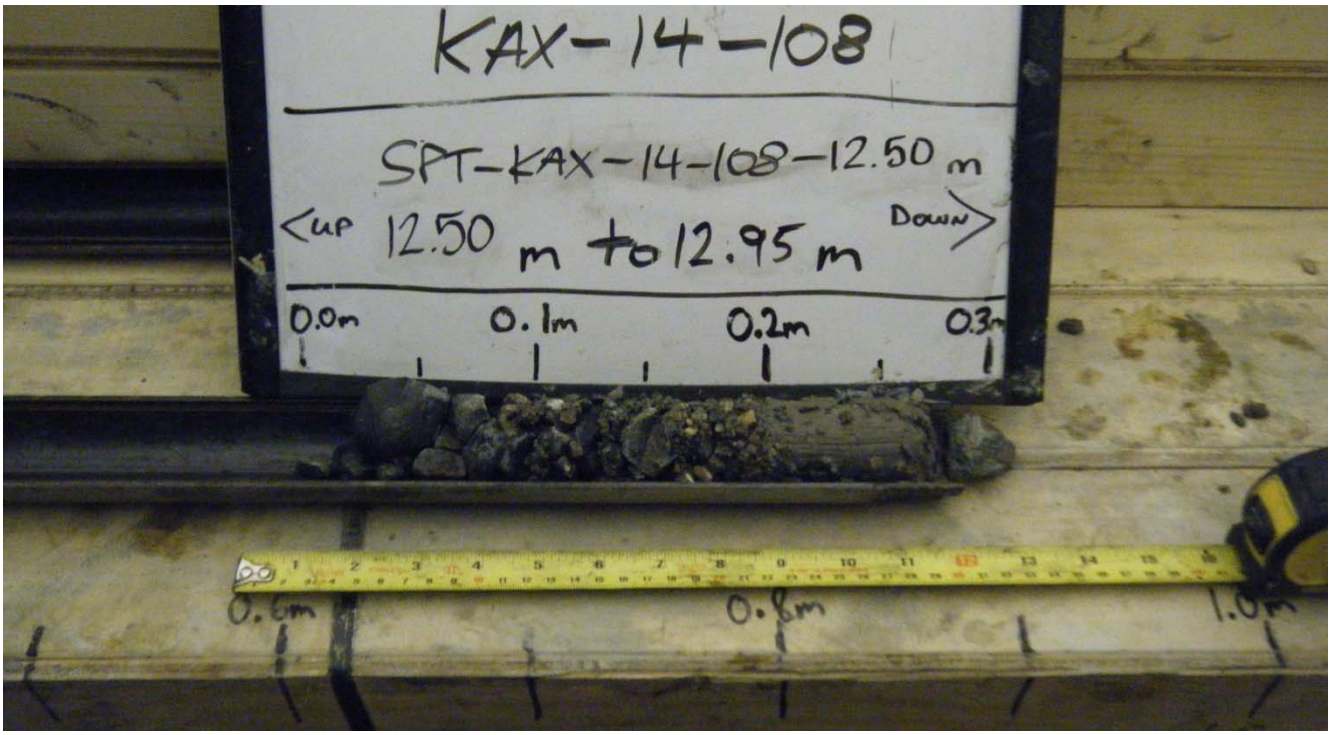


Photo II-40 KAX-14-108 SPT-KAX-14-108-12.5 m

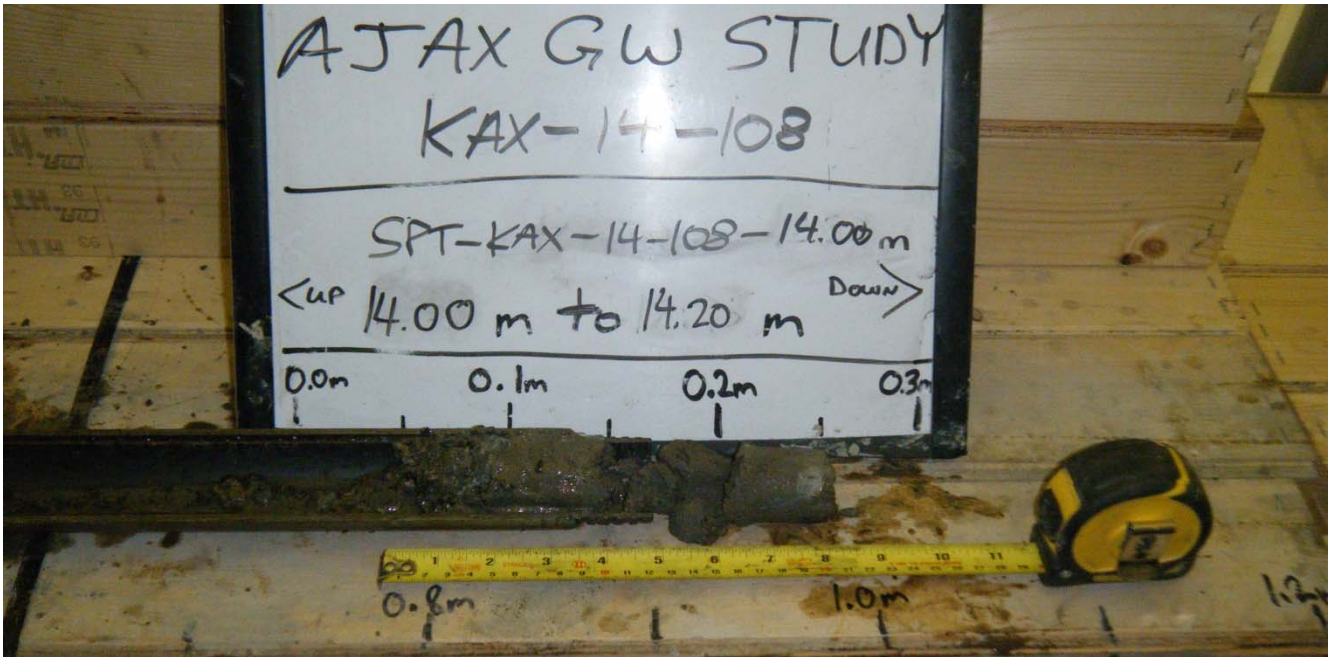


Photo II-41 KAX-14-108 SPT-KAX-14-108-14.0 m

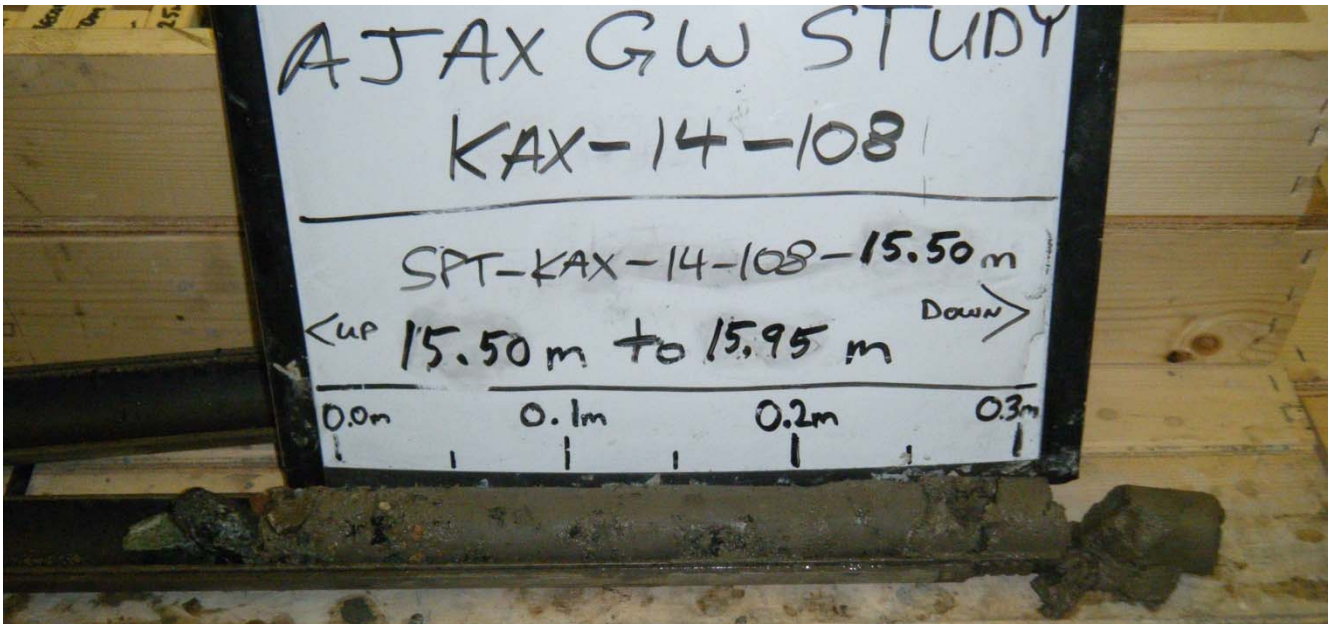


Photo II-42 KAX-14-108 SPT-KAX-14-108-15.5 m

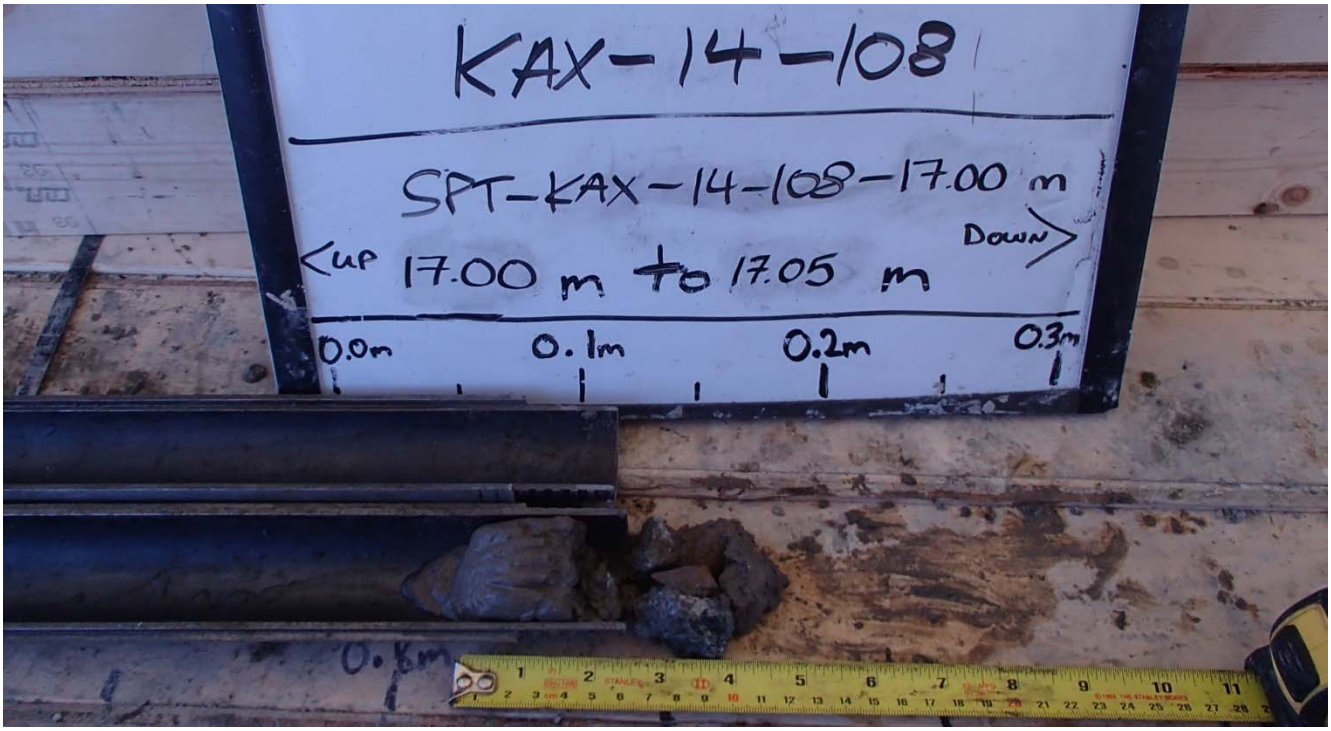


Photo II-43 KAX-14-108 SPT-KAX-14-108-17.0 m

No sample recovered at 18.5 m

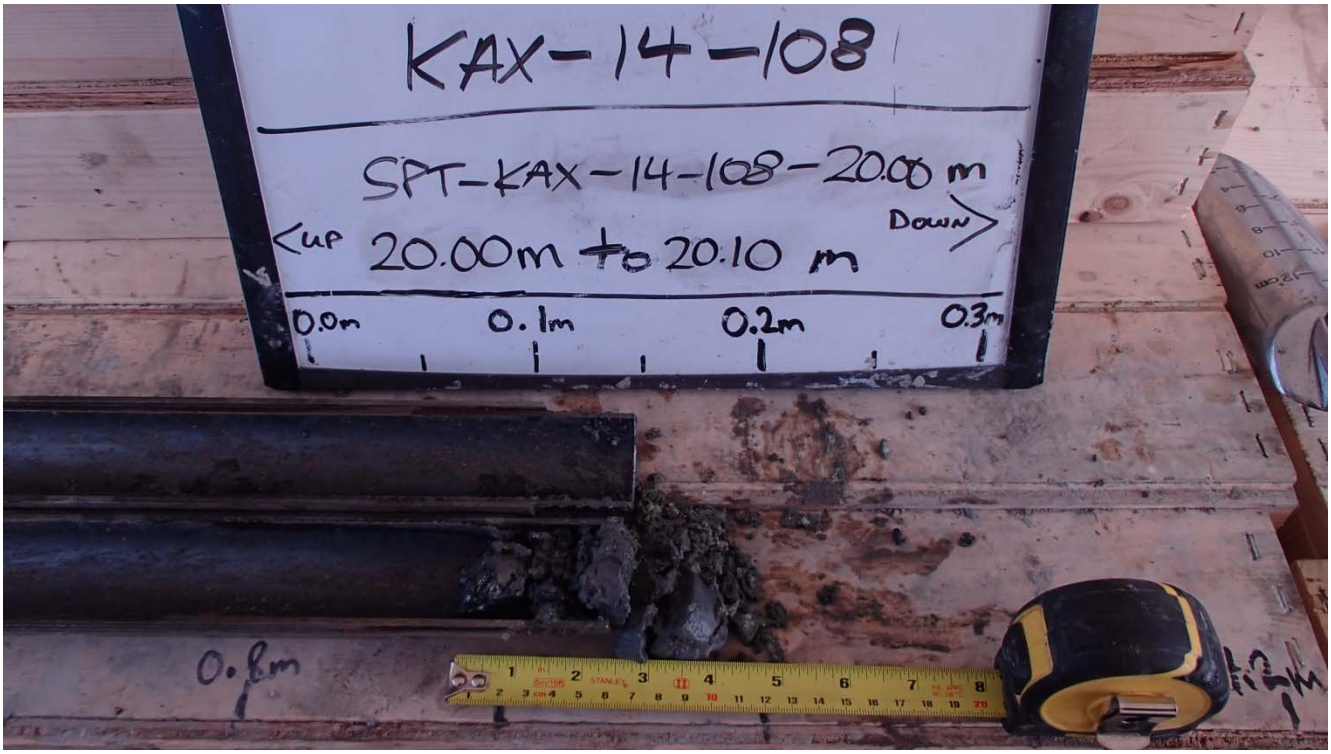


Photo II-44 KAX-14-108 SPT-KAX-14-108-20.0 m

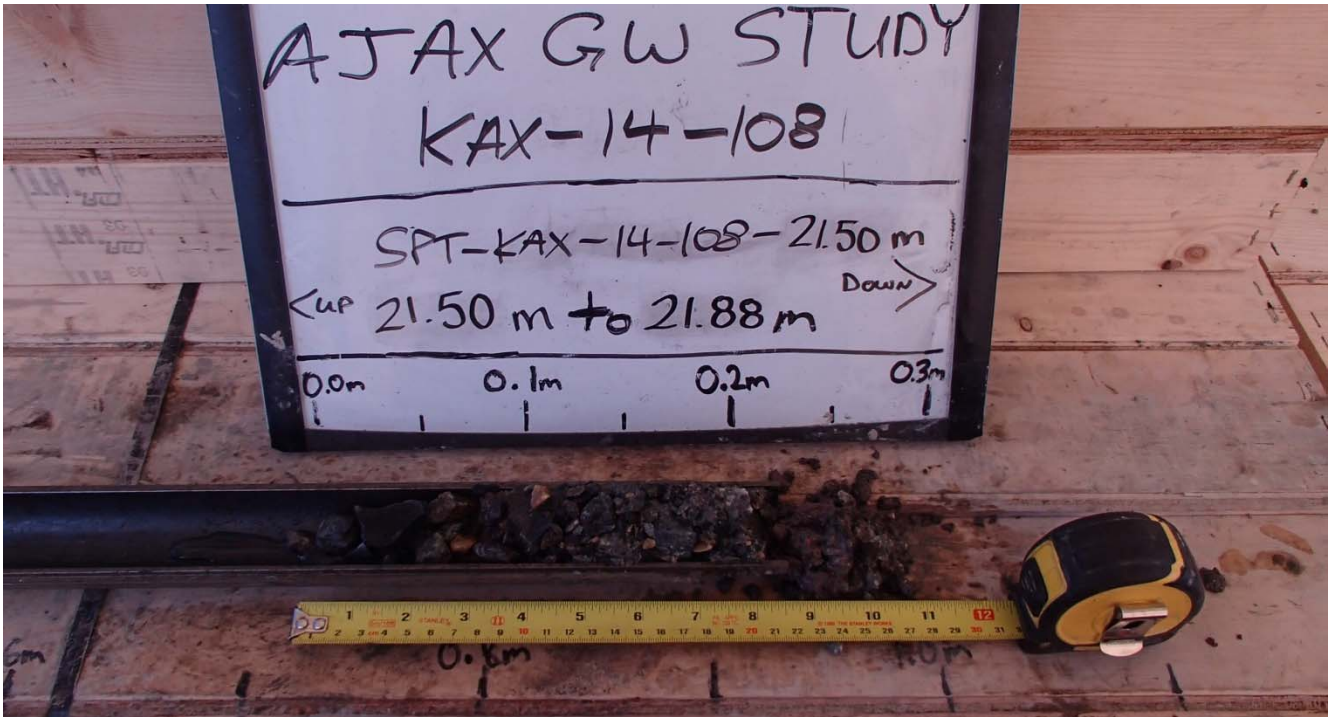


Photo II-45 KAX-14-108 SPT-KAX-14-108-21.5 m

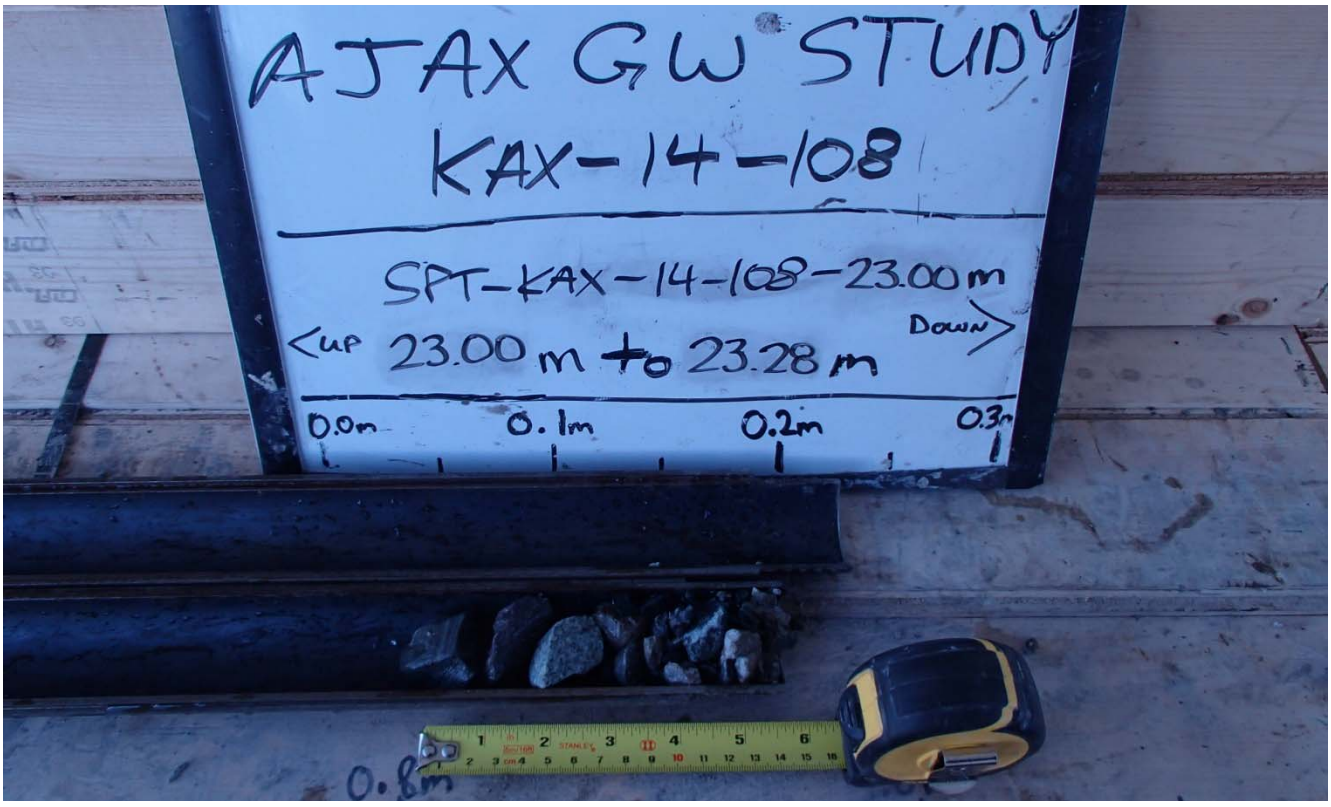


Photo II-46 KAX-14-108 SPT-KAX-14-108-23.0 m

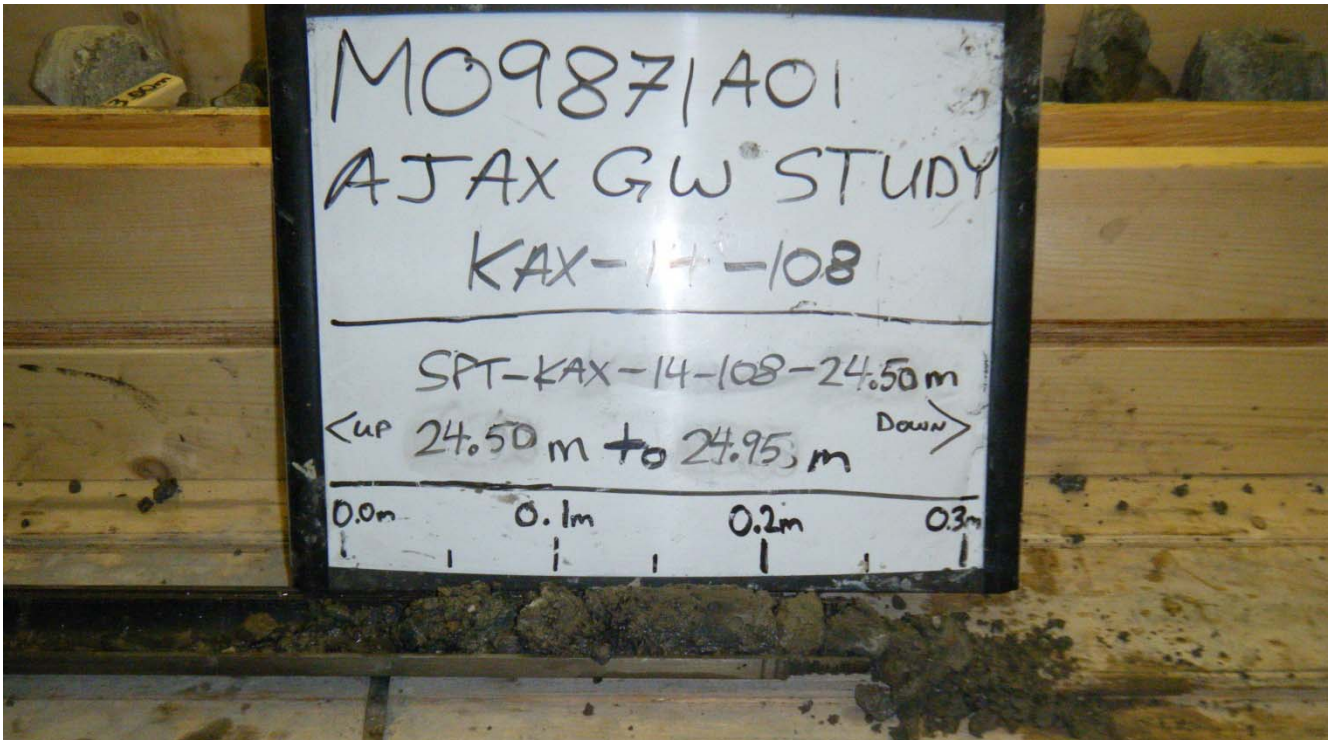


Photo II-47 KAX-14-108 SPT-KAX-14-108-24.5 m

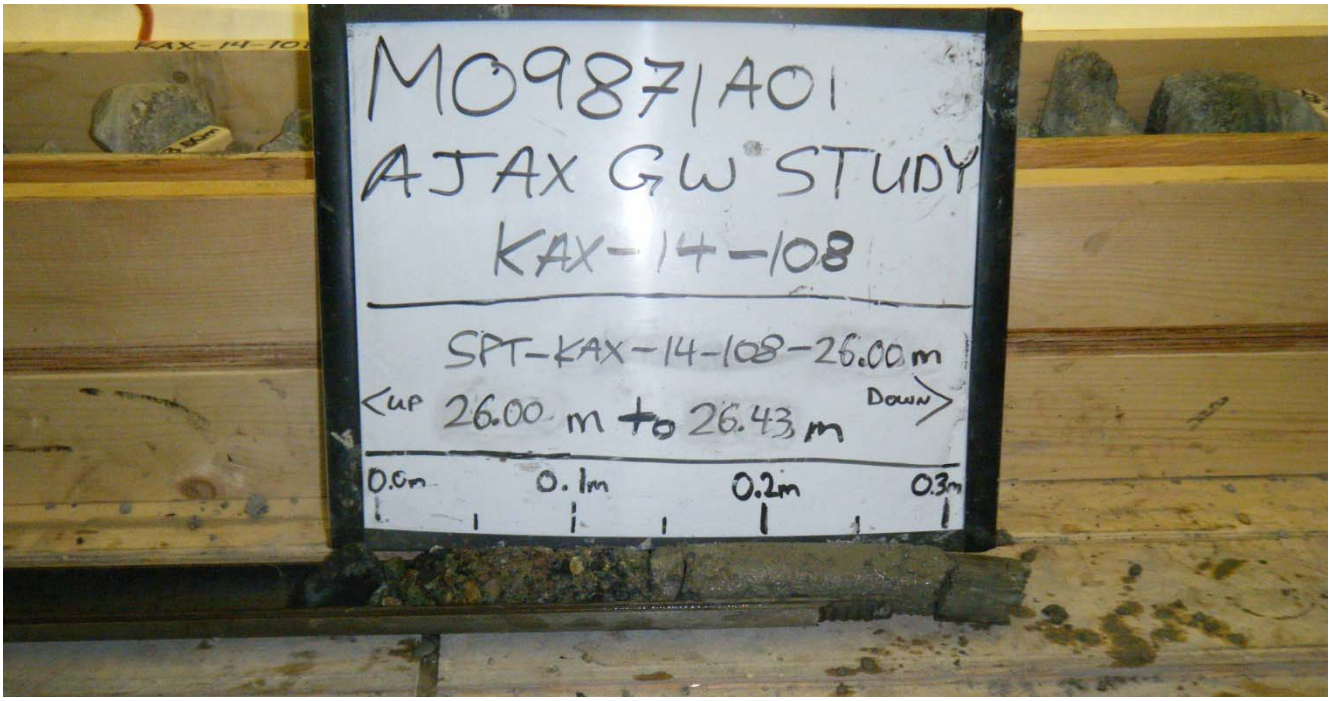


Photo II-48 KAX-14-108 SPT-KAX-14-108-26.0 m

Missing photo at 27.5 m.

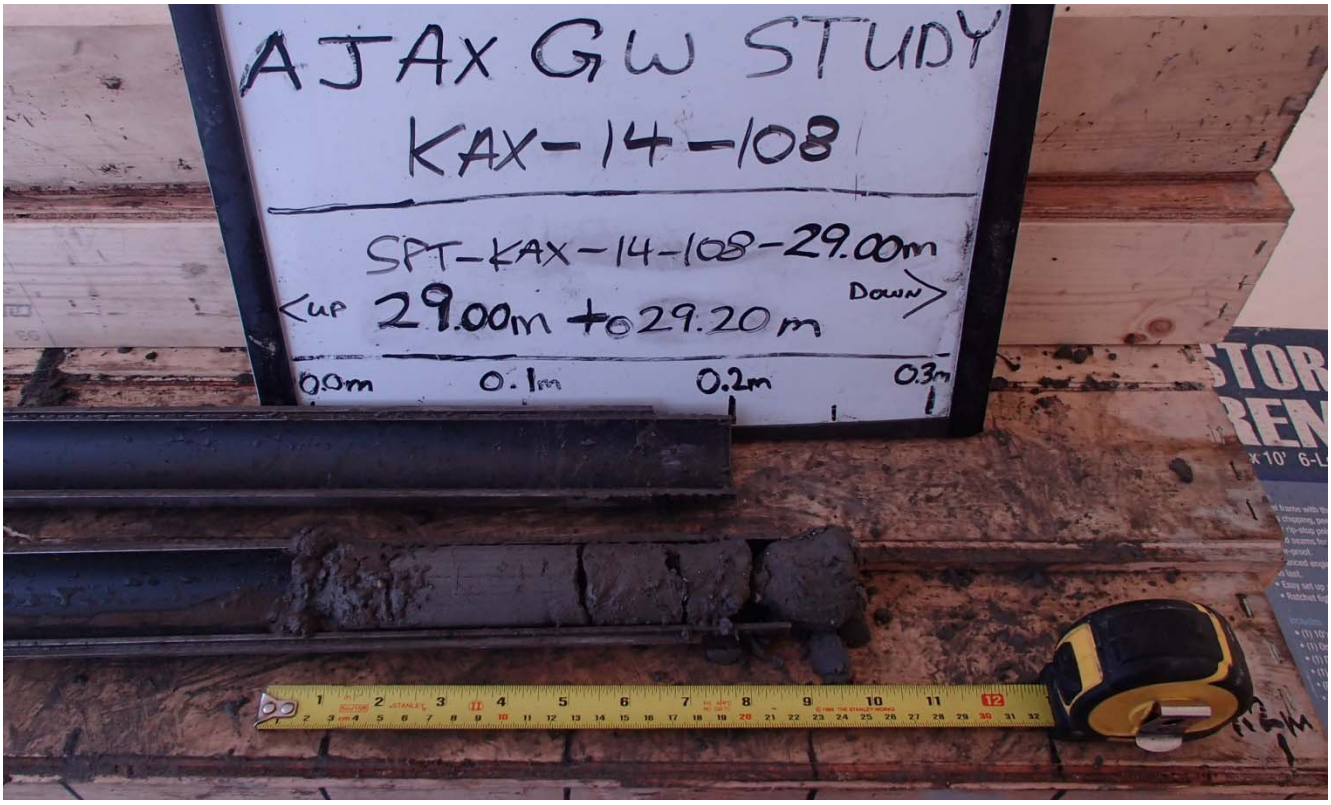


Photo II-49 KAX-14-108 SPT-KAX-14-108-29.0 m

Photo II-50 KAX-14-108 SPT-KAX-14-108-30.5 m

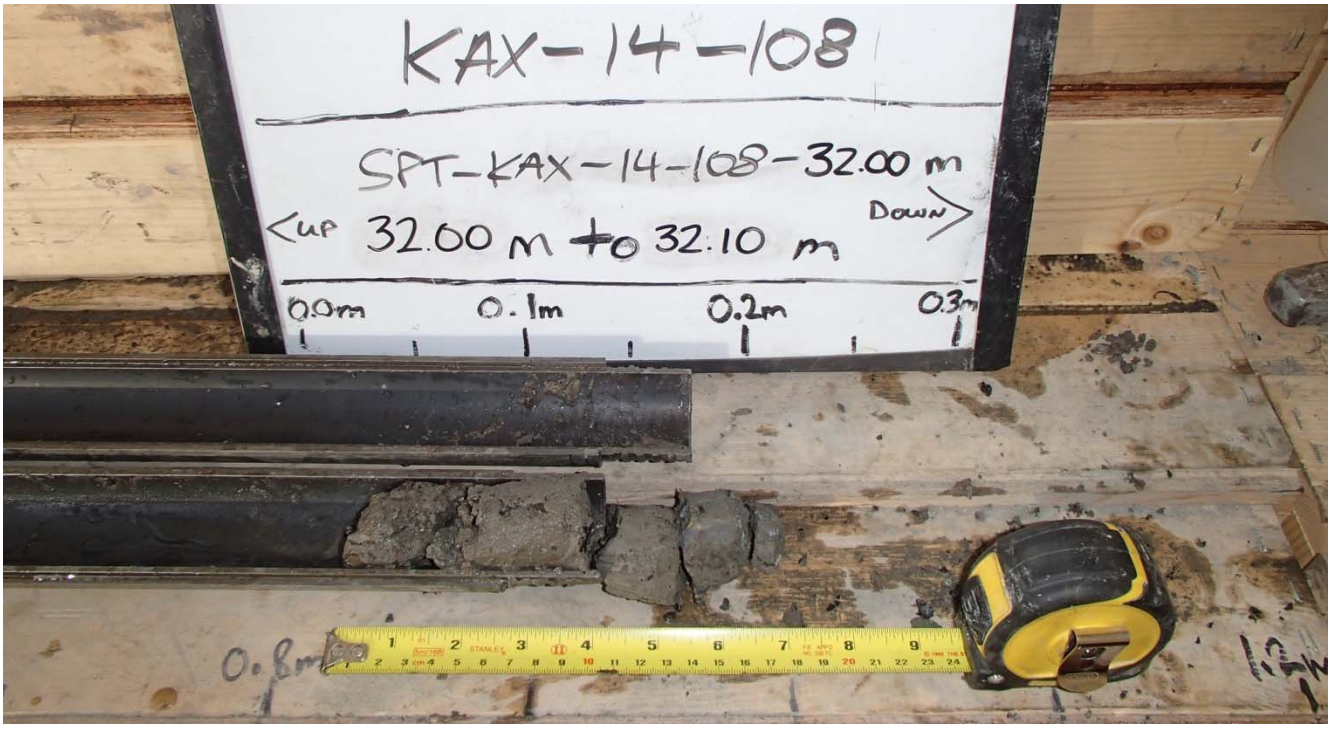


Photo II-51 KAX-14-108 SPT-KAX-14-108-32.0 m

Photo II-52 KAX-14-108 SPT-KAX-14-108-33.5 m

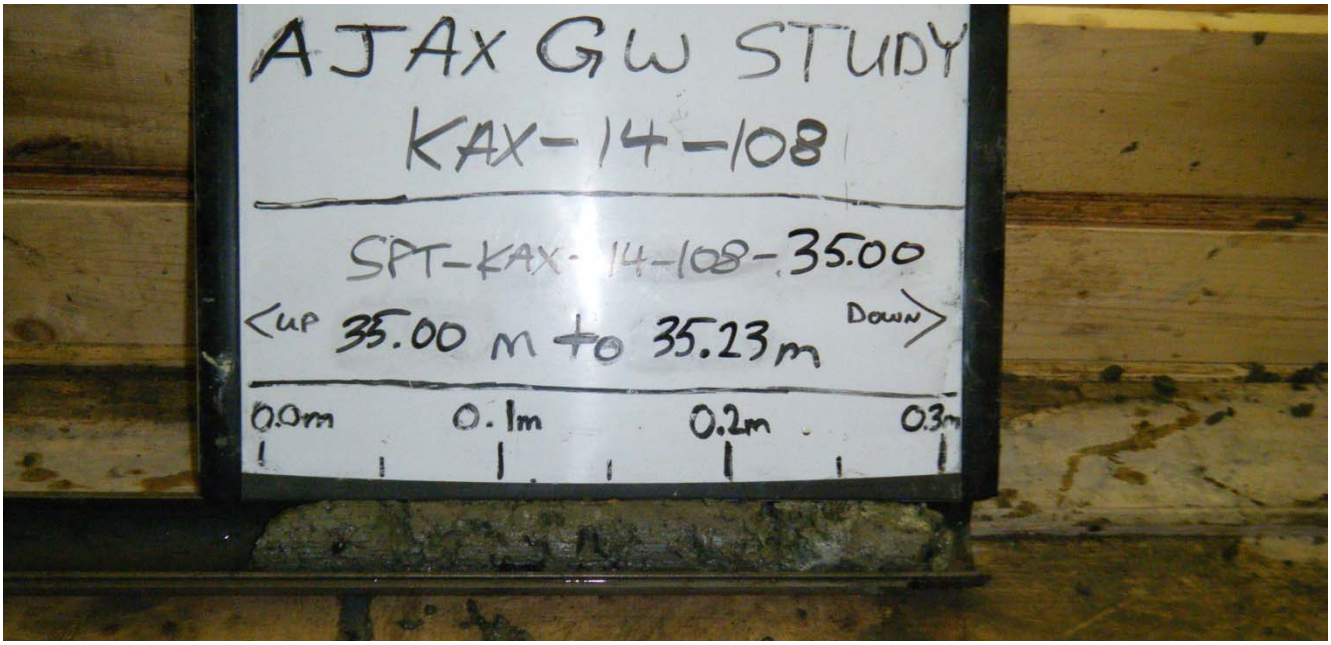


Photo II-53 KAX-14-108 SPT-KAX-14-108-35.0 m

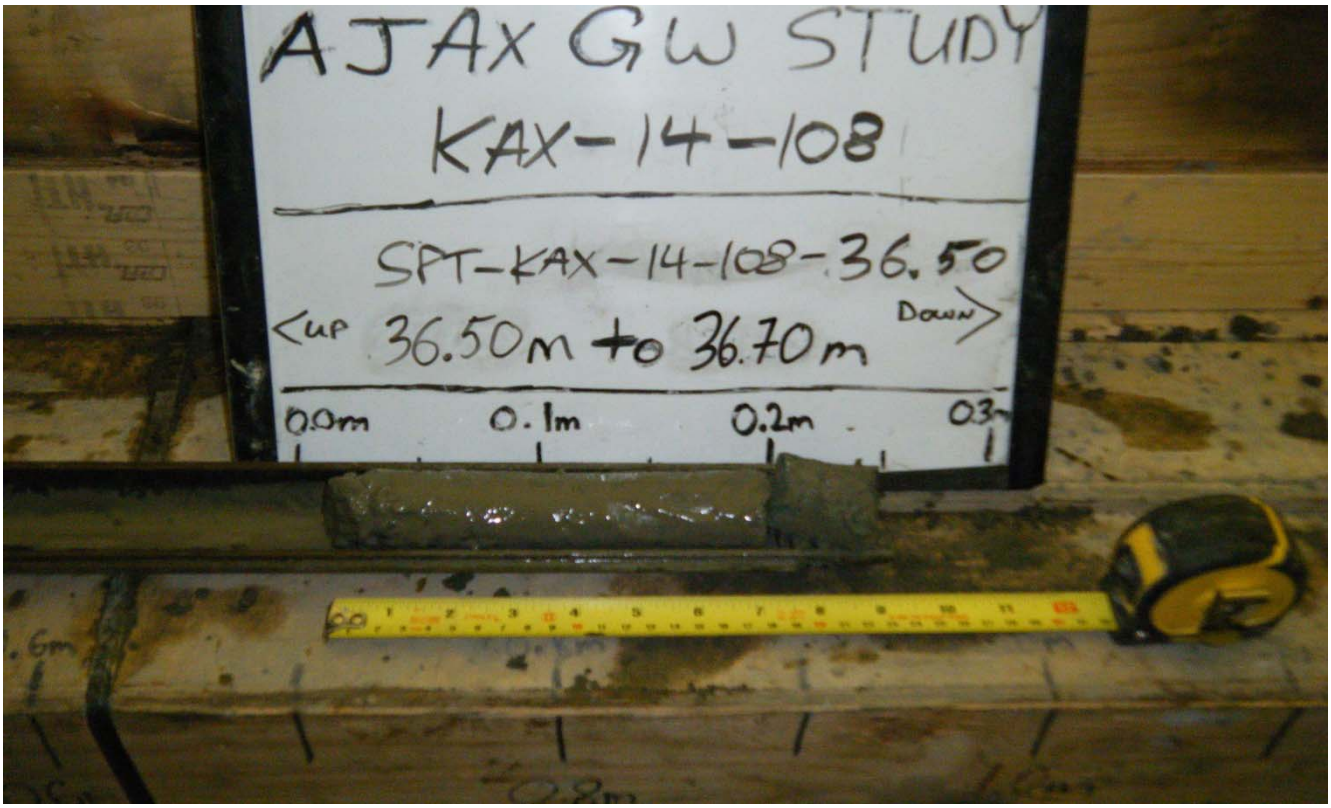


Photo II-54 KAX-14-108 SPT-KAX-14-108-36.5 m

Photo II-55 KAX-14-108 Boxes 1 to 3 0.0 m to 27.6 m

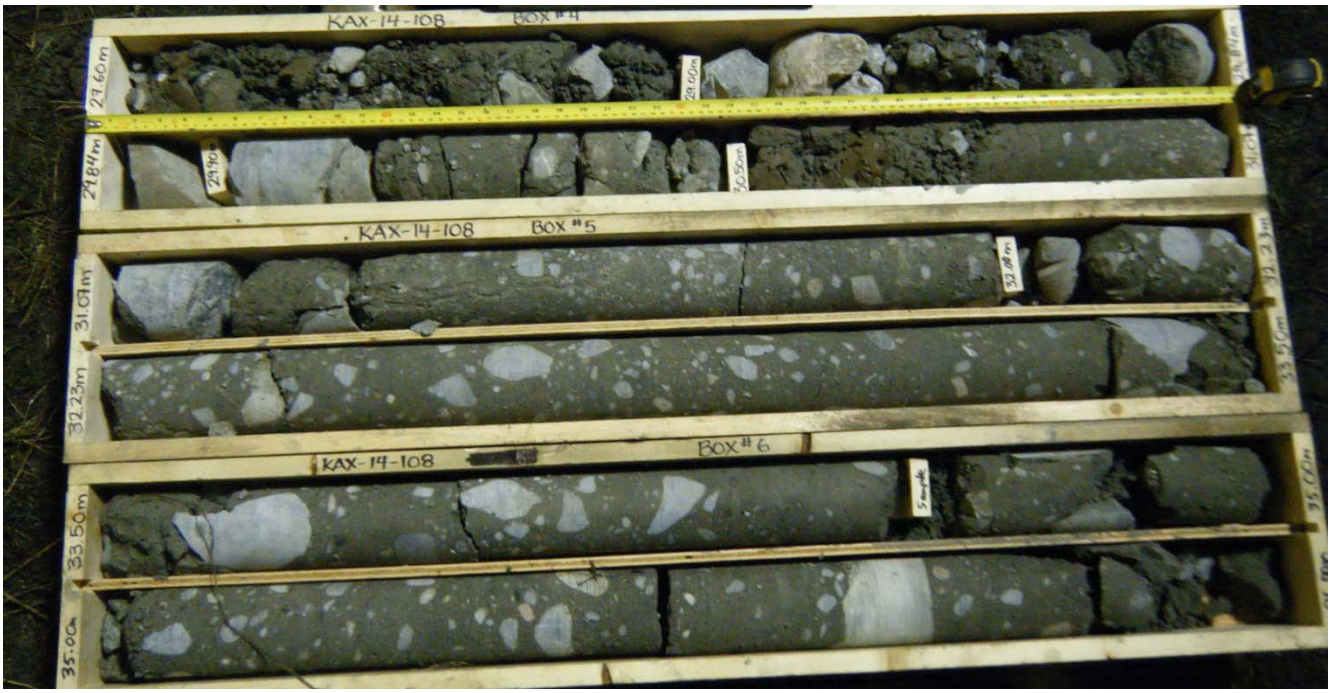


Photo II-56 KAX-14-108 Boxes 4 to 6 27.6 m to 36.0 m

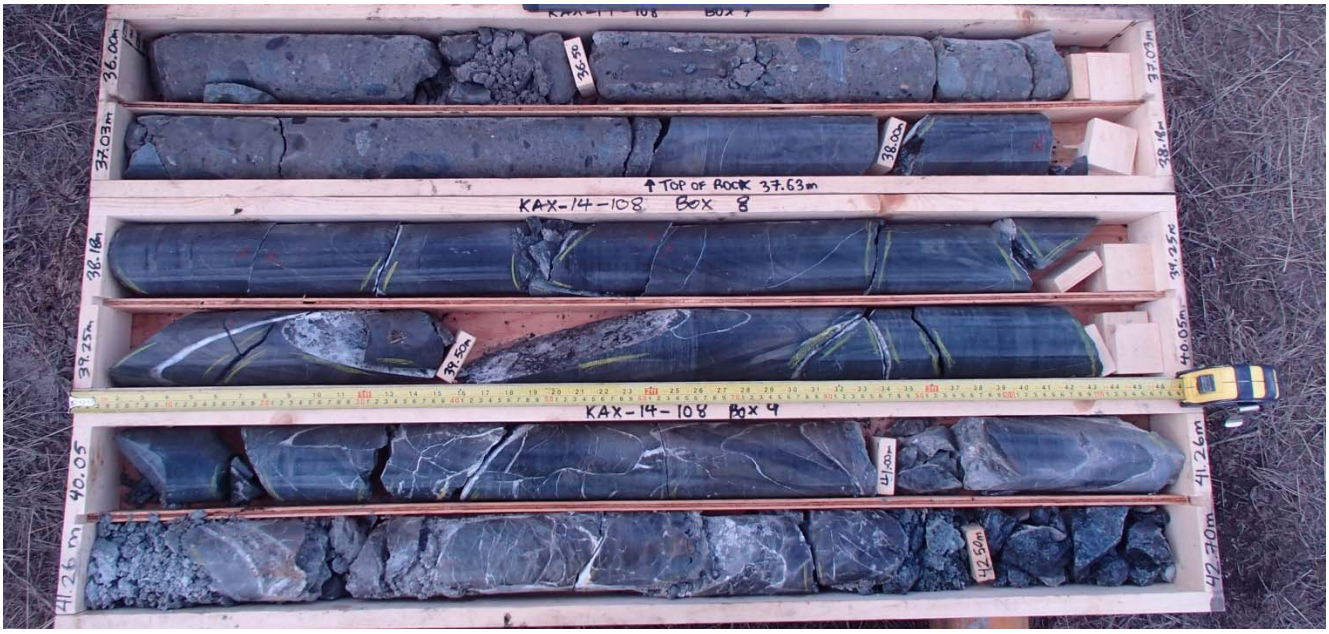


Photo II-57 KAX-14-108 Boxes 7 to 9 36.0 m to 42.7 m

Photo II-58 KAX-14-108 Boxes 10 to 12 42.7 m to 49.1 m

Photo II-59 KAX-14-108 Boxes 13 to 15 49.1 m to 56.8 m

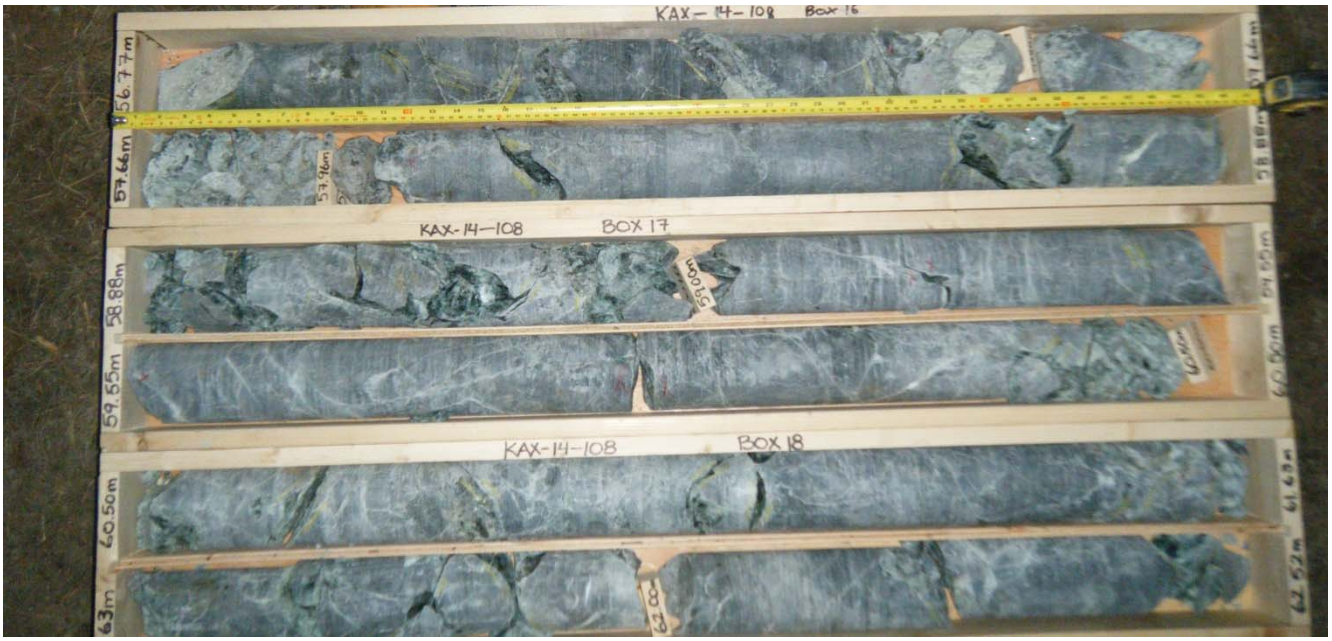


Photo II-60 KAX-14-108 Boxes 16 to 18 56.8 m to 62.5 m

Photo II-61 KAX-14-108 Boxes 19 to 21 62.5 m to 69.2 m

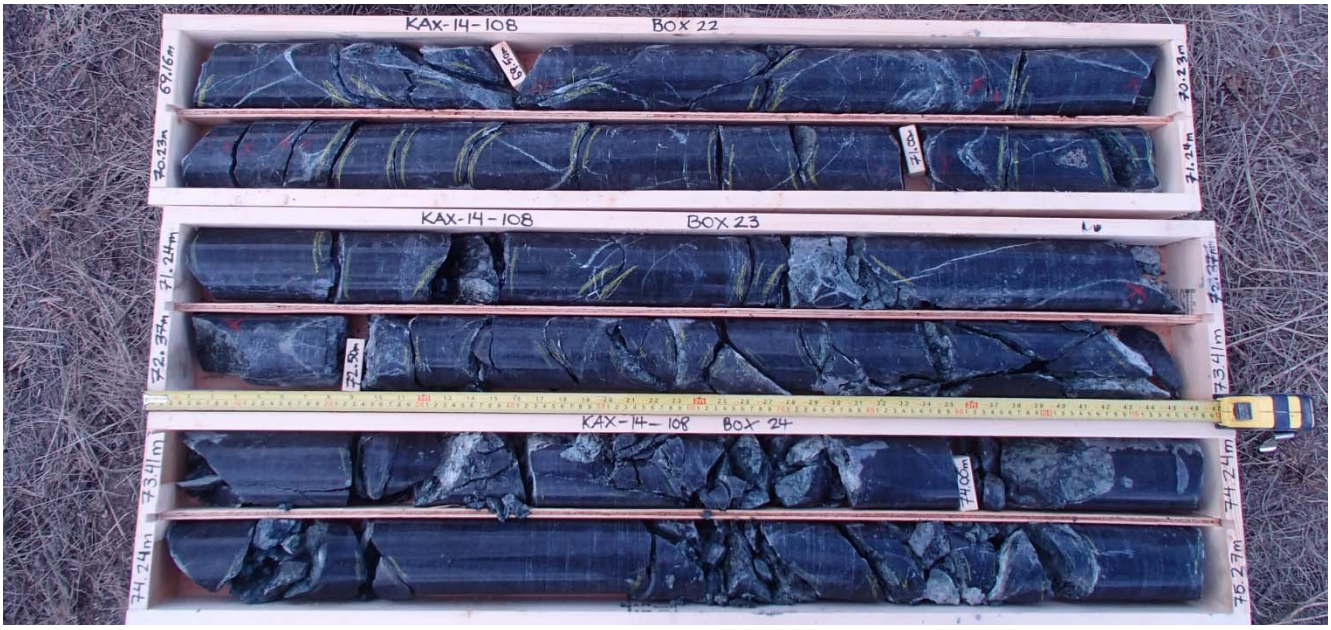


Photo II-62 KAX-14-108 Boxes 22 to 24 69.2 m to 75.3 m

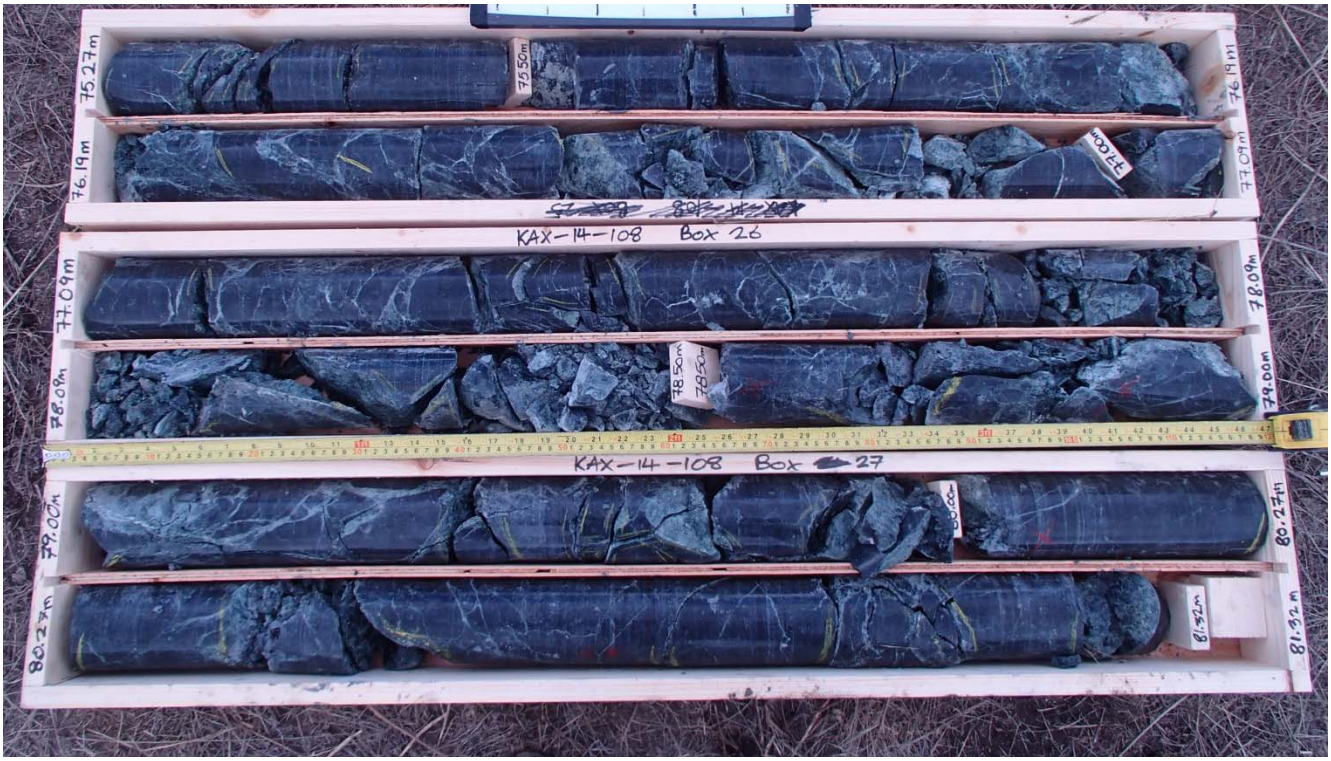


Photo II-63 KAX-14-108 Boxes 25 to 27 75.3 m to 81.3 m

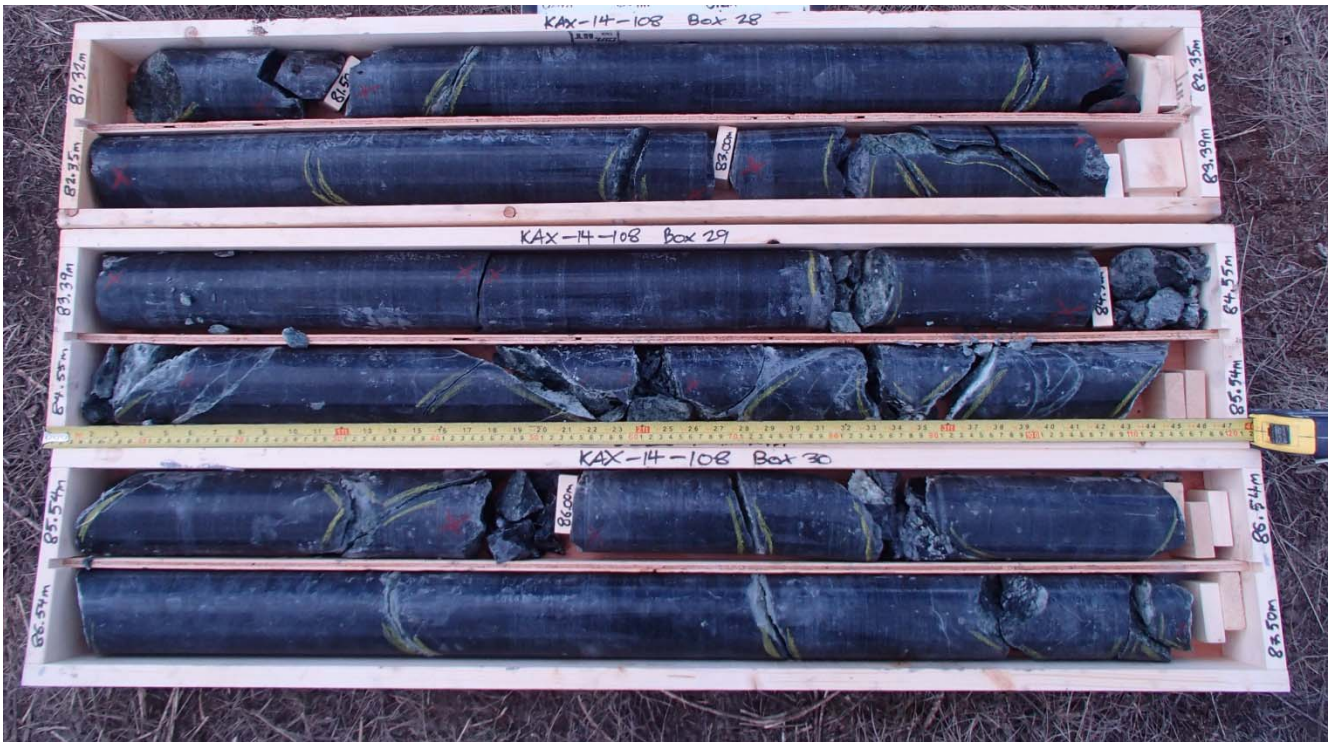


Photo II-64 KAX-14-108 Boxes 28 to 30 81.3 m to 87.5 m

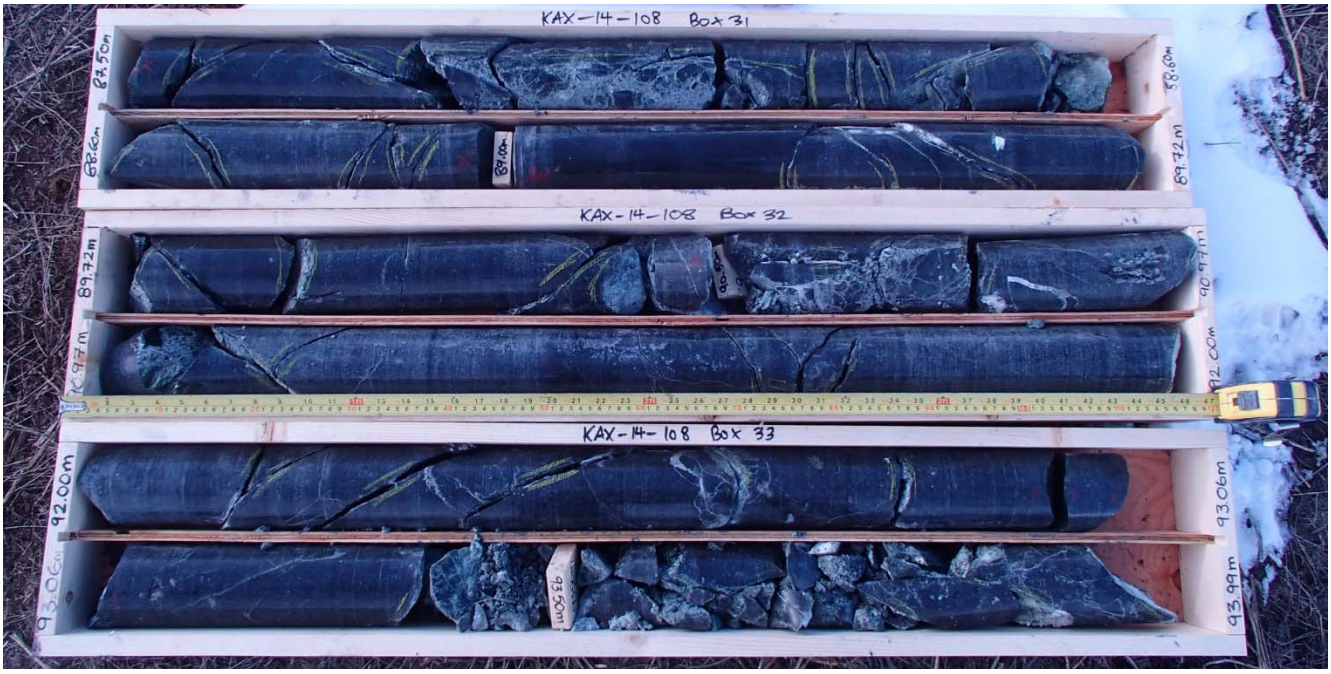


Photo II-65 KAX-14-108 Boxes 31 to 33 87.5 m to 94.0 m

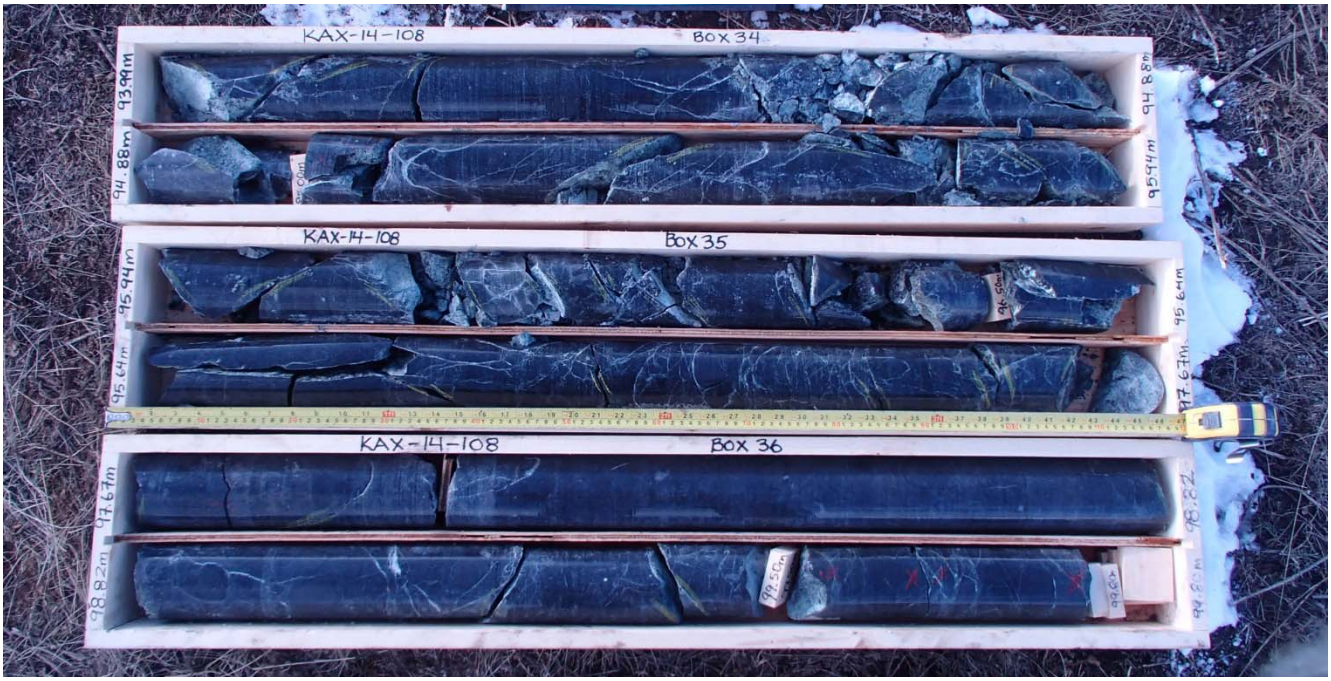


Photo II-66 KAX-14-108 Boxes 34 to 36 94.0 m to 99.8 m

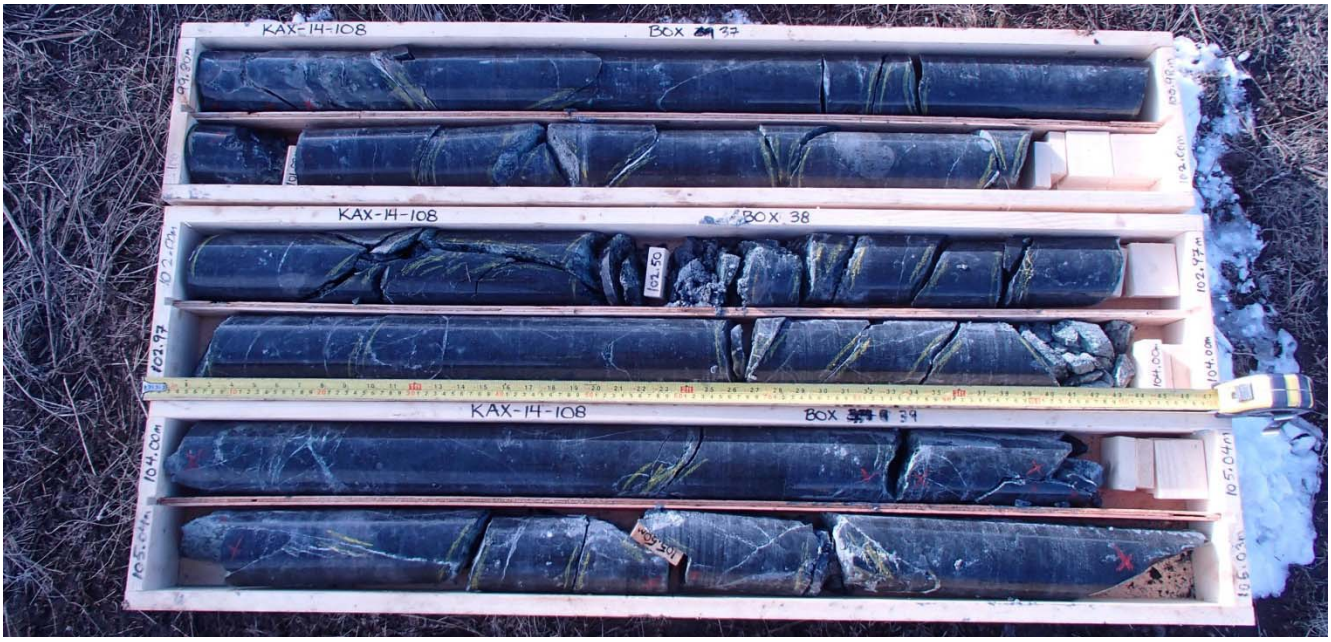


Photo II-67 KAX-14-108 Boxes 37 to 39 99.8 m to 106.0 m

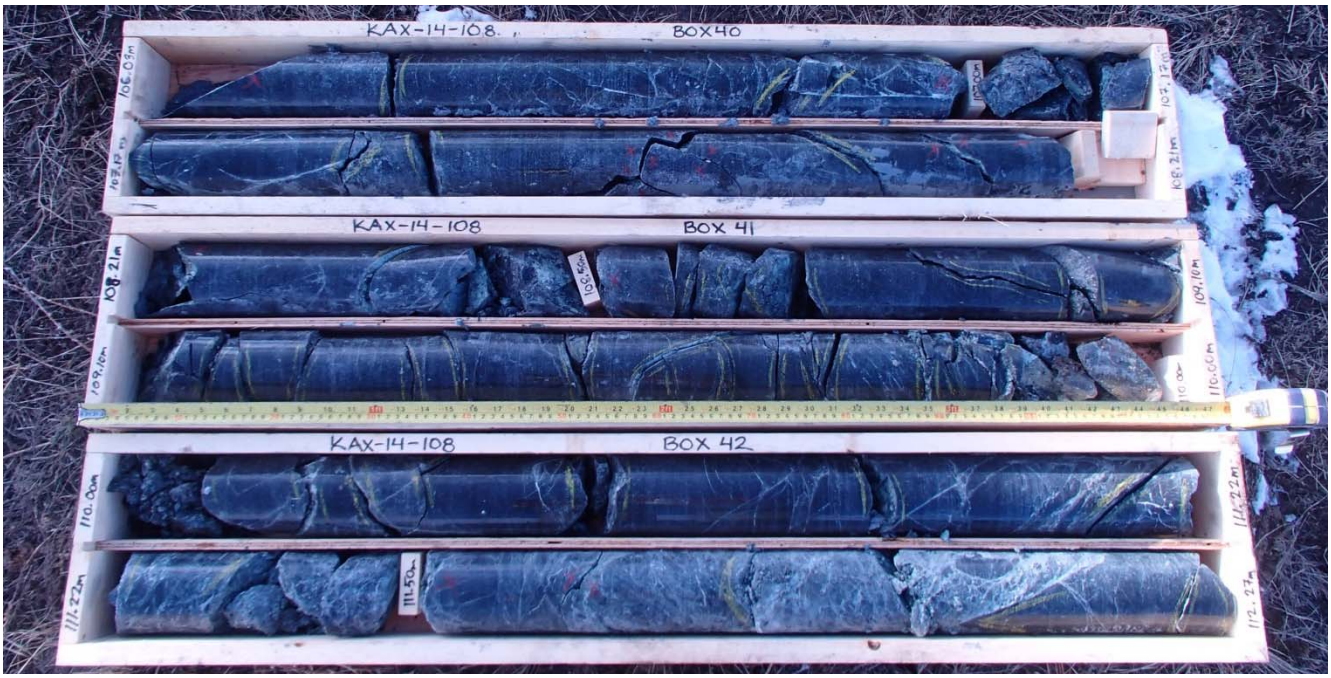


Photo II-68 KAX-14-108 Boxes 40 to 42 106.0 m to 112.3 m

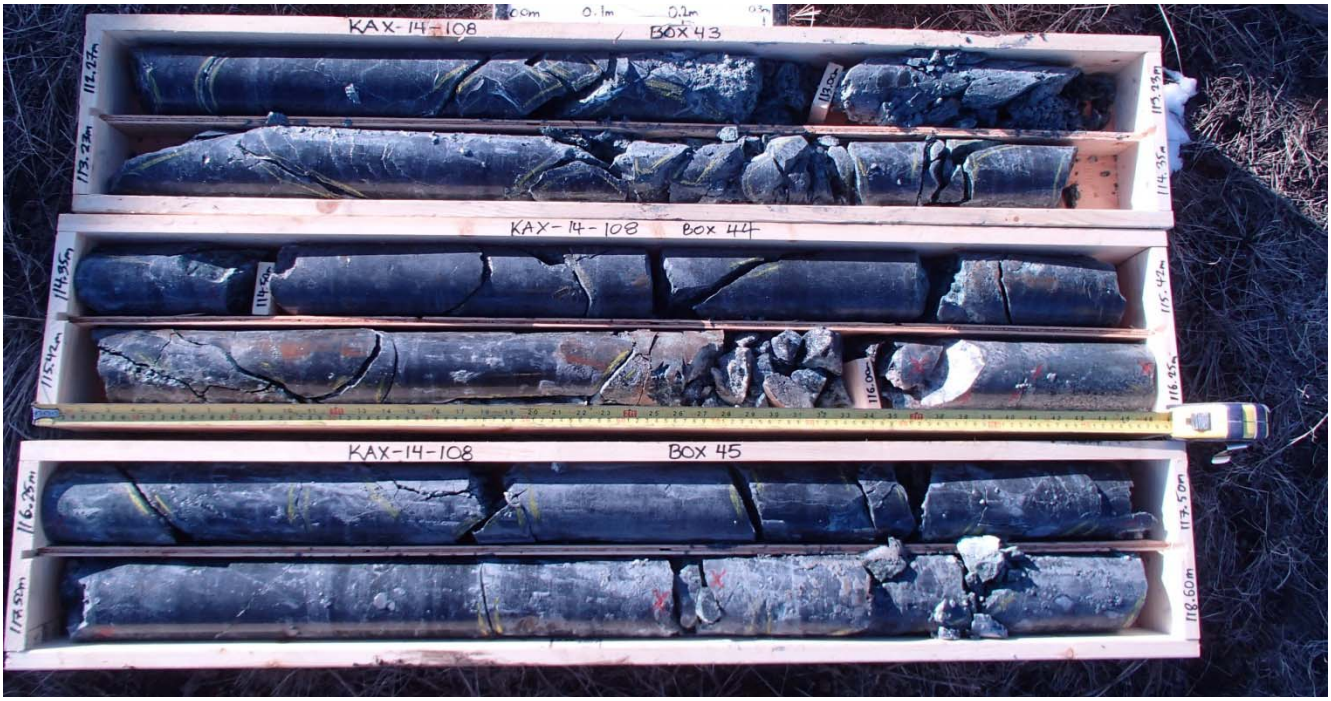


Photo II-69 KAX-14-108 Boxes 43 to 45 112.3 m to 118.6 m

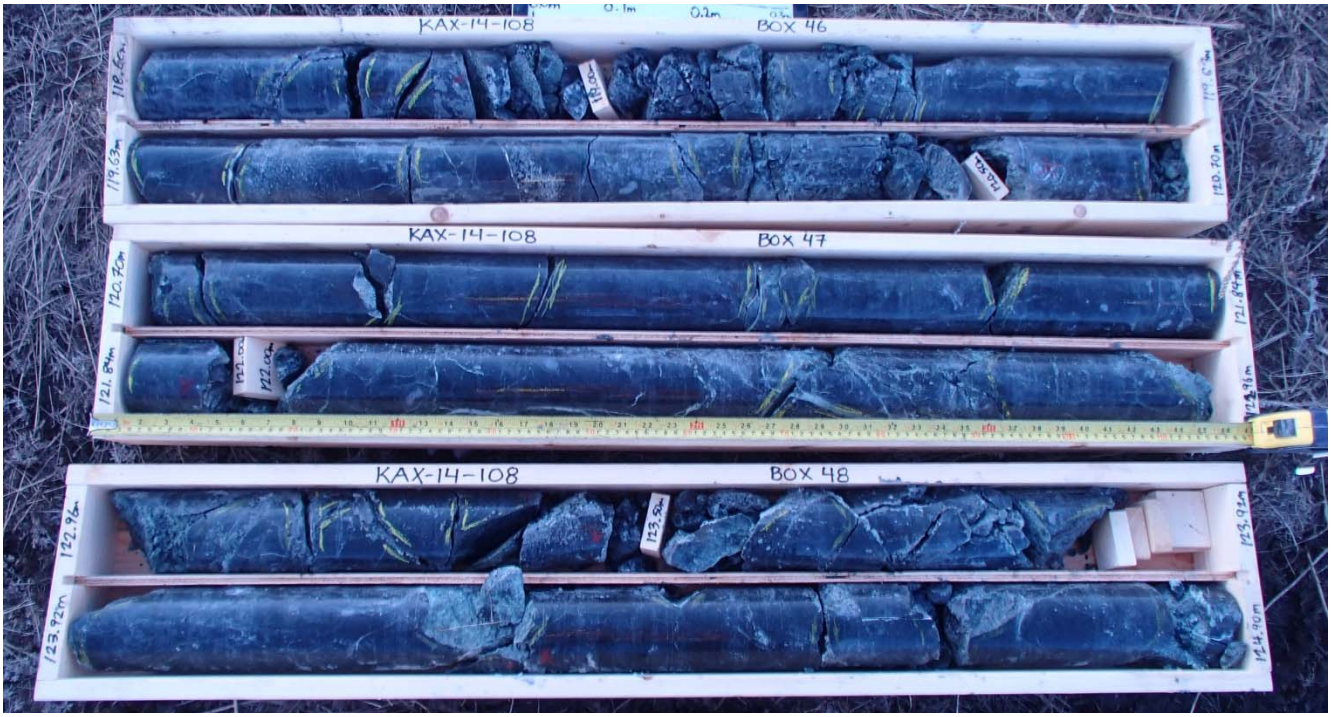


Photo II-70 KAX-14-108 Boxes 46 to 48 118.6 m to 124.9 m

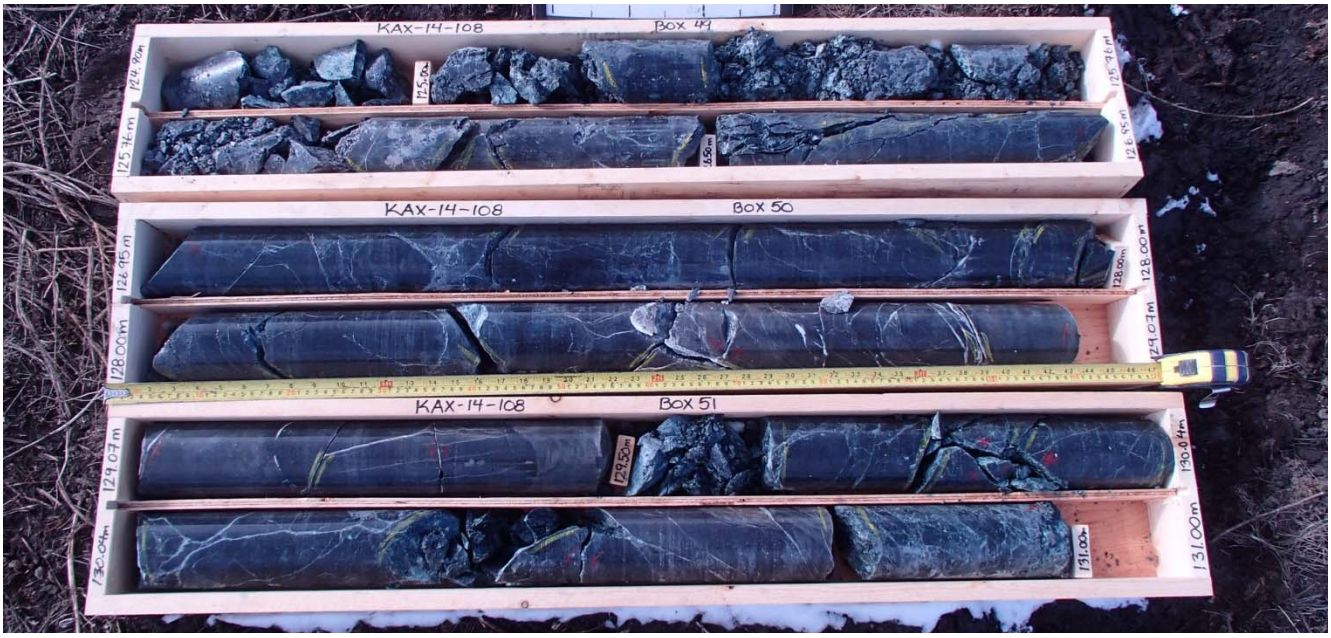


Photo II-71 KAX-14-108 Boxes 49 to 51 124.9 m to 131.0 m

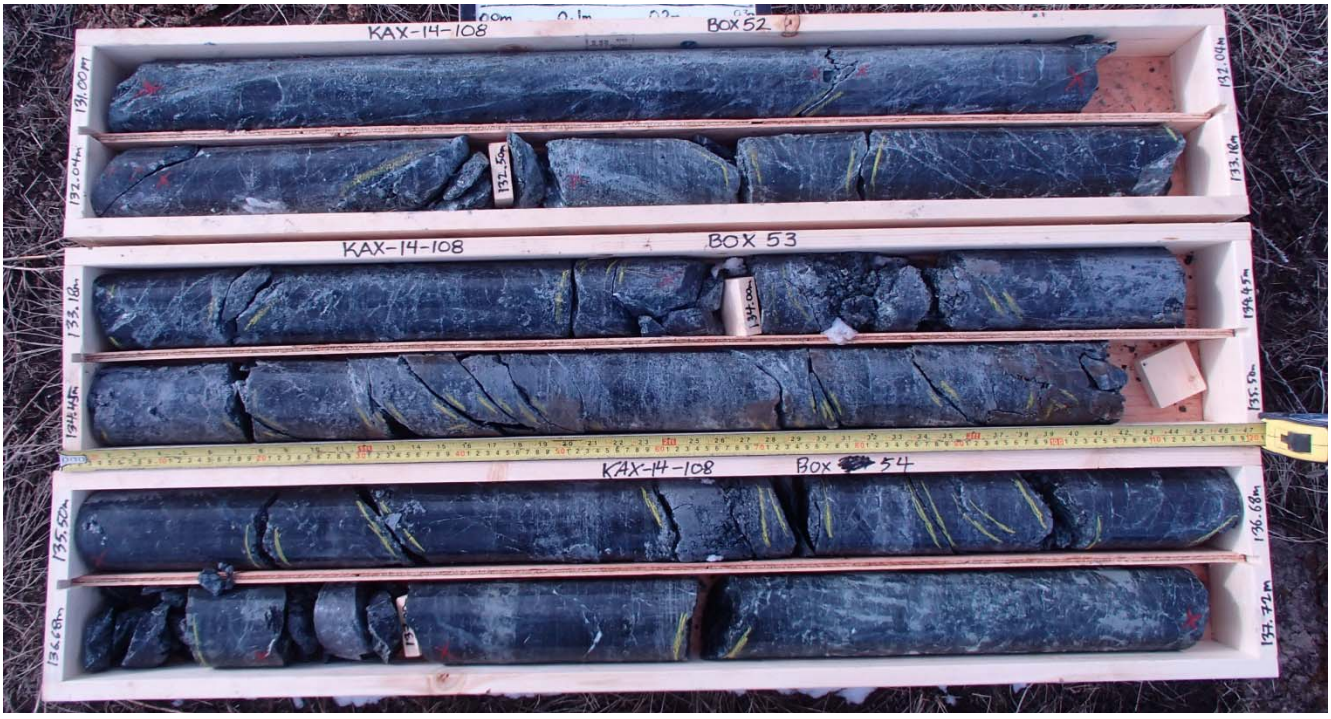


Photo II-72 KAX-14-108 Boxes 52 to 54 131.0 m to 137.7 m

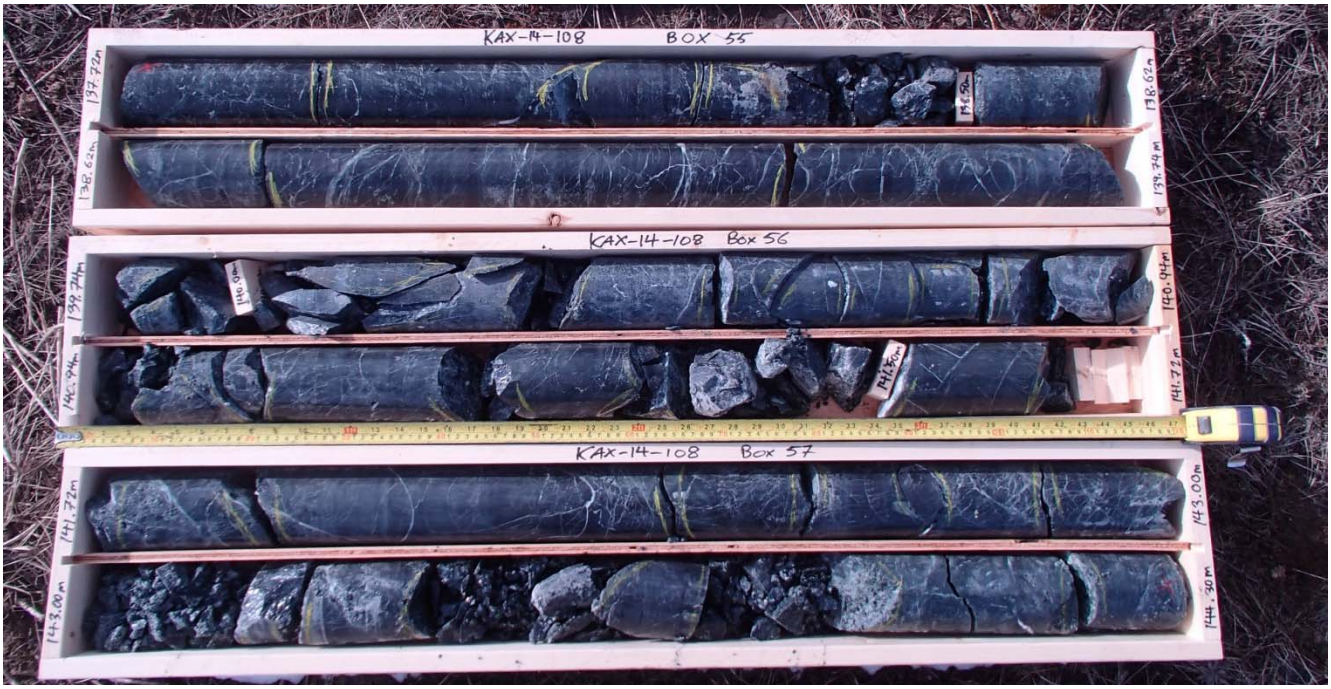


Photo II-73 KAX-14-108 Boxes 55 to 57 137.7 m to 144.3 m

Photo II-74 KAX-14-108 Boxes 58 to 59 144.3 m to 148.4 m

KAX-14-114

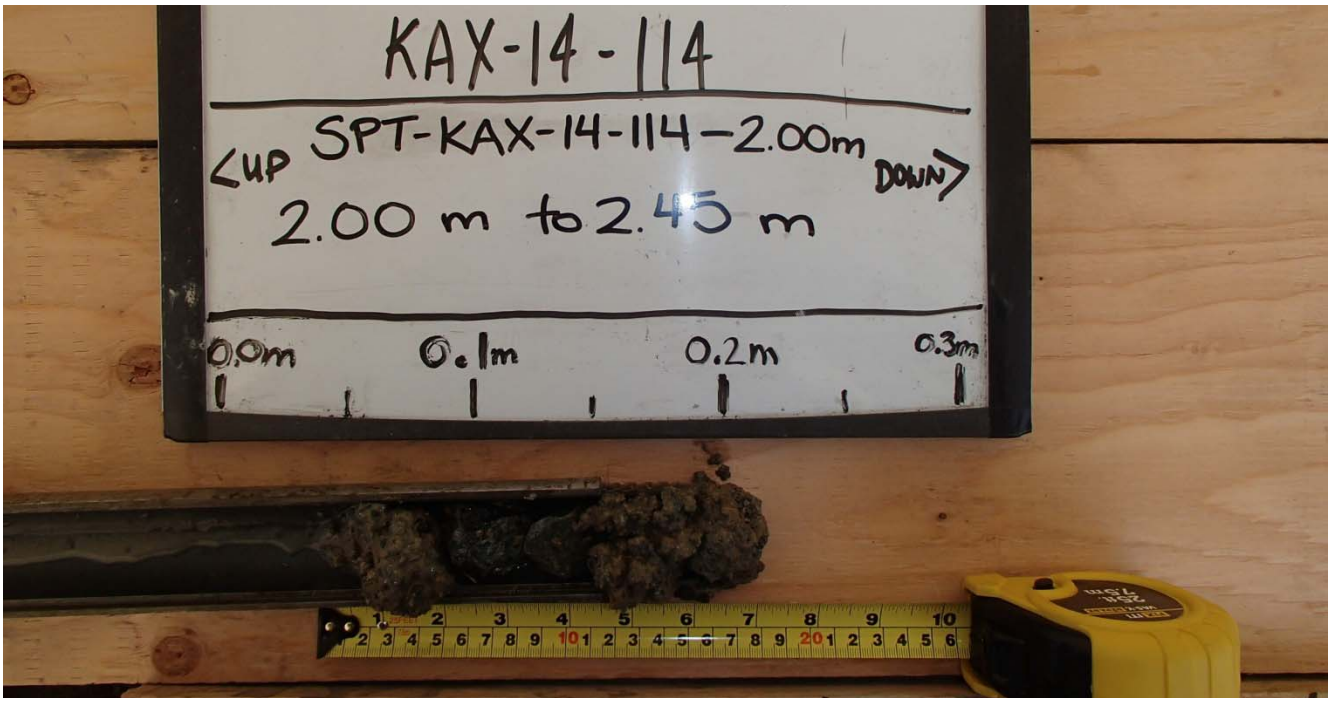


Photo II-75 KAX-14-114 SPT-KAX-14-114-2.0 m

Photo II-76 KAX-14-114 SPT-KAX-14-114-3.5 m

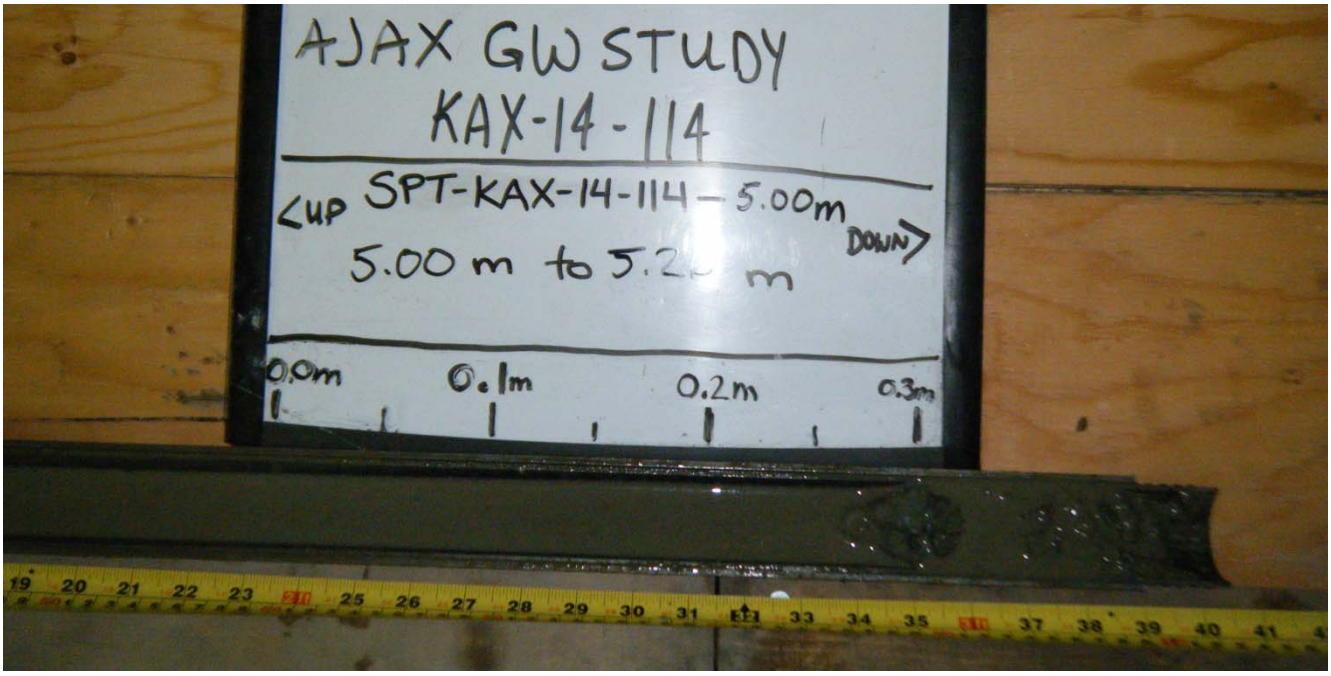


Photo II-77 KAX-14-114 SPT-KAX-14-114-5.0 m

No recovery at 6.5 m

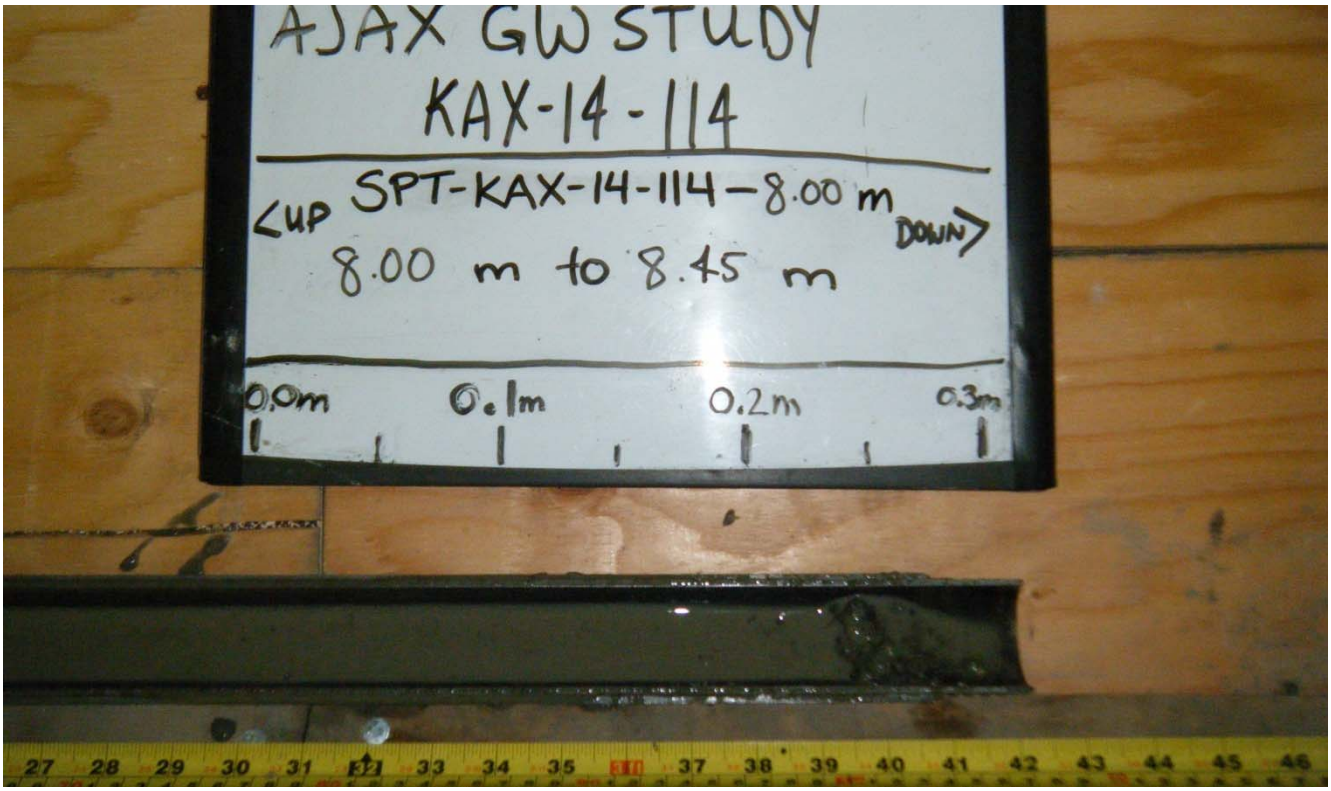


Photo II-78 KAX-14-114 SPT-KAX-14-114-8.0 m

Photo II-79 KAX-14-114 SPT-KAX-14-114-9.5 m

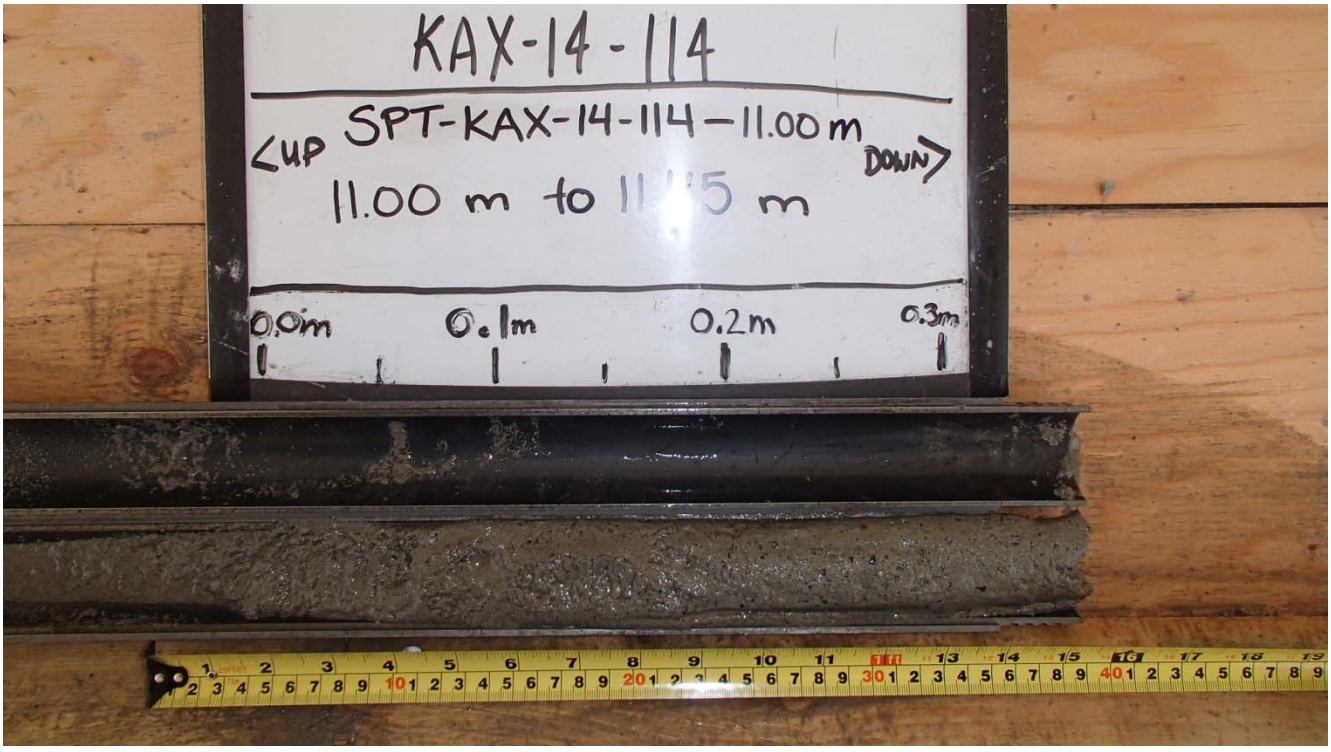


Photo II-80 KAX-14-114 SPT-KAX-14-114-11.0 m

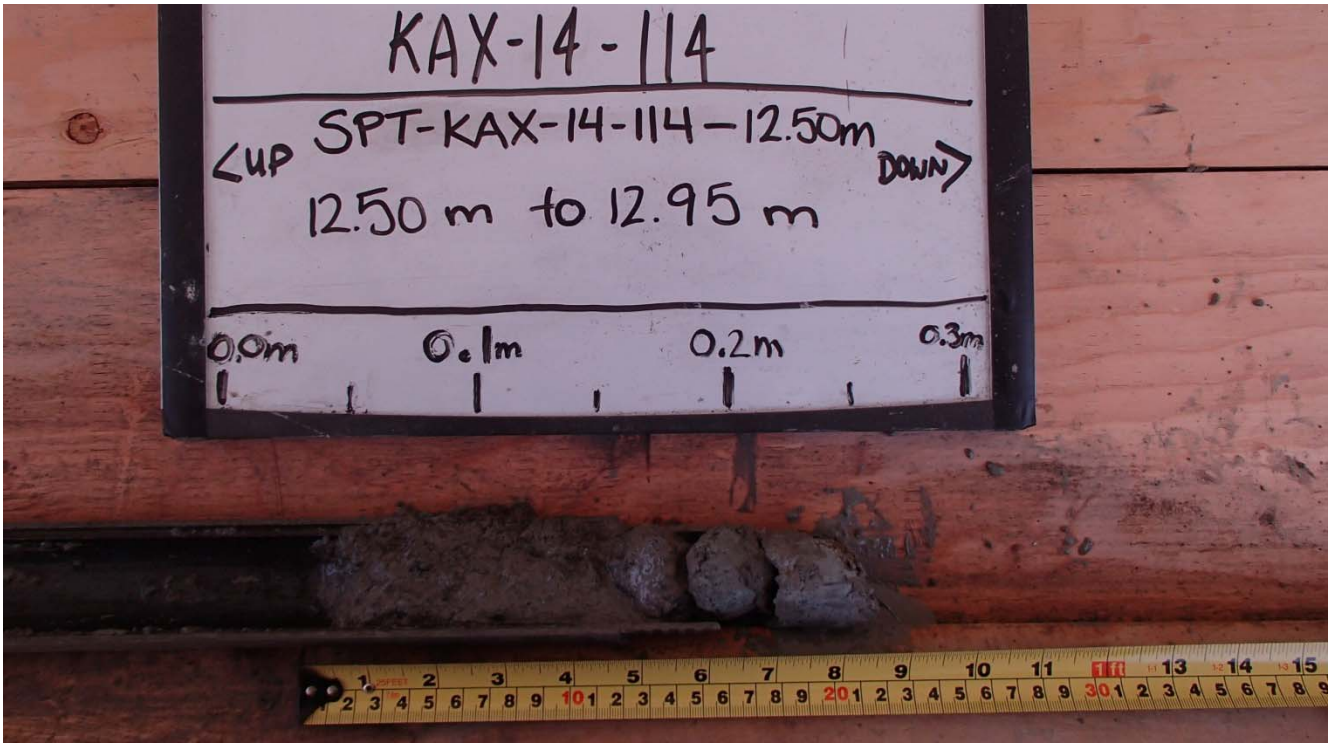


Photo II-81 KAX-14-114 SPT-KAX-14-114-12.5 m

Photo II-82 KAX-14-114 SPT-KAX-14-114-14.0 m

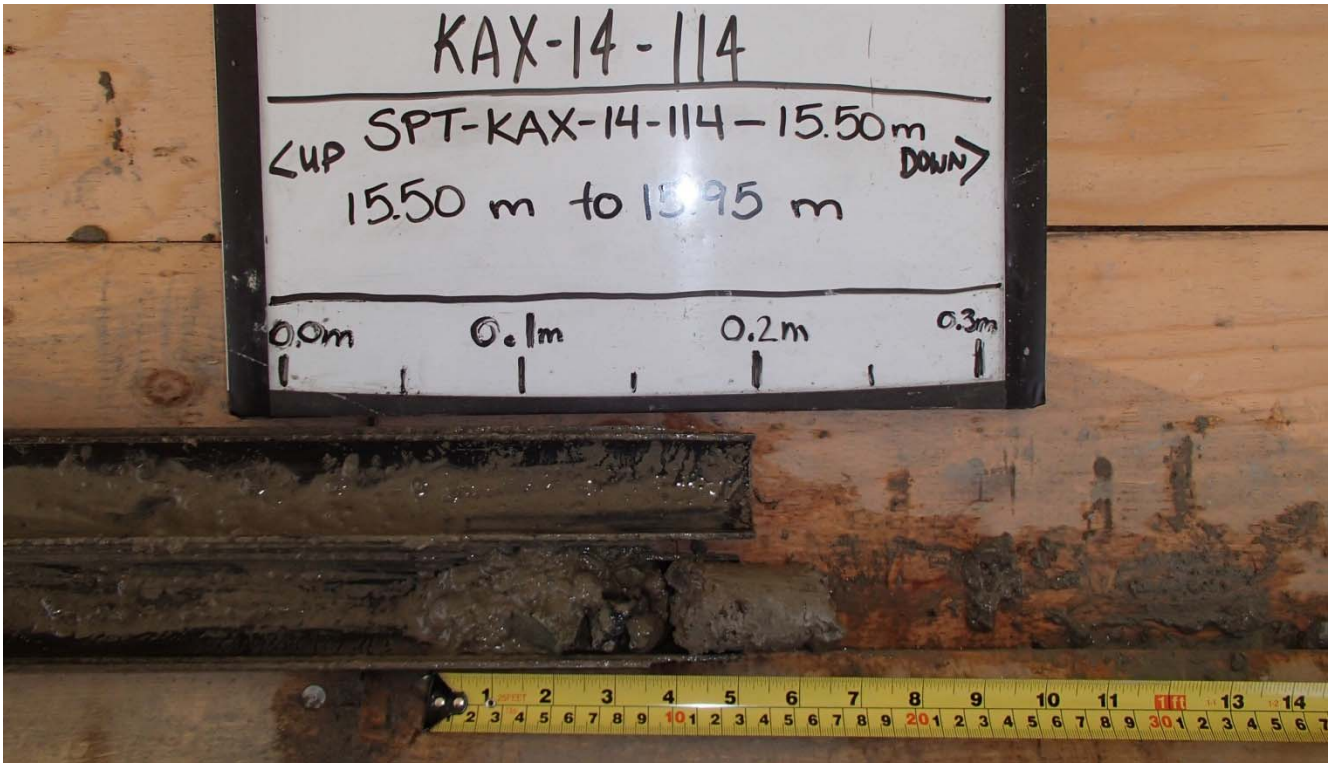


Photo II-83 KAX-14-114 SPT-KAX-14-114-15.5 m

Photo II-84 KAX-14-114 SPT-KAX-14-114-17.0 m

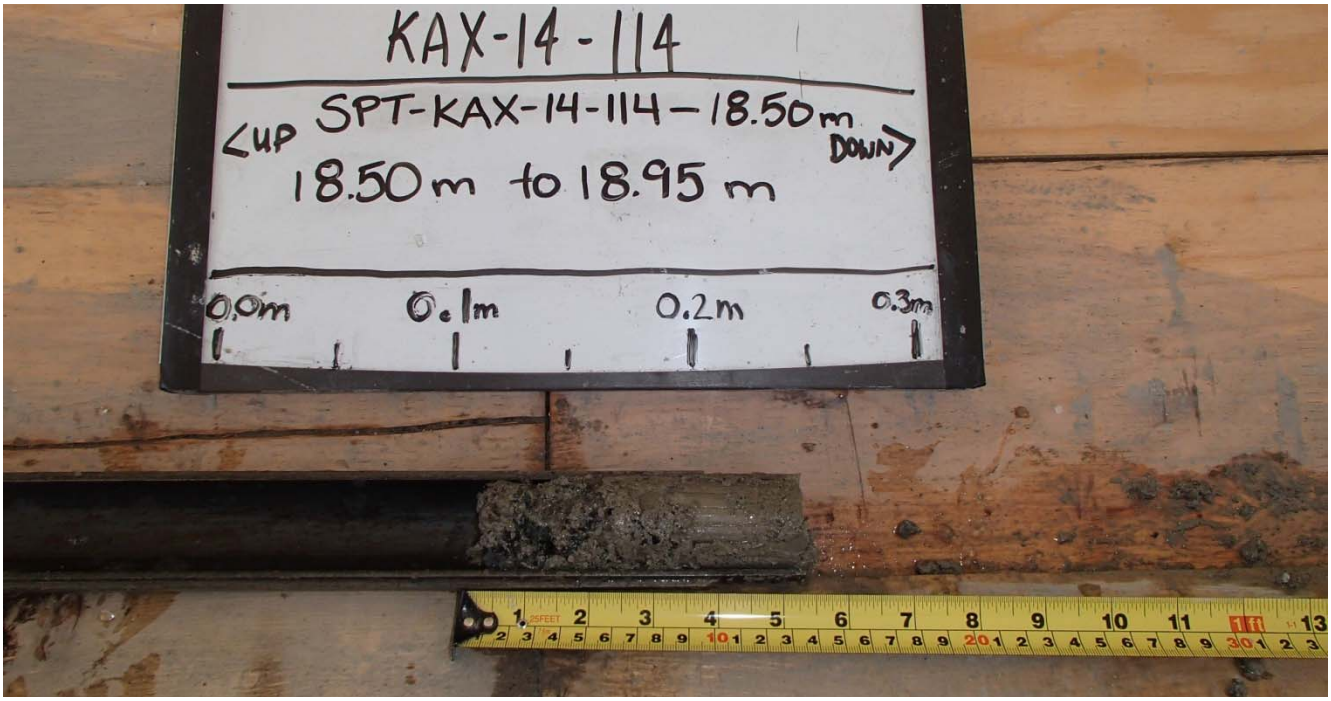


Photo II-85 KAX-14-114 SPT-KAX-14-114-18.5 m

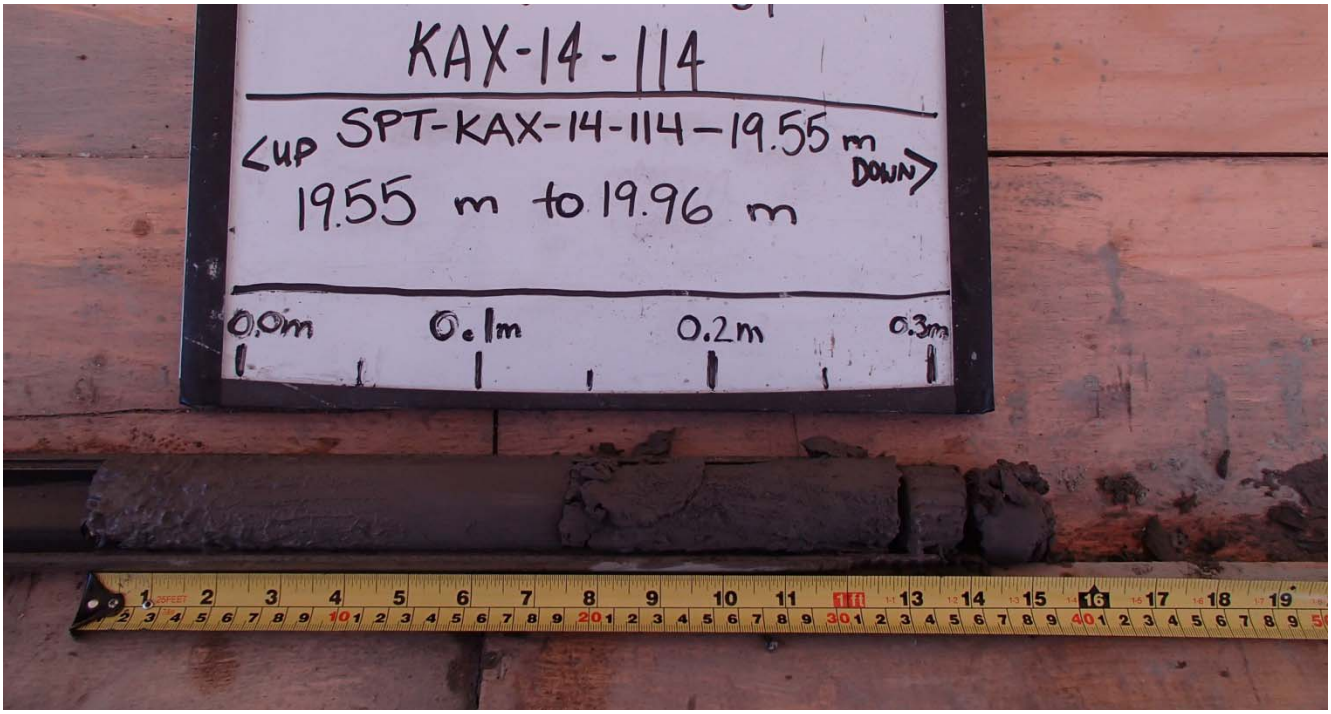


Photo II-86 KAX-14-114 SPT-KAX-14-114-19.5 m

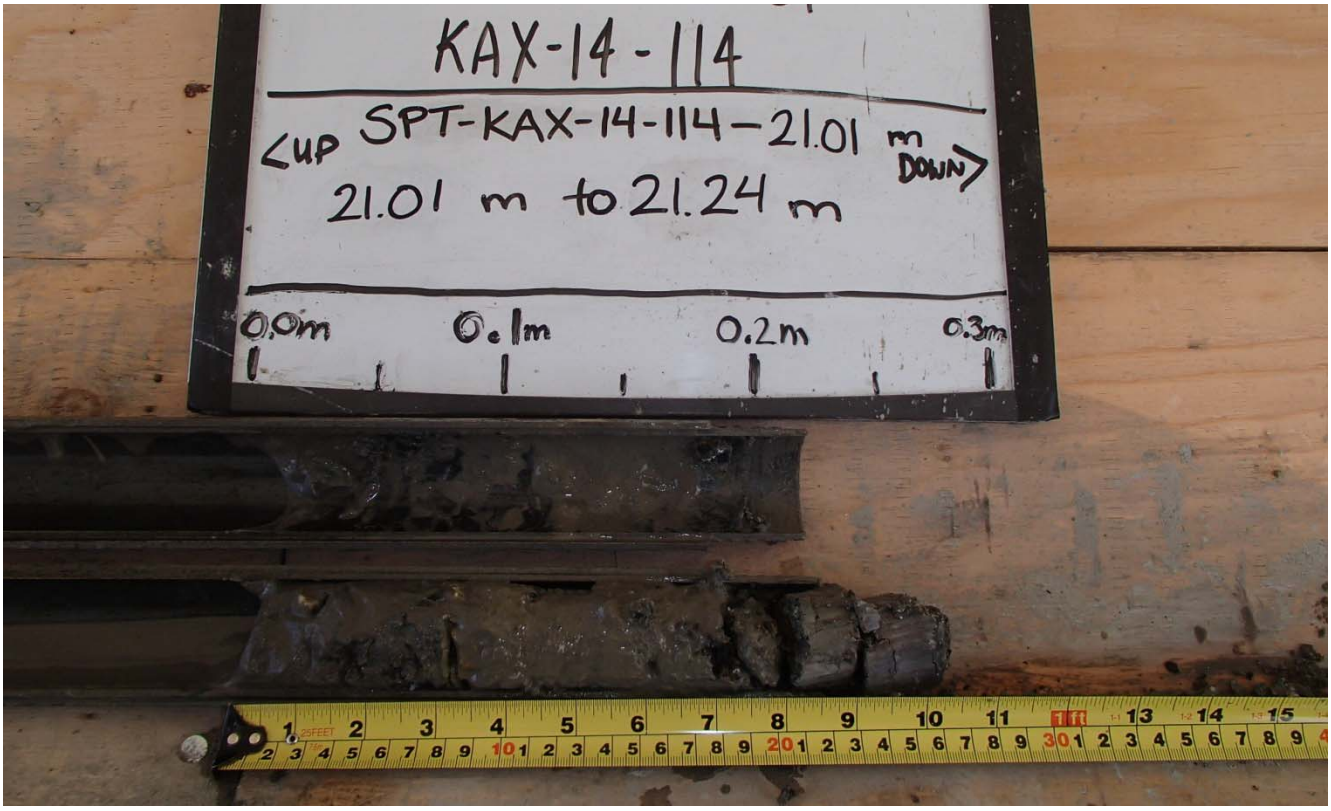


Photo II-87 KAX-14-114 SPT-KAX-14-114-21.0 m

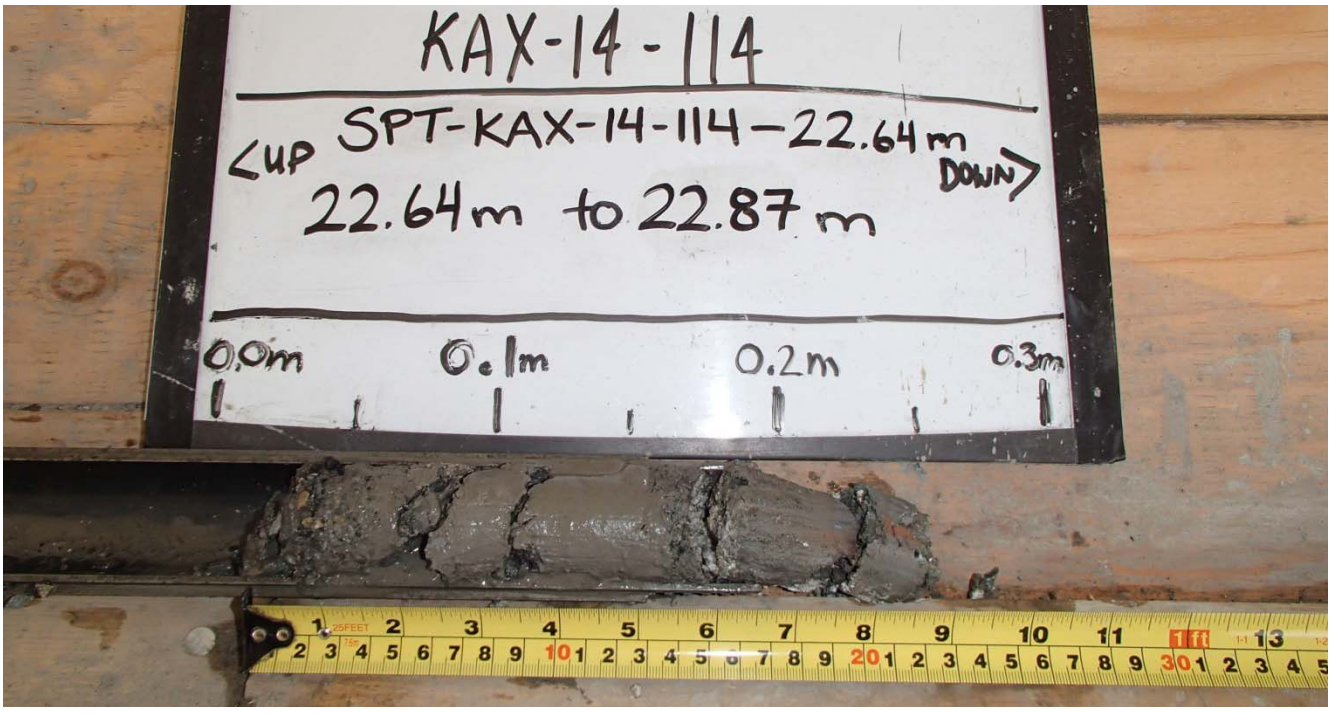


Photo II-88 KAX-14-114 SPT-KAX-14-114-22.6 m

Photo II-89 KAX-14-114 SPT-KAX-14-114-24.1 m

Photo II-90 KAX-14-114 SPT-KAX-14-114-25.6 m

Photo II-91 KAX-14-114 SPT-KAX-14-114-27.2 m

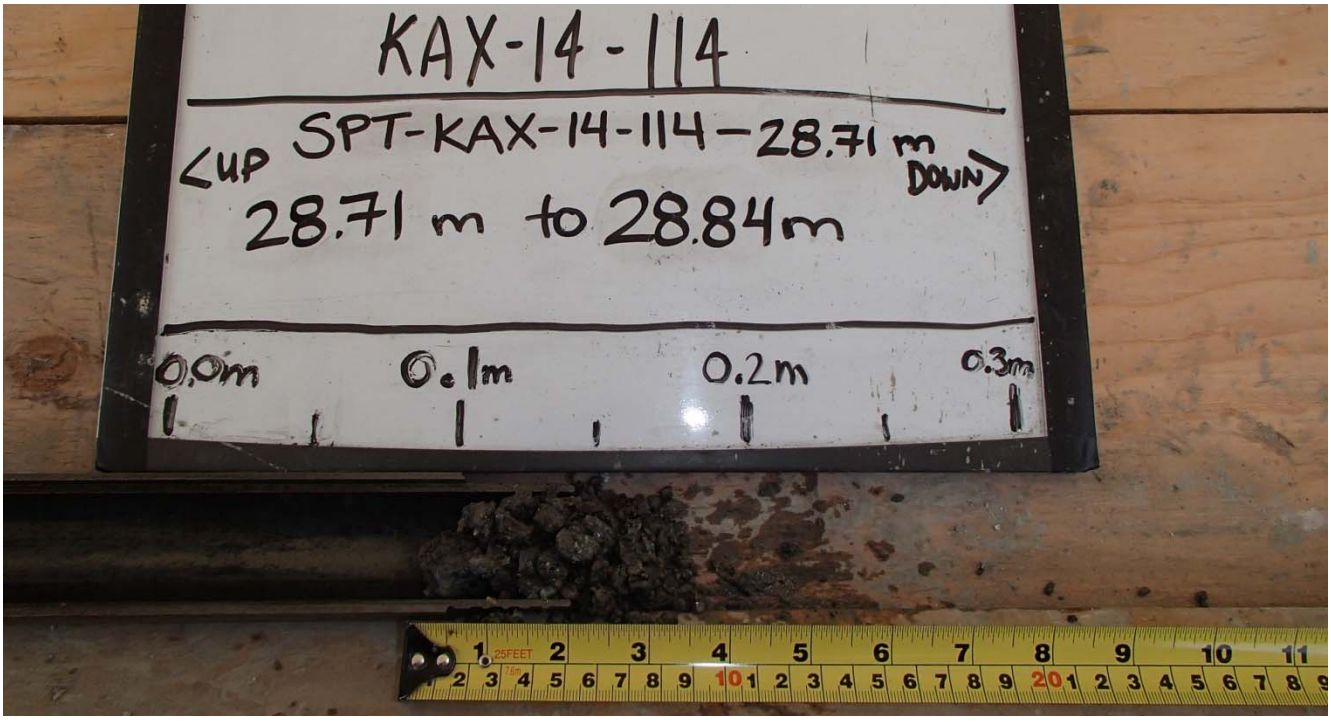


Photo II-92 KAX-14-114 SPT-KAX-14-114-28.7 m

No recovery at 30.2 m

No recovery at 31.7 m

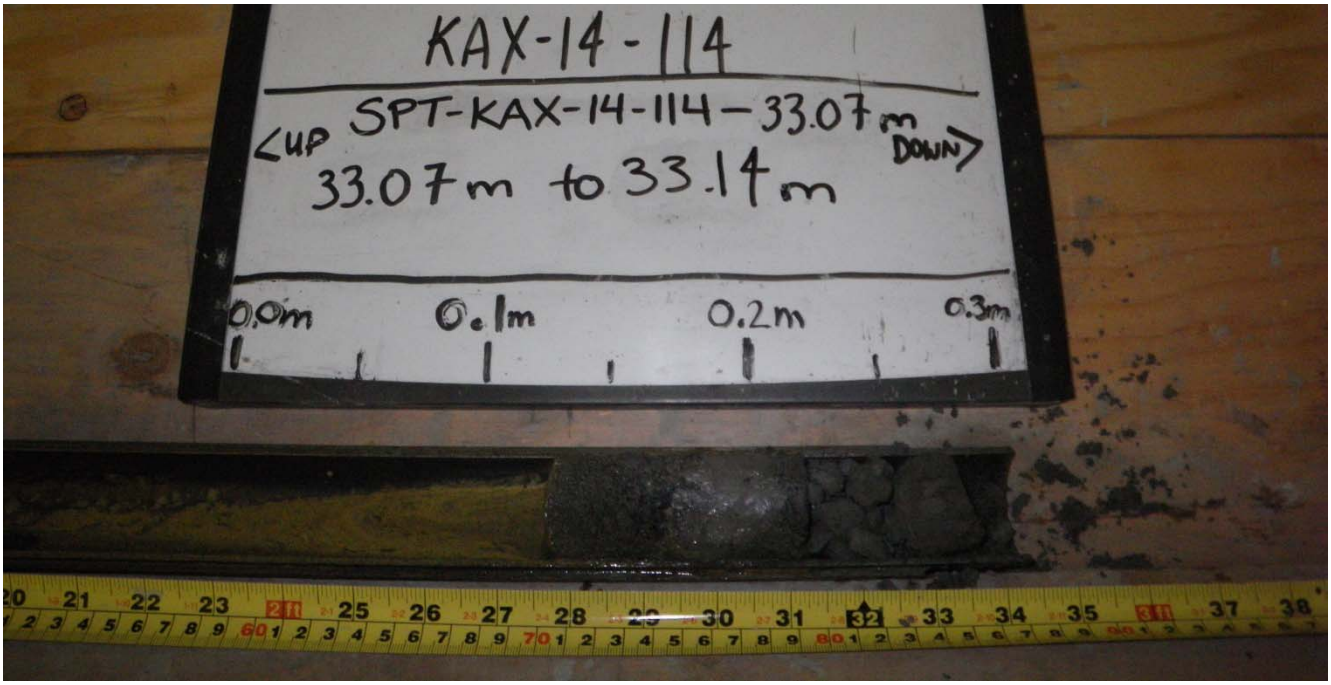


Photo II-93 KAX-14-114 SPT-KAX-14-114-33.1 m

No recovery at 34.6 m

Photo II-94 KAX-14-114 Boxes 1 to 2 0.0 m to 18.5 m

Changed drill method from PQ3 coring to ODEX between 18.5 m and 38.0 m. ODEX cuttings were not stored in core boxes.

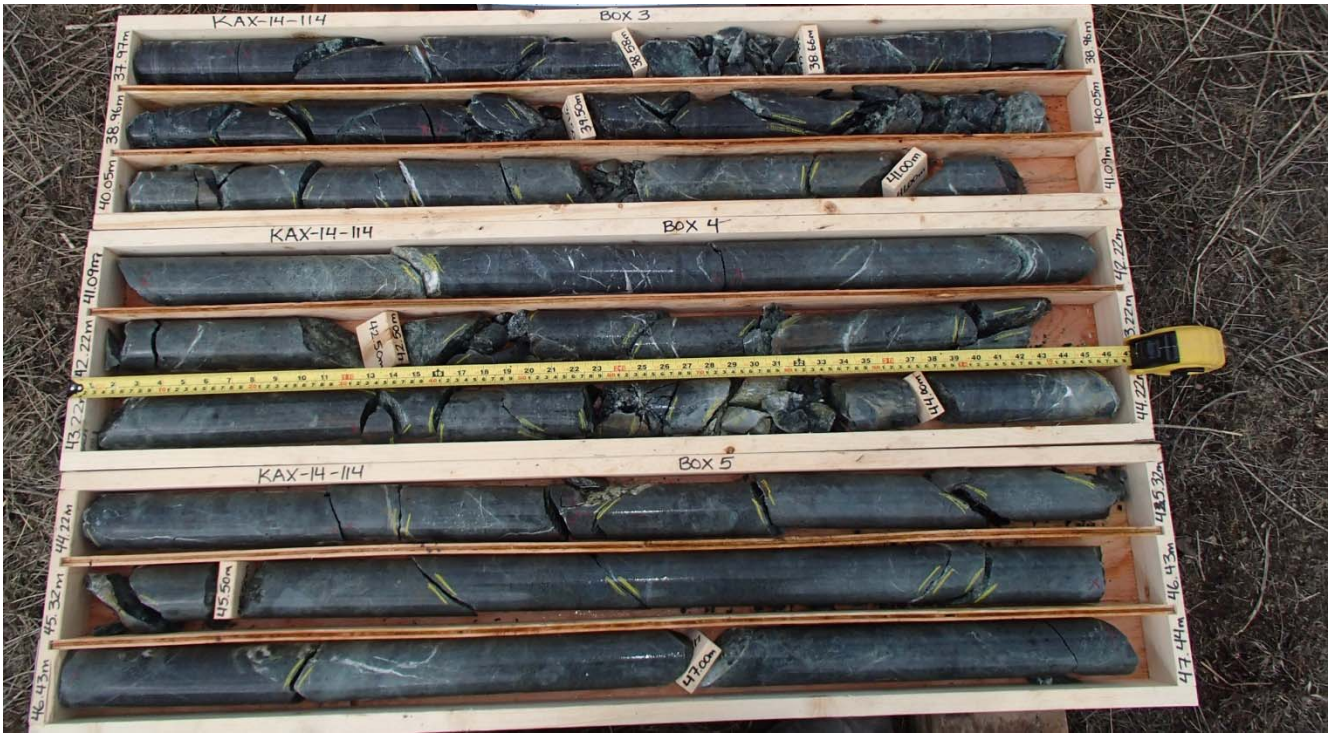


Photo II-95 KAX-14-114 Boxes 3 to 5 38.0 m to 47.4 m

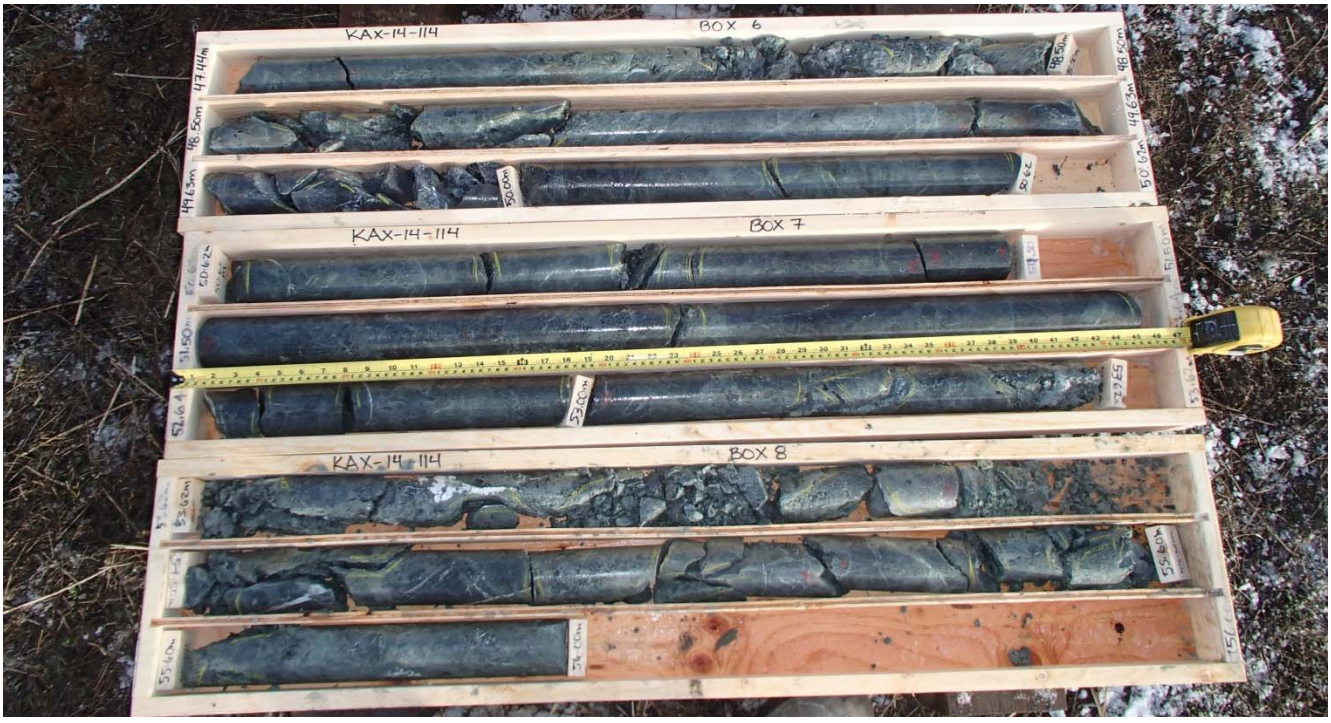


Photo II-96 KAX-14-114 Boxes 6 to 8 47.4 m to 56.0 m

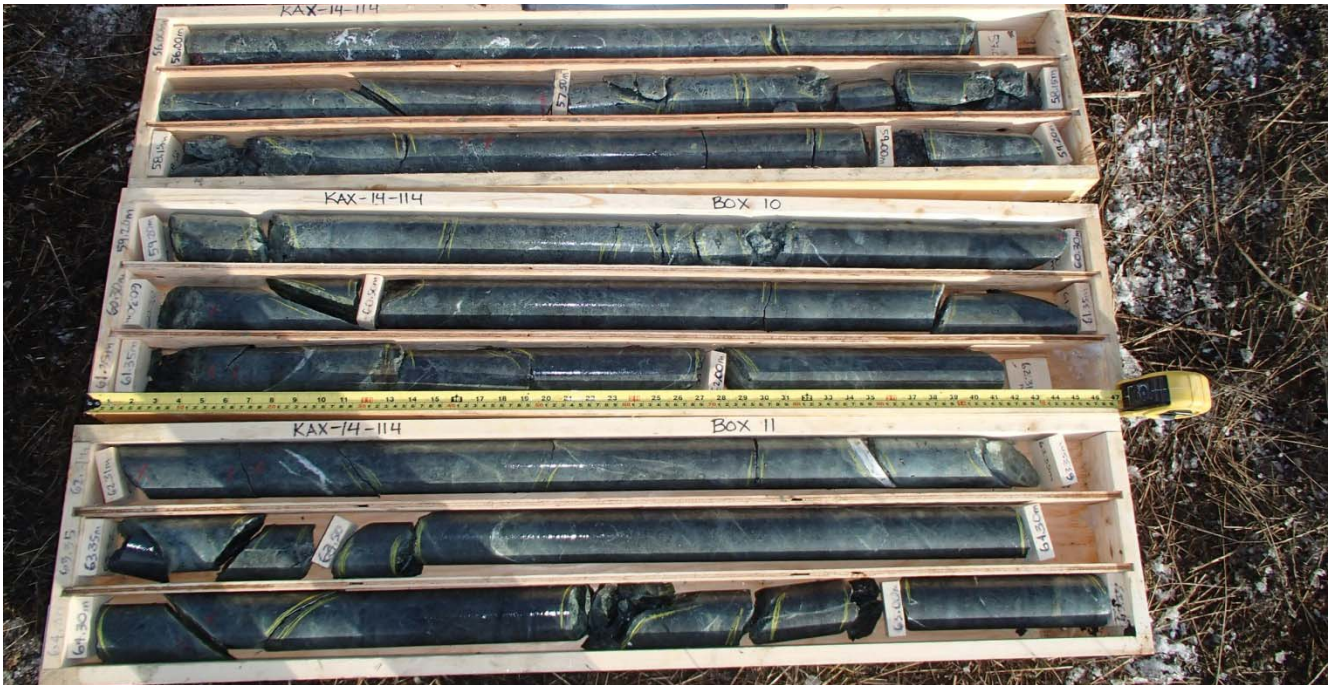


Photo II-97 KAX-14-114 Boxes 9 to 11 56.0 m to 65.2 m

Photo II-98 KAX-14-114 Boxes 12 to 14 65.2 m to 74.3 m

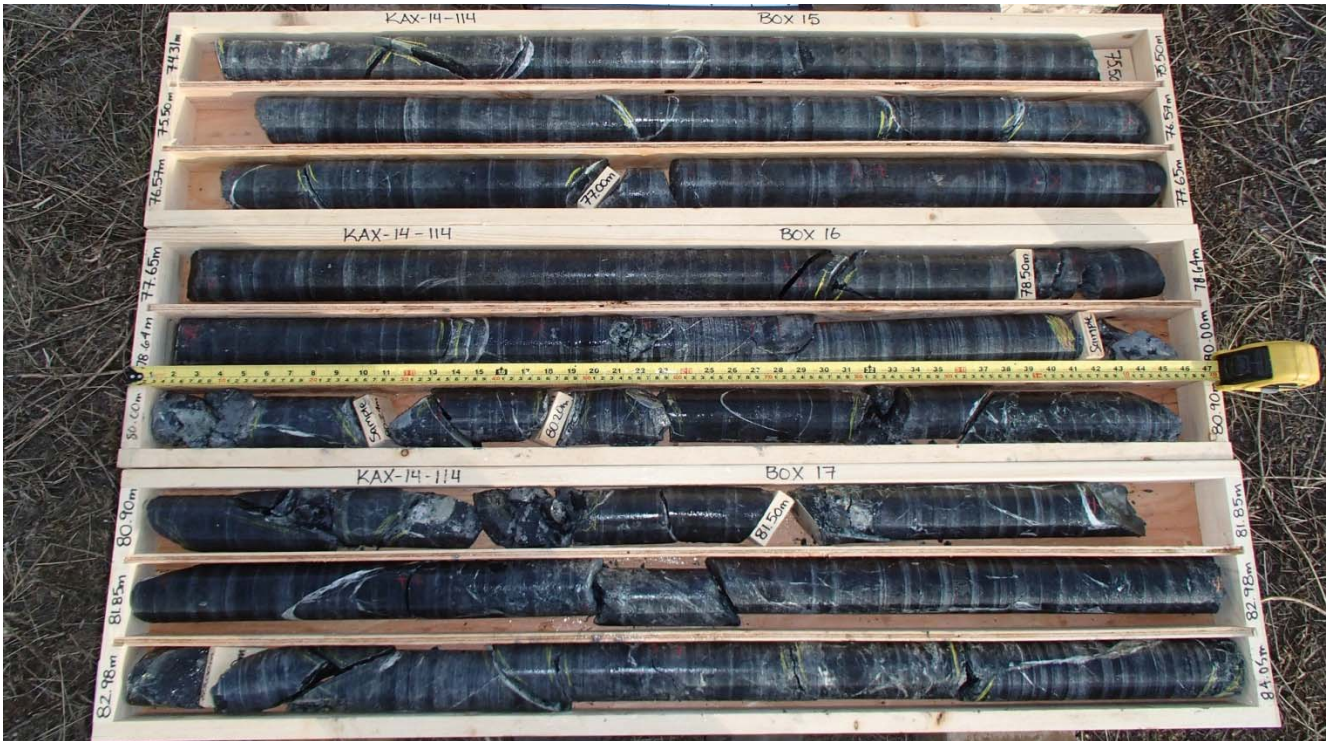


Photo II-99 KAX-14-114 Boxes 15 to 17 74.3 m to 84.0 m

Photo II-100 KAX-14-114 Boxes 18 to 20 84.0 m to 93.5 m

Photo II-101 KAX-14-114 Boxes 21 to 23 93.5 m to 103.2 m

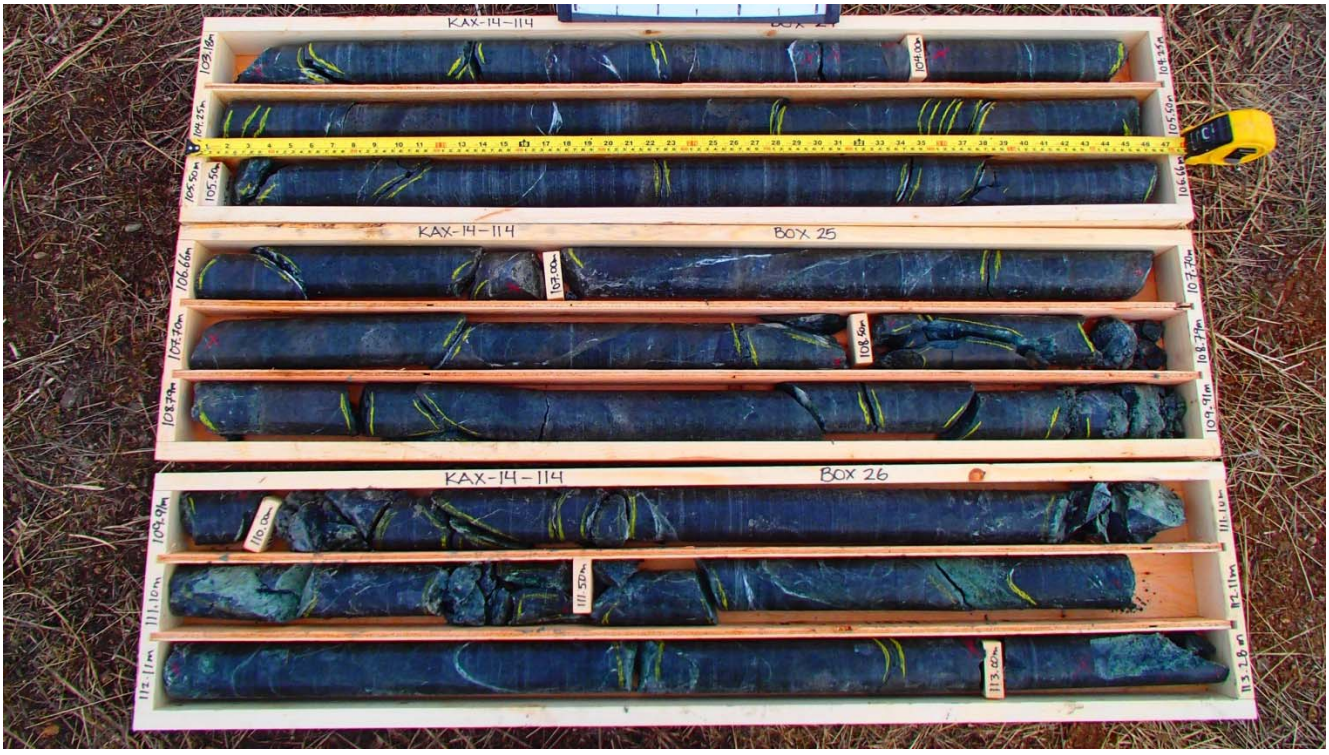


Photo II-102 KAX-14-114 Boxes 24 to 26 103.2 m to 113.3 m

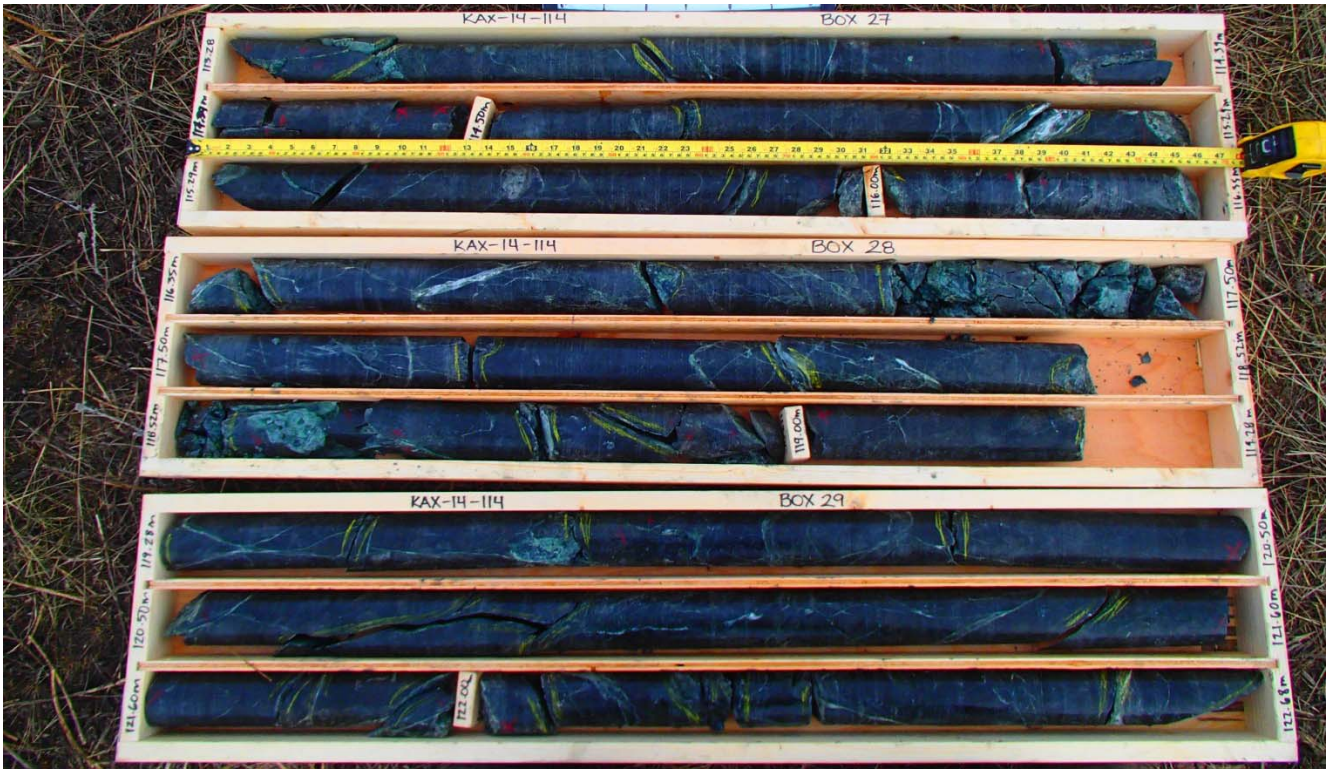


Photo II-103 KAX-14-114 Boxes 27 to 29 113.3 m to 122.7 m

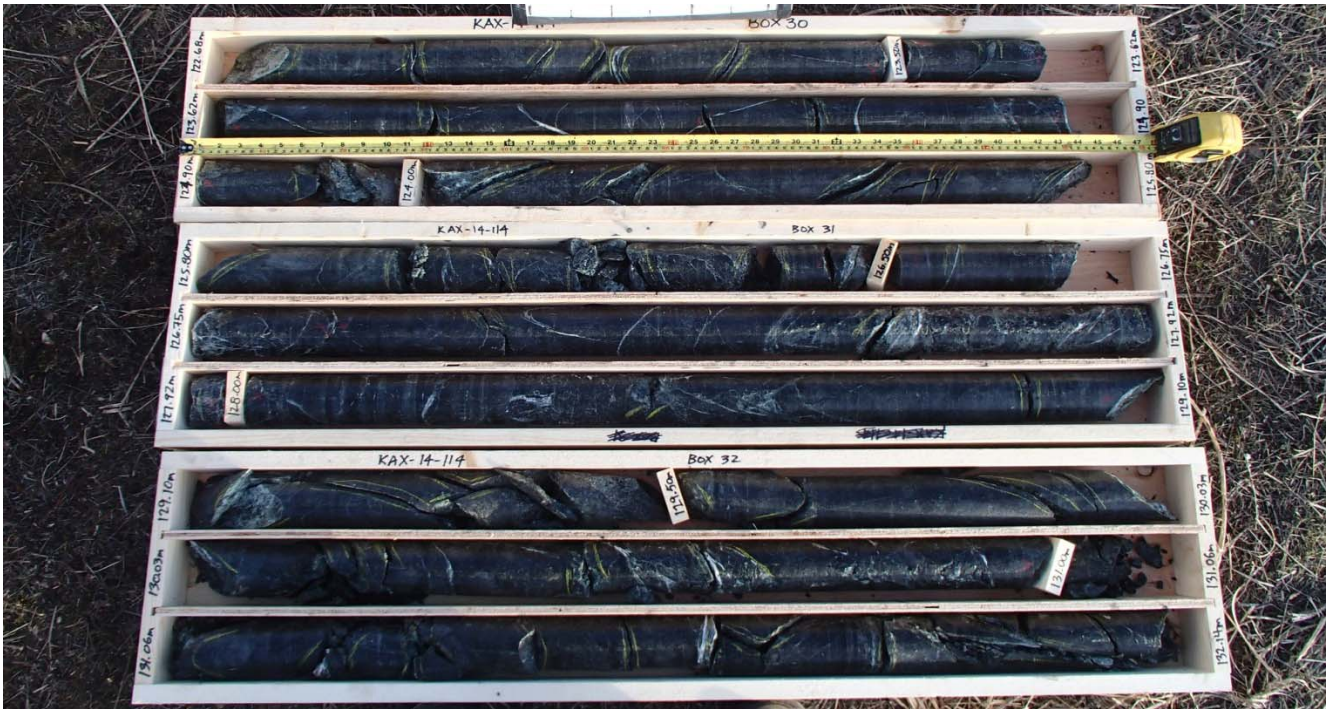


Photo II-104 KAX-14-114 Boxes 30 to 32 122.7 m to 132.1 m

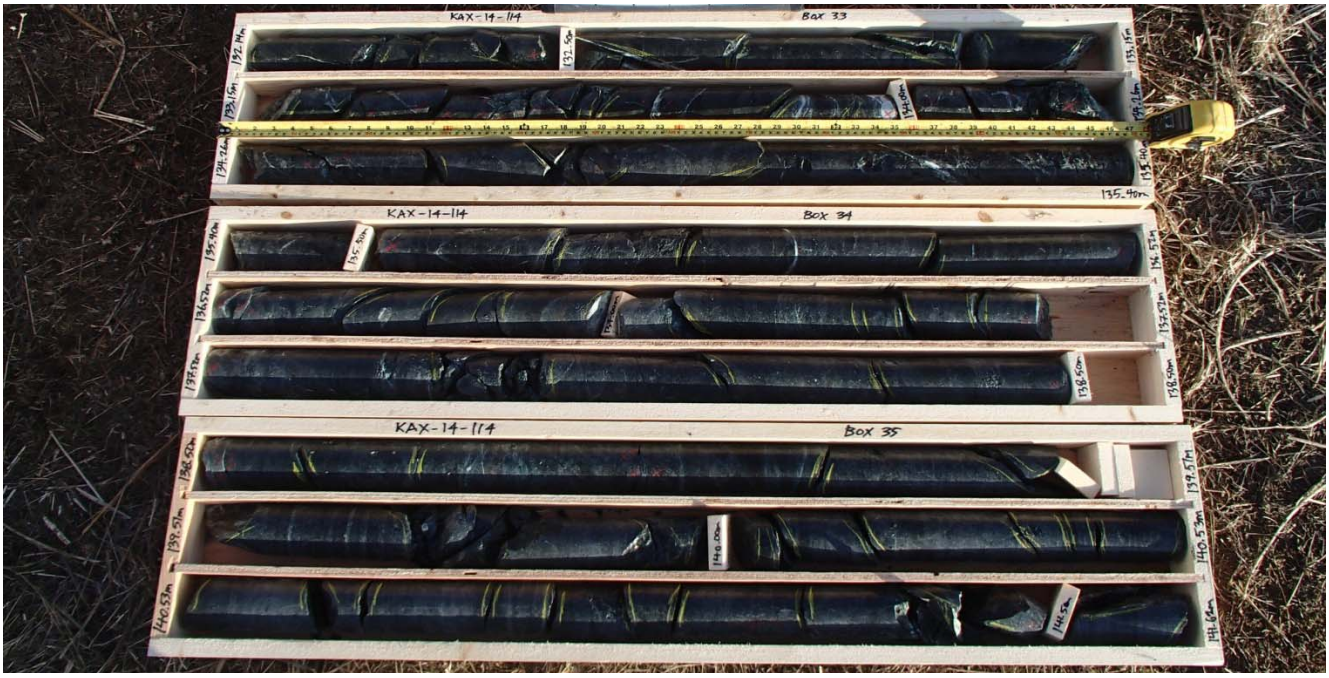


Photo II-105 KAX-14-114 Boxes 33 to 35 132.1 m to 141.6 m

Photo II-106 KAX-14-114 Boxes 36 to 39 141.6 m to 152.0 m

KAX-14-121

No SPTs conducted at KAX-14-121.

Photo II-107 KAX-14-121 Boxes 1 to 3 0.0 m to 18.3 m

Photo II-108 KAX-14-121 Boxes 4 to 6 18.3 m to 30.8 m

Photo II-109 KAX-14-121 Boxes 7 to 9 30.8 m to 40.5 m

Photo II-110 KAX-14-121 Boxes 10 to 12 40.5 m to 51.9 m

Photo II-111 KAX-14-121 Boxes 13 to 15 51.9 m to 62.9 m

Photo II-112 KAX-14-121 Boxes 16 to 18 62.9 m to 72.2 m

Photo II-113 KAX-14-121 Boxes 19 to 21 72.2 m to 82.2 m

Photo II-114 KAX-14-121 Boxes 22 to 24 82.2 m to 92.6 m

Photo II-115 KAX-14-121 Boxes 25 to 27 92.6 m to 102.2 m

Photo II-116 KAX-14-121 Boxes 28 to 30 102.2 m to 111.6 m

Photo II-117 KAX-14-121 Boxes 31 to 33 111.6 m to 121.1 m

Photo II-118 KAX-14-121 Boxes 34 to 36 121.1 m to 130.4 m

Photo II-119 KAX-14-121 Boxes 37 to 39 130.4 m to 139.7 m

Photo II-120 KAX-14-121 Boxes 40 to 42 139.7 m to 149.3 m

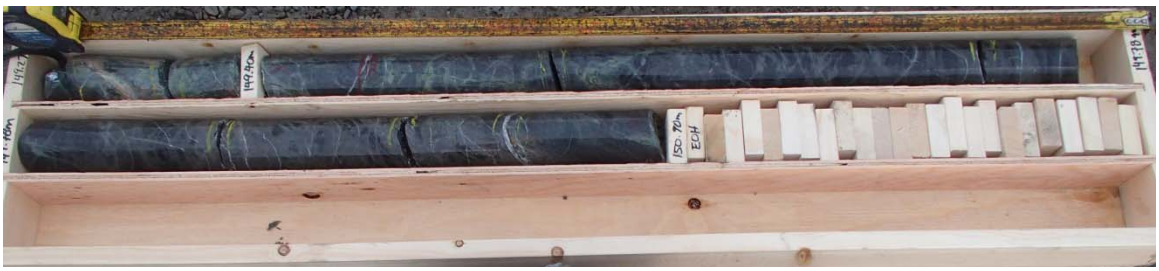


Photo II-121 KAX-14-121 Box 43 149.3 m to 150.9 m

KAX-14-125

No SPTs conducted at KAX-14-125.

Photo II-122 KAX-14-125 Boxes 1 to 4 0.0 m to 32.5 m

Photo II-123 KAX-14-125 Boxes 5 to 8 32.5 m to 45.2 m

Photo II-124 KAX-14-125 Boxes 9 to 12 45.2 m to 61.0 m

KAX-14-128

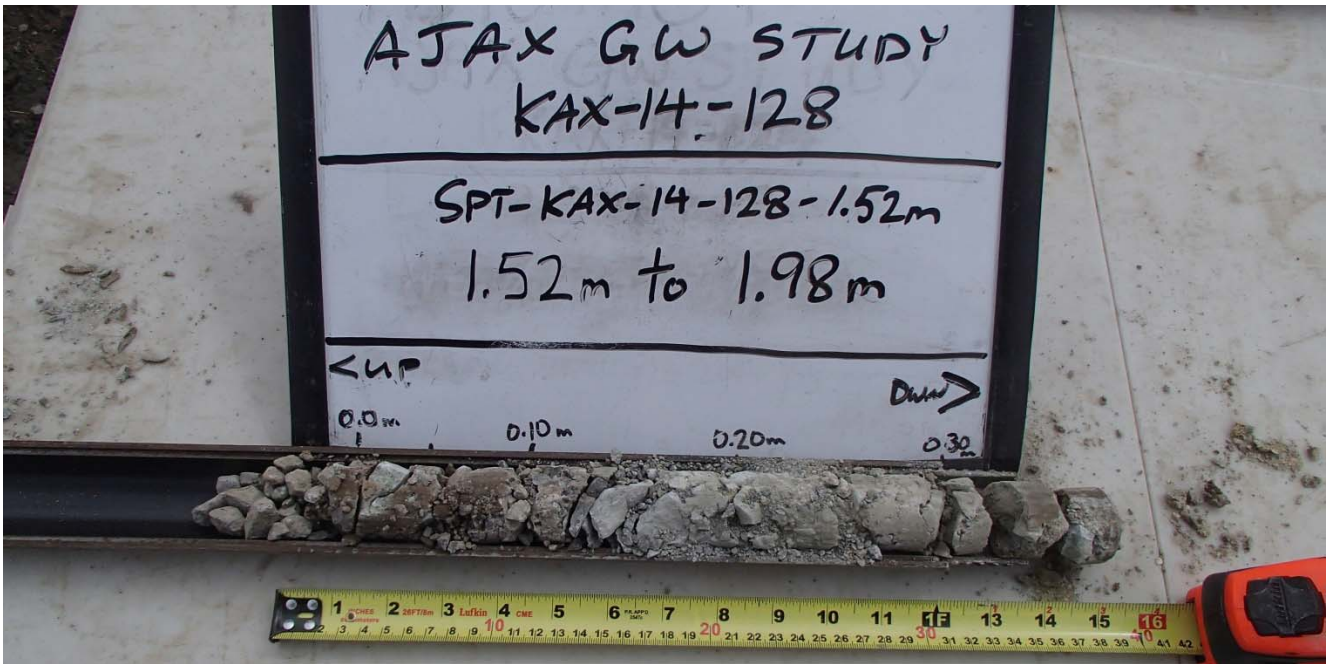


Photo II-125 KAX-14-128 SPT-KAX-14-128-1.5 m

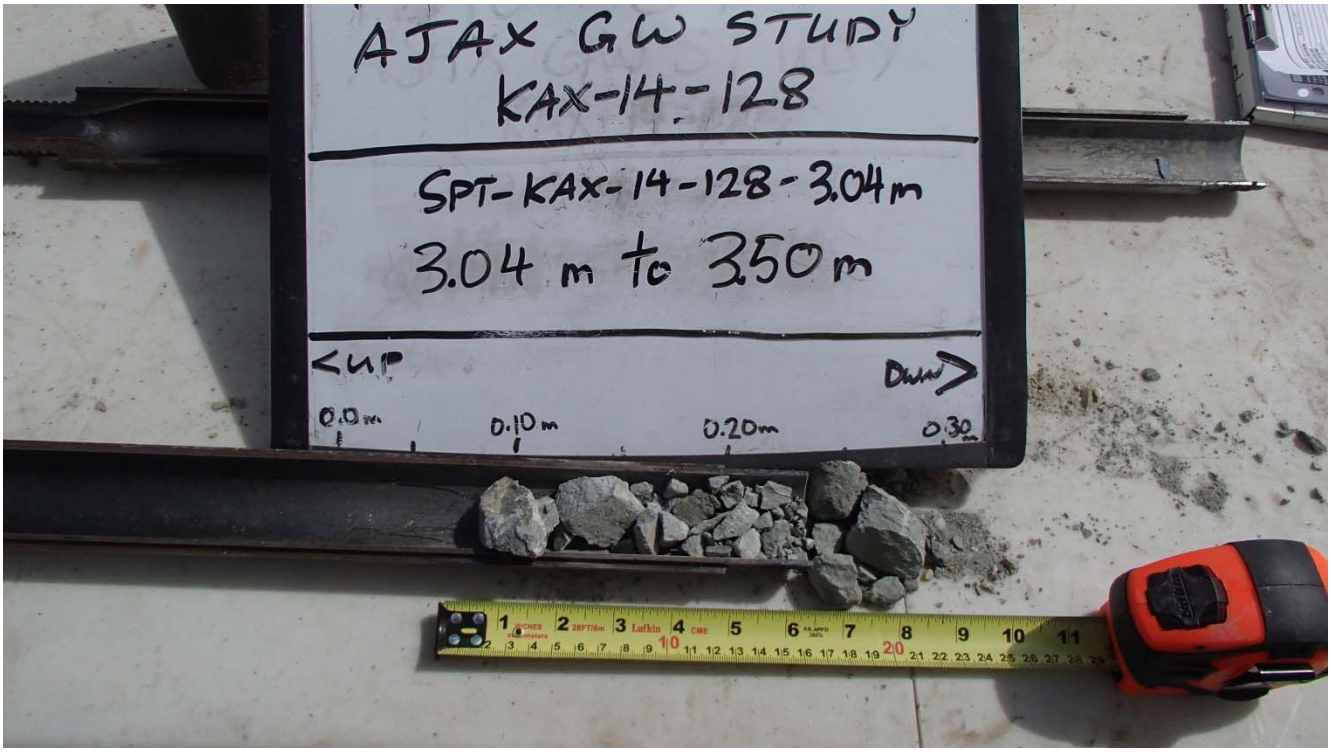


Photo II-126 KAX-14-128 SPT-KAX-14-128-3.0 m

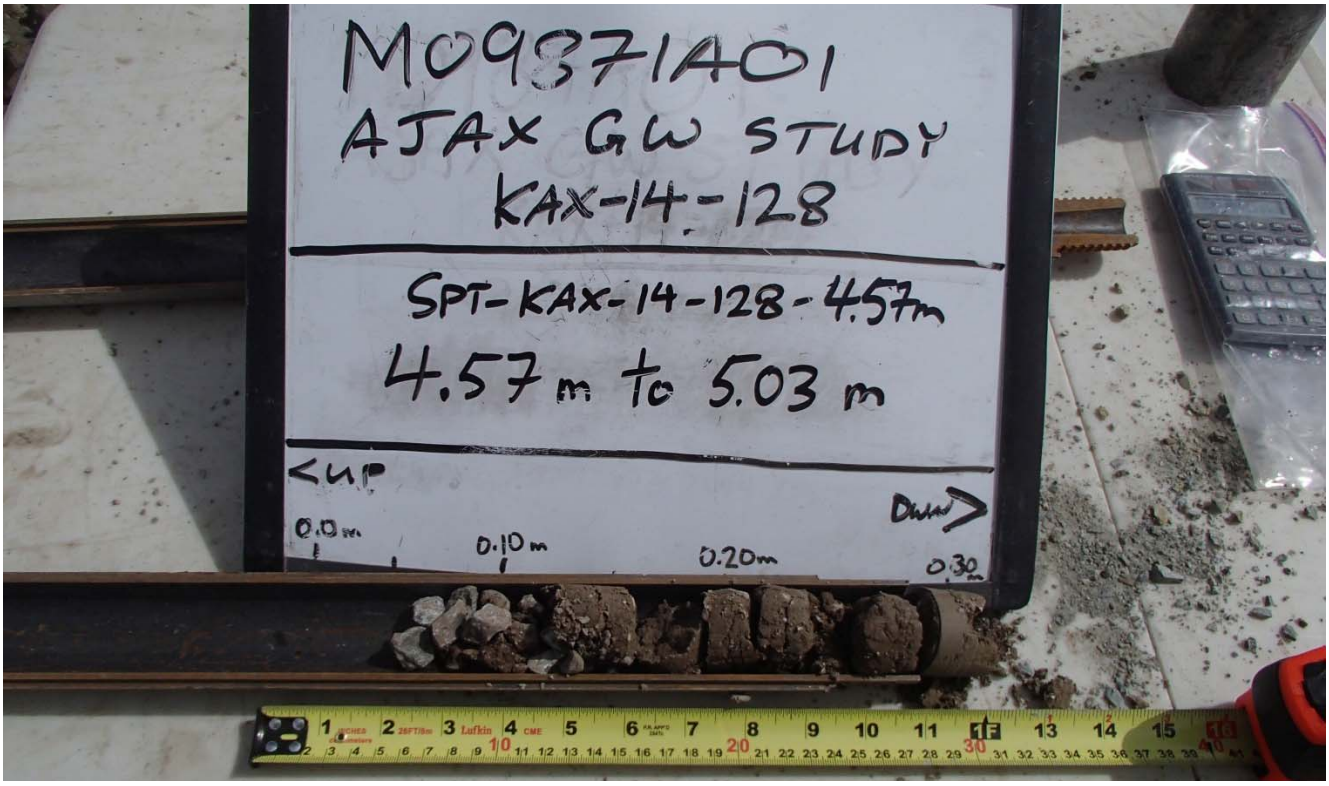


Photo II-127 KAX-14-128 SPT-KAX-14-128-4.6 m

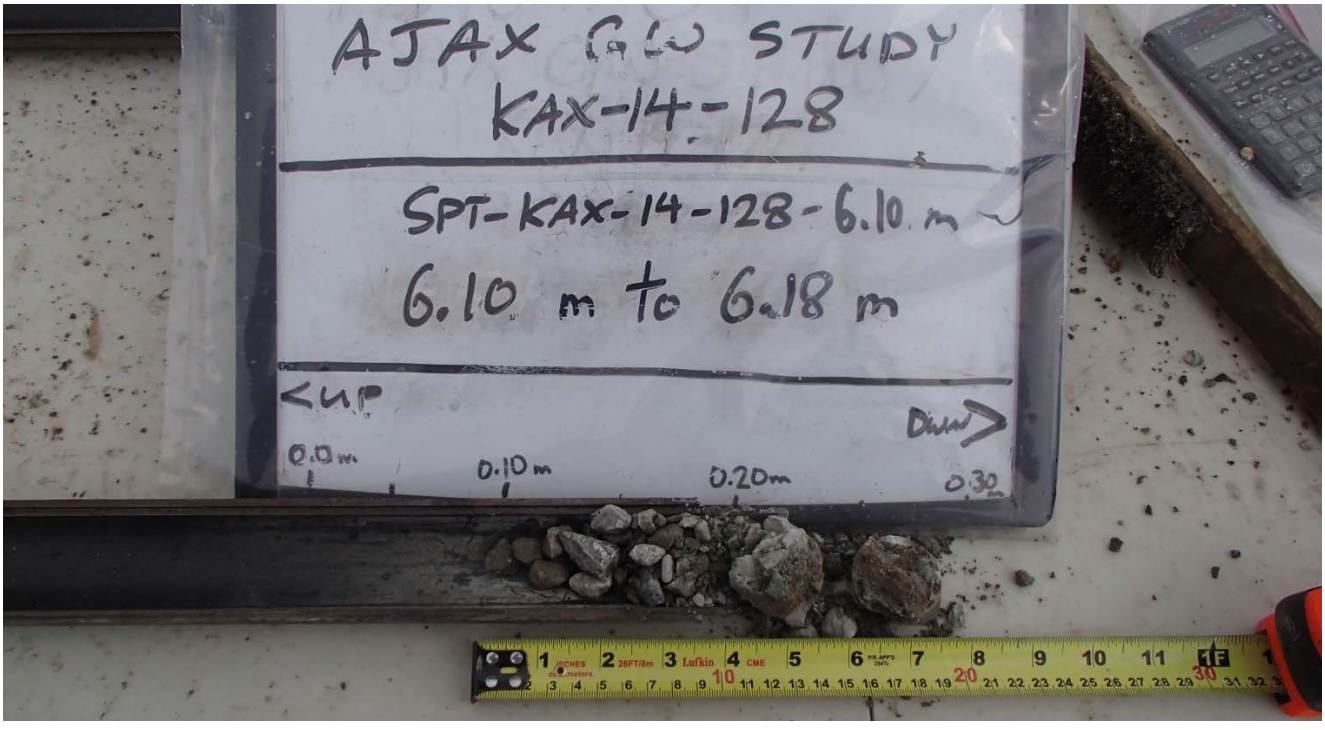


Photo II-128 KAX-14-128 SPT-KAX-14-128-6.1 m

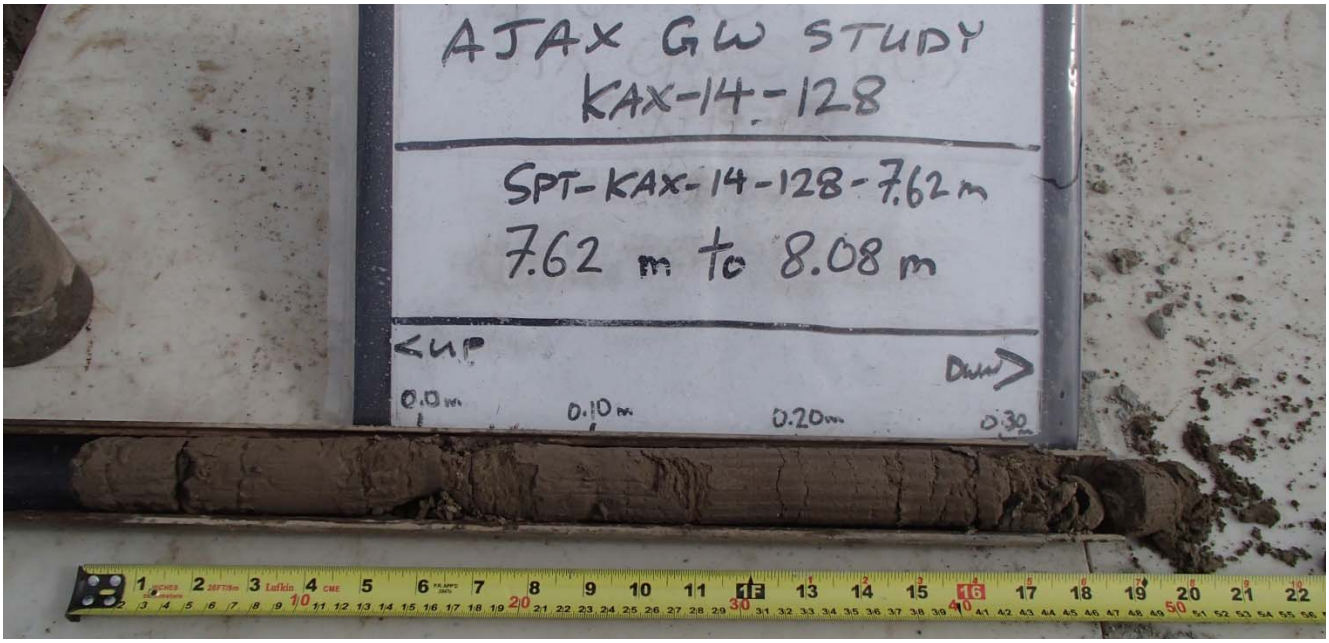


Photo II-129 KAX-14-128 SPT-KAX-14-128-7.6 m

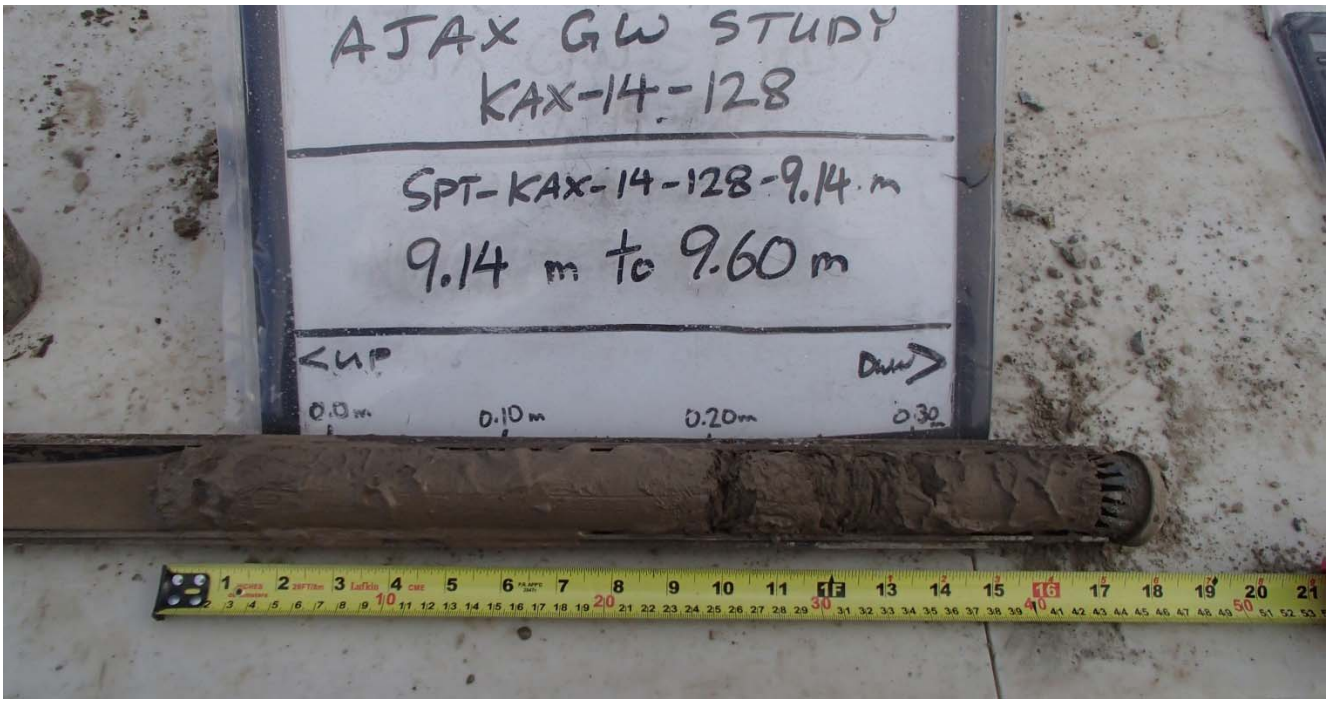


Photo II-130 KAX-14-128 SPT-KAX-14-128-9.1 m

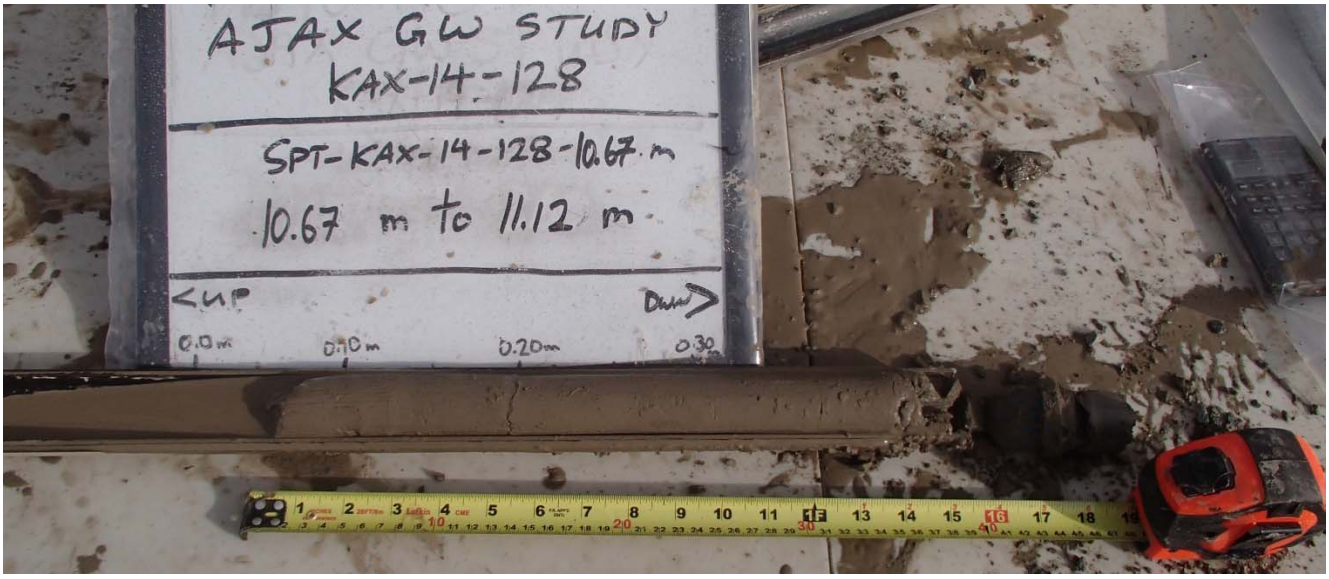


Photo II-131 KAX-14-128 SPT-KAX-14-128-11.1 m

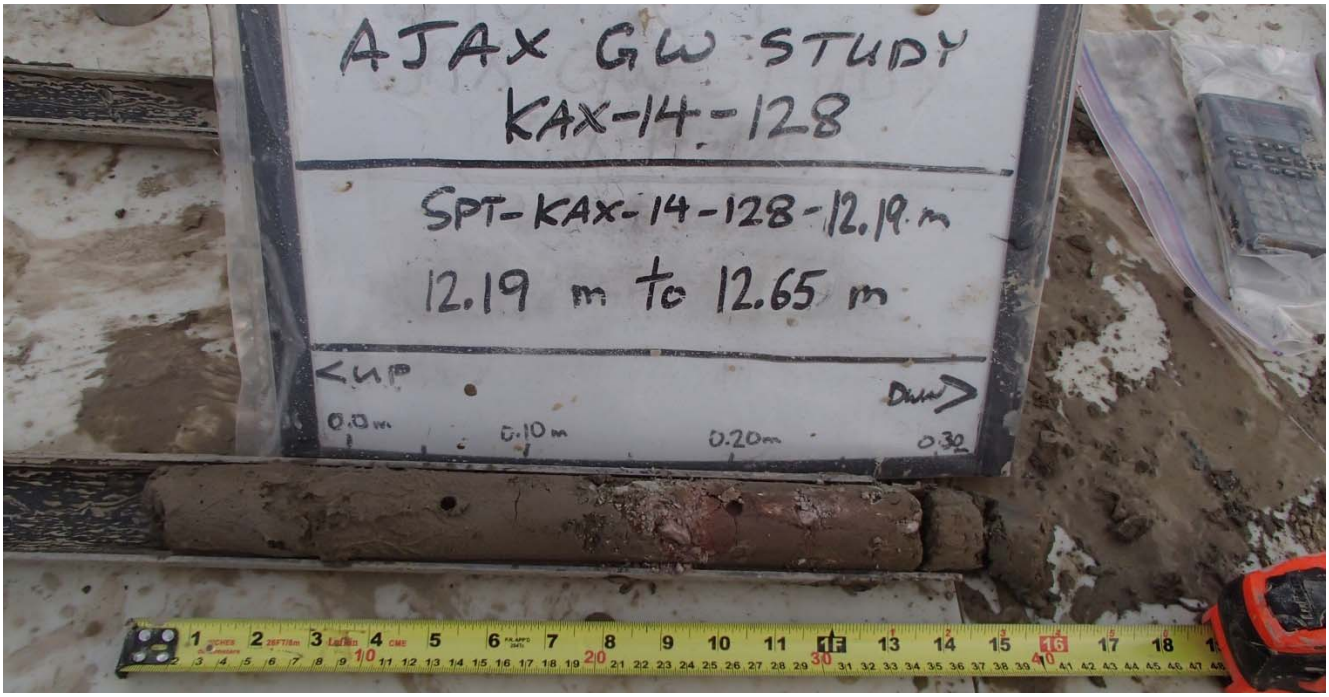


Photo II-132 KAX-14-128 SPT-KAX-14-128-12.2 m

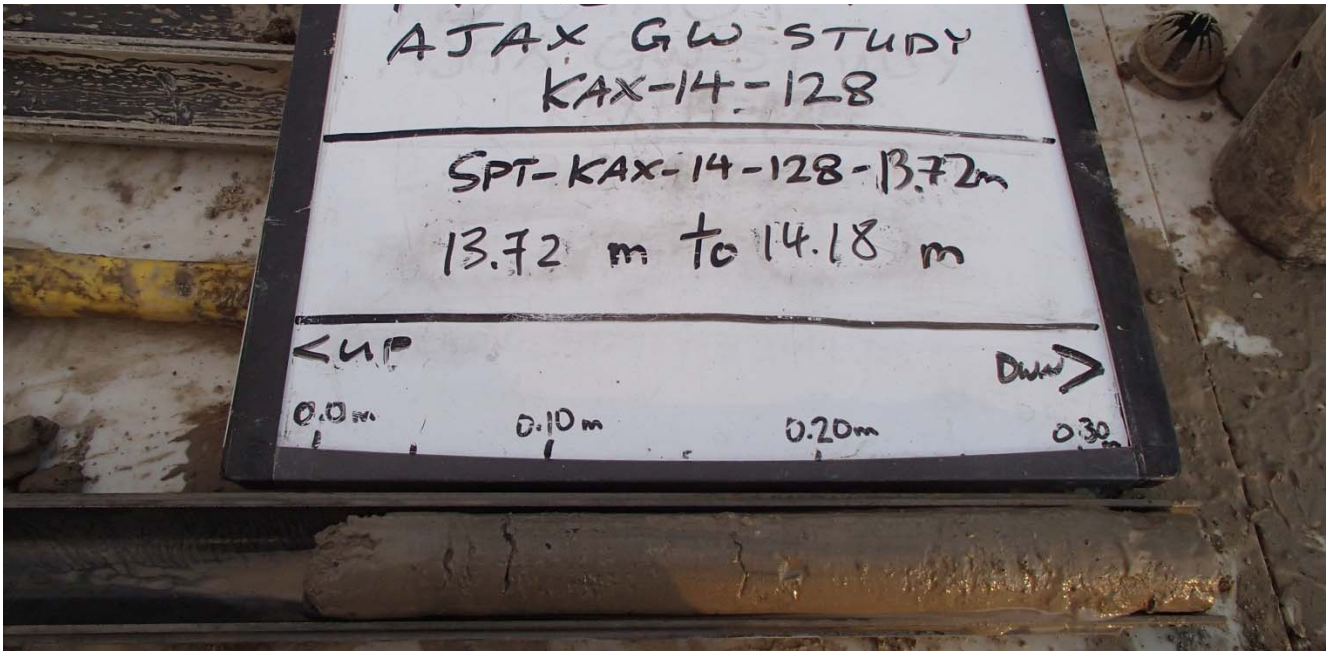


Photo II-133 KAX-14-128 SPT-KAX-14-128-13.7 m

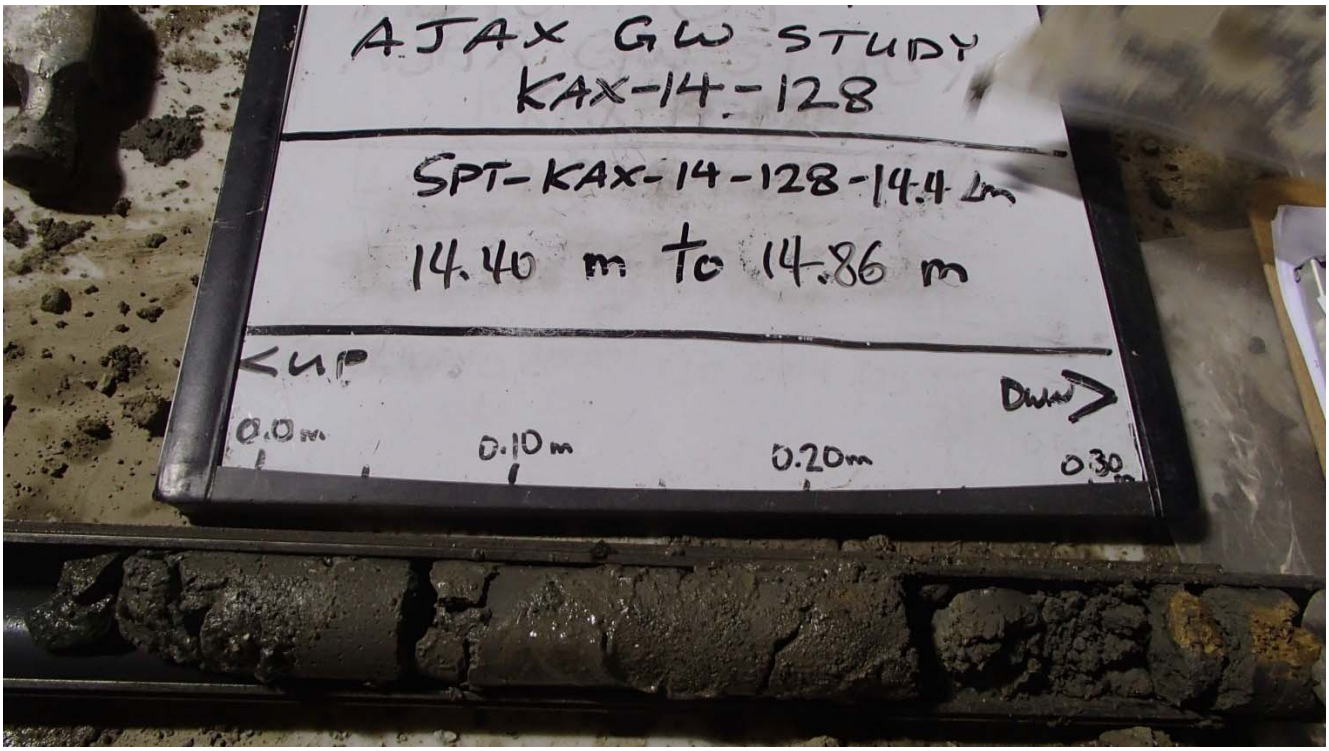


Photo II-134 KAX-14-128 SPT-KAX-14-128-14.4 m

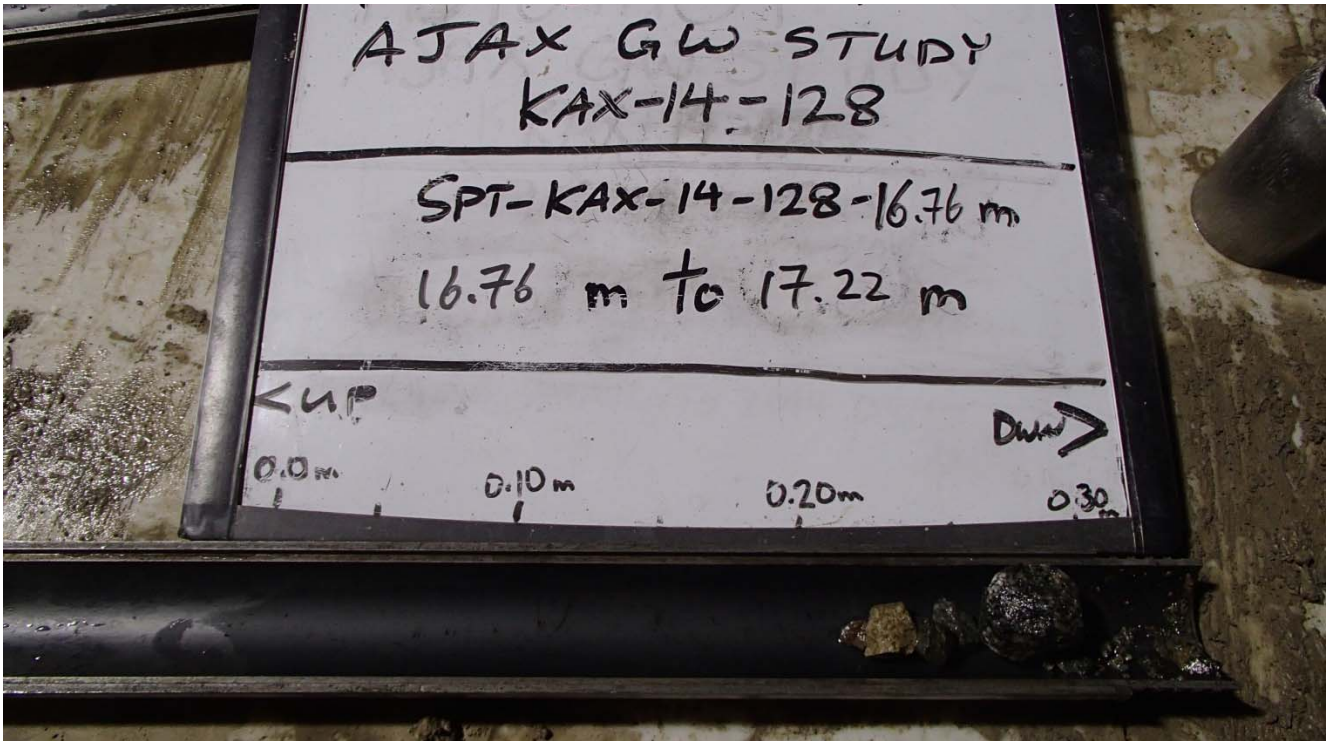


Photo II-135 KAX-14-128 SPT-KAX-14-128-16.8 m

Photo II 136 KAX-14-128 Boxes 1 to 4 17.8 m to 32.5 m

Photo II 137 KAX-14-128 Boxes 5 to 8 32.5 m to 45.7 m

Photo II 138 KAX-14-128 Boxes 9 to 12 45.7 m to 58.5 m

Photo II 139 KAX-14-128 Boxes 13 to 16 58.5 m to 70.5 m

Photo II 140 KAX-14-128 Boxes 17 to 20 70.5 m to 85.9 m

Photo II 141 KAX-14-128 Boxes 21 to 24 85.9 m to 99.3 m

Photo II 142 KAX-14-128 Boxes 25 to 28 99.3 m to 112.0 m

Photo II 143 KAX-14-128 Boxes 29 to 32 112.0 m to 123.8 m

Photo II 144 KAX-14-128 Boxes 33 to 35 123.8 m to 134.5 m

Photo II 145 KAX-14-128 Box 36 134.5 m to 135.8 m

KAX-14-130

Photo II 146 KAX-14-130 Boxes 1 to 4 0.0 m to 43.6 m

Photo II 147 KAX-14-130 Boxes 5 to 8 43.6 m to 56.0 m

Photo II 148 KAX-14-130 Boxes 9 to 12 56.0 m to 67.5 m

Photo II 149 KAX-14-130 Boxes 13 to 16 67.5 m to 82.0 m

Photo II 150 KAX-14-130 Boxes 17 to 20 82.0 m to 94.0 m

Photo II 151 KAX-14-130 Boxes 21 to 24 94.0 m to 106.8 m

Photo II 152 KAX-14-130 Boxes 25 to 28 106.8 m to 119.0 m

Photo II 153 KAX-14-130 Boxes 29 to 32 119.0 m to 130.7 m

Photo II 154 KAX-14-130 Boxes 33 to 36 130.7 m to 143.1 m

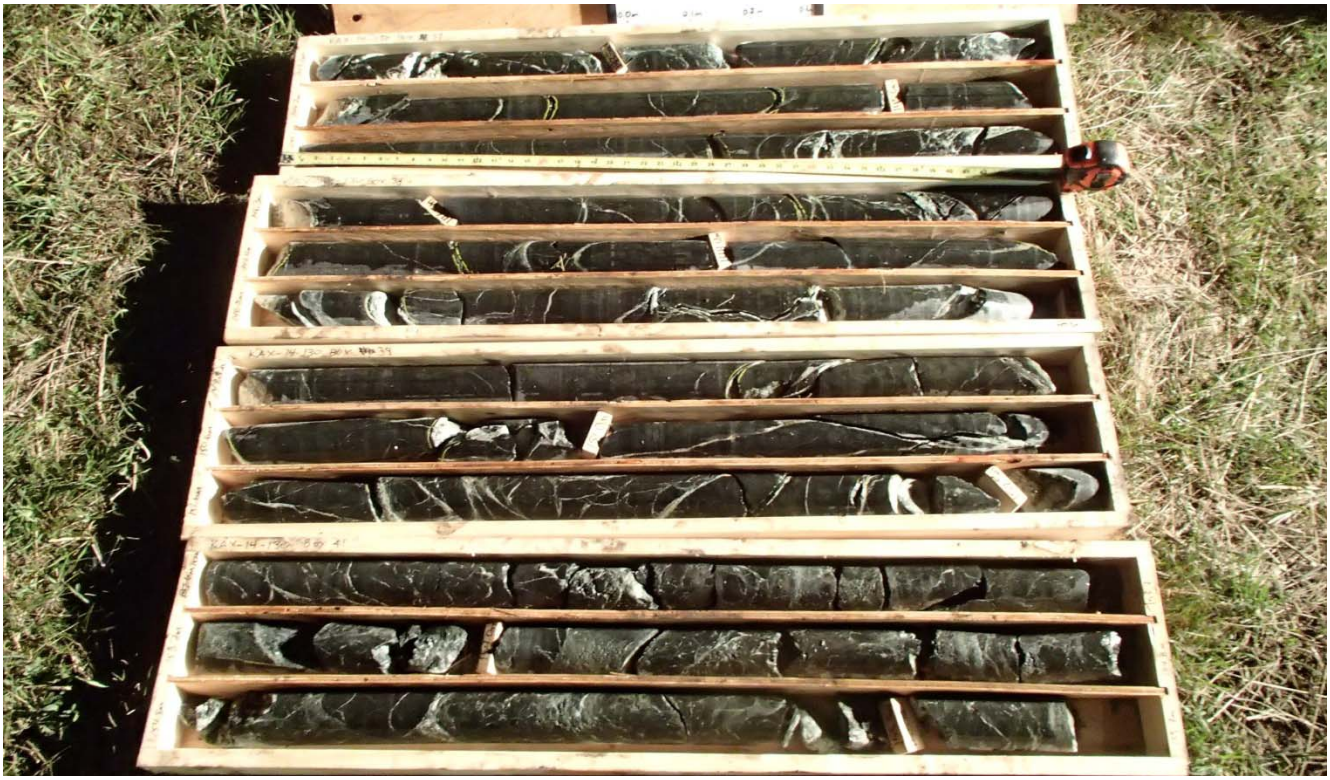


Photo II 155 KAX-14-130 Boxes 37 to 40 143.1 m to 155.7 m

Photo II 156 KAX-14-130 Boxes 41 to 44 155.7 m to 167.5 m

Photo II 157 KAX-14-130 Boxes 45 to 48 167.5 m to 180.2 m

Photo II 158 KAX-14-130 Boxes 49 to 51 180.2 m to 189.9 m

Photo II 159 KAX-14-130 Boxes 52 to 55 189.9 m to 203.8 m

Photo II 160 KAX-14-130 Boxes 56 to 59 203.8 m to 216.7 m

Photo II 161 KAX-14-130 Boxes 60 to 62 216.7 m to 226.0 m

General Photographs

GENERAL PHOTOGRAPHS

Photo II-162 Air Lift Test Setup

Photo II-163 Single Packer Test Setup

Photo II-164 Schedule 80 Slotted PVC Screen

Photo II-165 Pre-packed screen

Photo II-166 Van Ruth Plug

Photo II-167 Placing Filter Sand

Photo II-168 Mixing Grout

Photo II-169 Placing Surface Seal

Photo II 170 KAX-14-107 Completed Shallow and Deep Installations

Photo II-171 KAX-14-108 Completed Deep and Shallow Installations

Photo II 172 KAX-14-114 Completed Shallow and Deep Installations

Photo II 173 KAX-14-121 Completed Installation

Photo II 174 KAX-14-125 Completed Installation

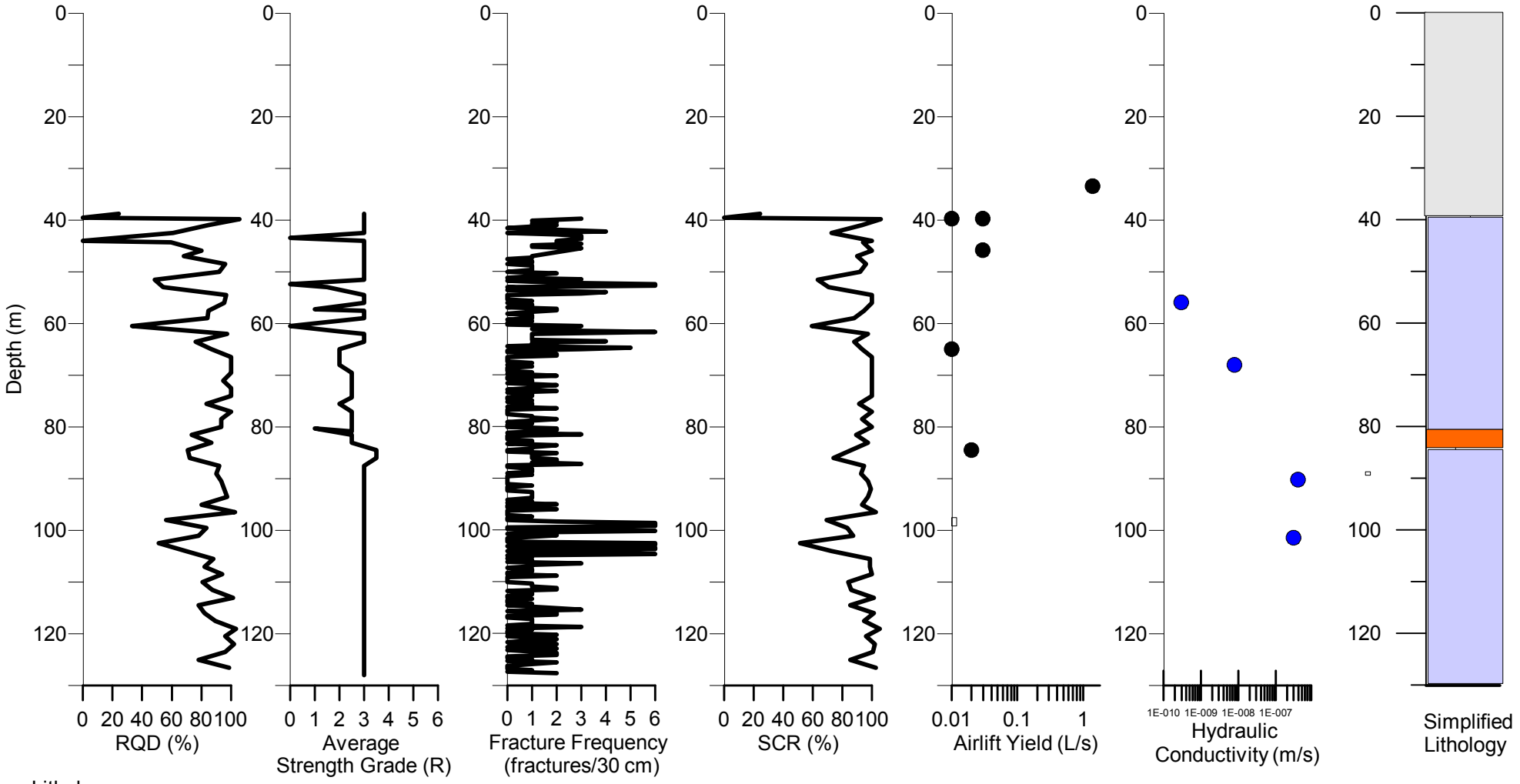
Photo II 175 KAX-14-128 Completed Shallow and Deep Installations

Photo II 176 KAX-14-130 Completed Installation

APPENDIX III

Downhole Rock Mass Characteristics

Downhole Rock Mass Characteristics for KAX-14-107



Lithology

- Ironmask Hybrid (IMH)
- Sugarloaf Diorite (SLD)
- Nicola Volcanics (NVV)
- Picrite (PCR)
- SLD/NVV Hybrid
- Dyke
- Overburden

Note

1. For 'Fracture Frequency' a value of '6' reflects '6' or '6+' fractures per 30 cm.

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT AND AUTHORIZATION FOR USE AND/OR PUBLICATION OF DATA,STATEMENTS,CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS IS RESERVED PENDING OUR WRITTEN APPROVAL.

CLIENT: Klohn Crippen Berger

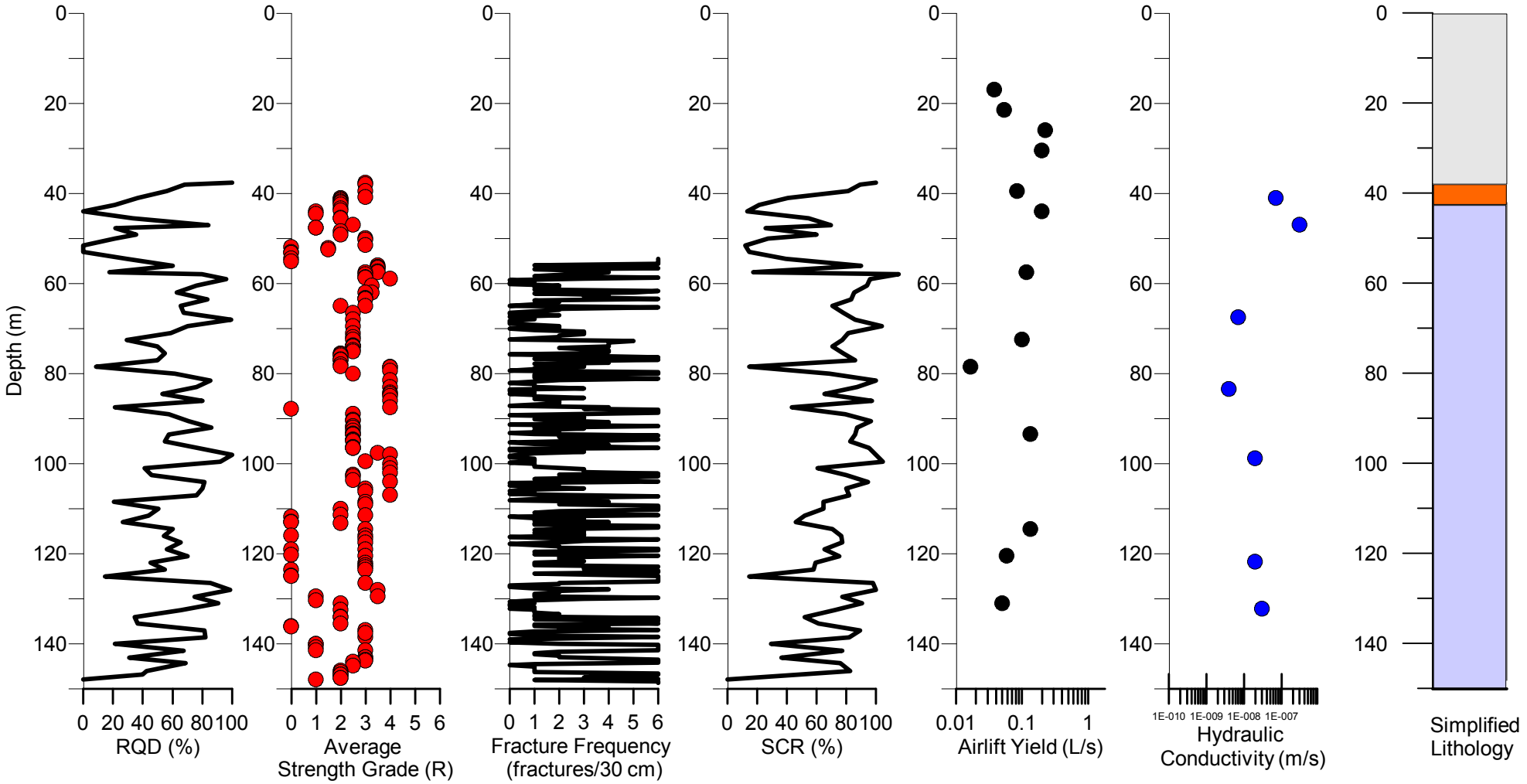
PROJECT: Jacko Lake Hydrogeology Assessment

TITLE: KGHM Ajax Copper Gold

PROJECT NO. M09871A01

FIGURE NO. III-1

Downhole Rock Mass Characteristics for KAX-14-108



Lithology

- Ironmask Hybrid (IMH)
- Sugarloaf Diorite (SLD)
- Nicola Volcanics (NVV)
- Picrite (PCR)
- SLD/NVV Hybrid
- Dyke
- Overburden

Note

1. For 'Fracture Frequency' a value of '6' reflects '6' or '6+' fractures per 30 cm.

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CLIENT: Klohn Crippen Berger

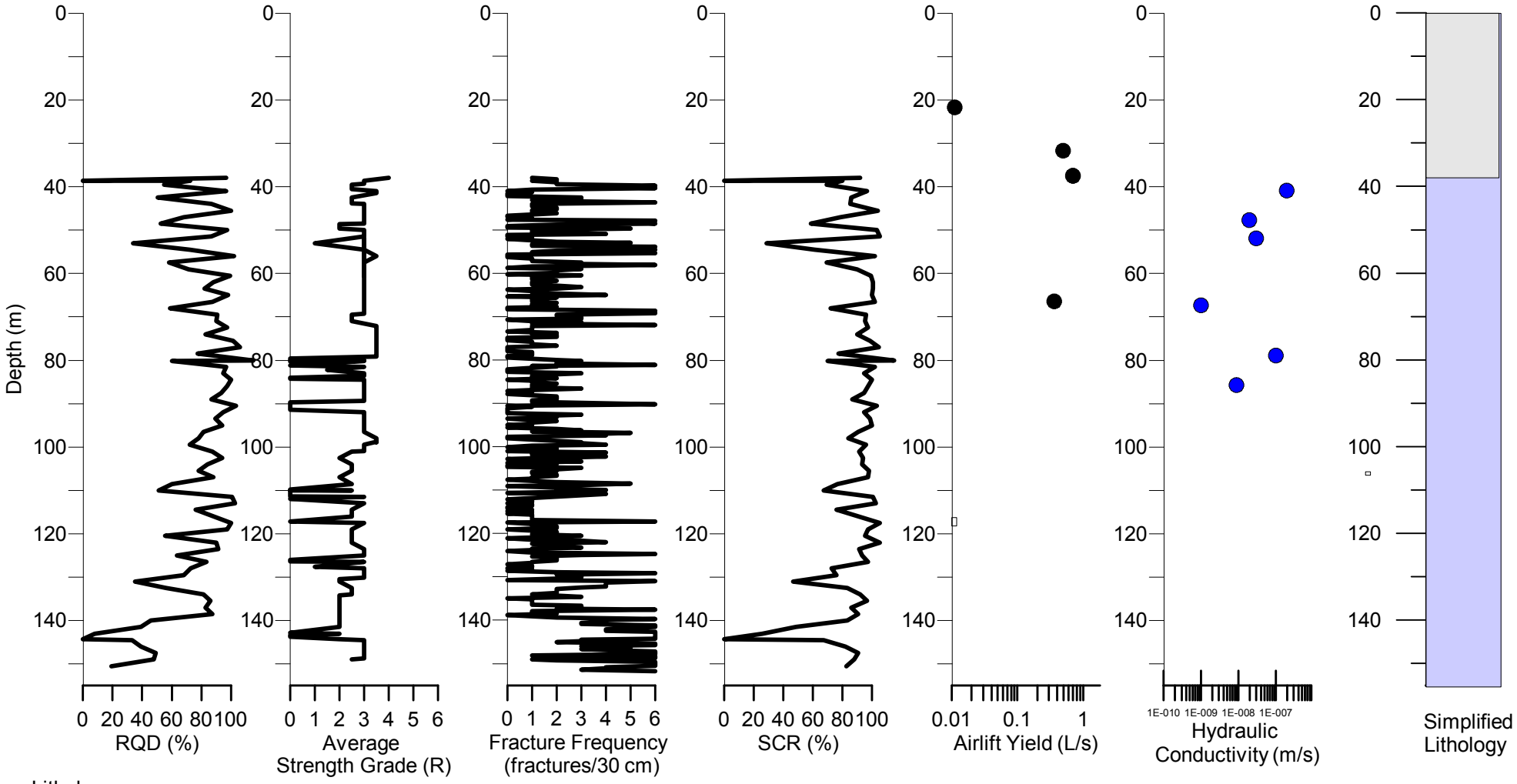
PROJECT: Jacko Lake Hydrogeology Assessment

TITLE: KGHM Ajax Copper Gold

PROJECT NO. M09871A01

FIGURE NO. III-2

Downhole Rock Mass Characteristics for KAX-14-114



Lithology

- Ironmask Hybrid (IMH)
- Sugarloaf Diorite (SLD)
- Nicola Volcanics (NVV)
- Picrite (PCR)
- SLD/NVV Hybrid
- Dyke
- Overburden

Note

1. For 'Fracture Frequency' a value of '6' reflects '6' or '6+' fractures per 30 cm.

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CLIENT: Klohn Crippen Berger

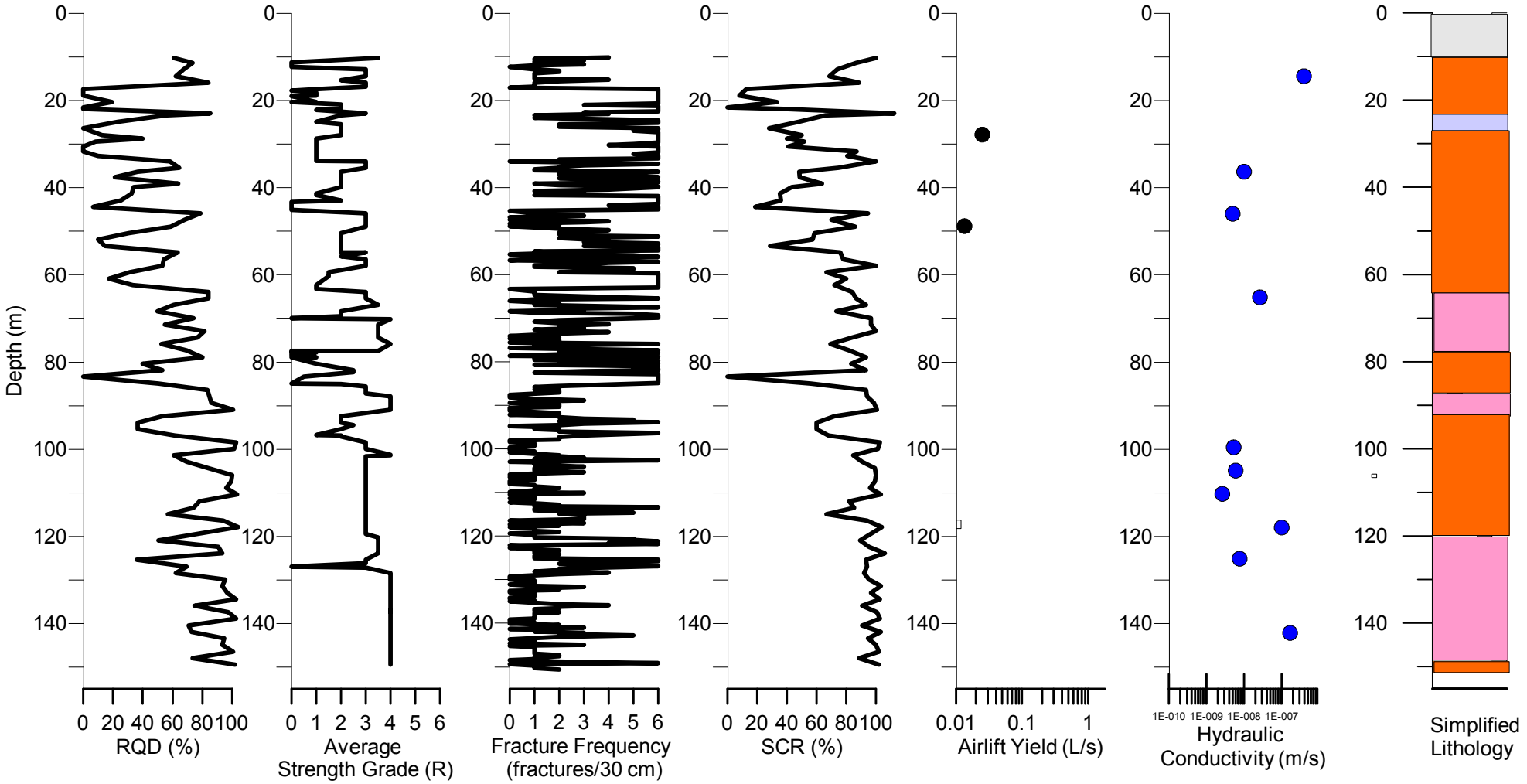
PROJECT: Jacko Lake Hydrogeology Assessment

TITLE: KGHM Ajax Copper Gold

PROJECT NO. M09871A01

FIGURE NO. III-3

Downhole Rock Mass Characteristics for KAX-14-121



Lithology

- Ironmask Hybrid (IMH)
- Sugarloaf Diorite (SLD)
- Nicola Volcanics (NVV)
- Picrite (PCR)
- SLD/NVV Hybrid
- Dyke
- Overburden

Note

1. For 'Fracture Frequency' a value of '6' reflects '6' or '6+' fractures per 30 cm.

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CLIENT: Klohn Crippen Berger

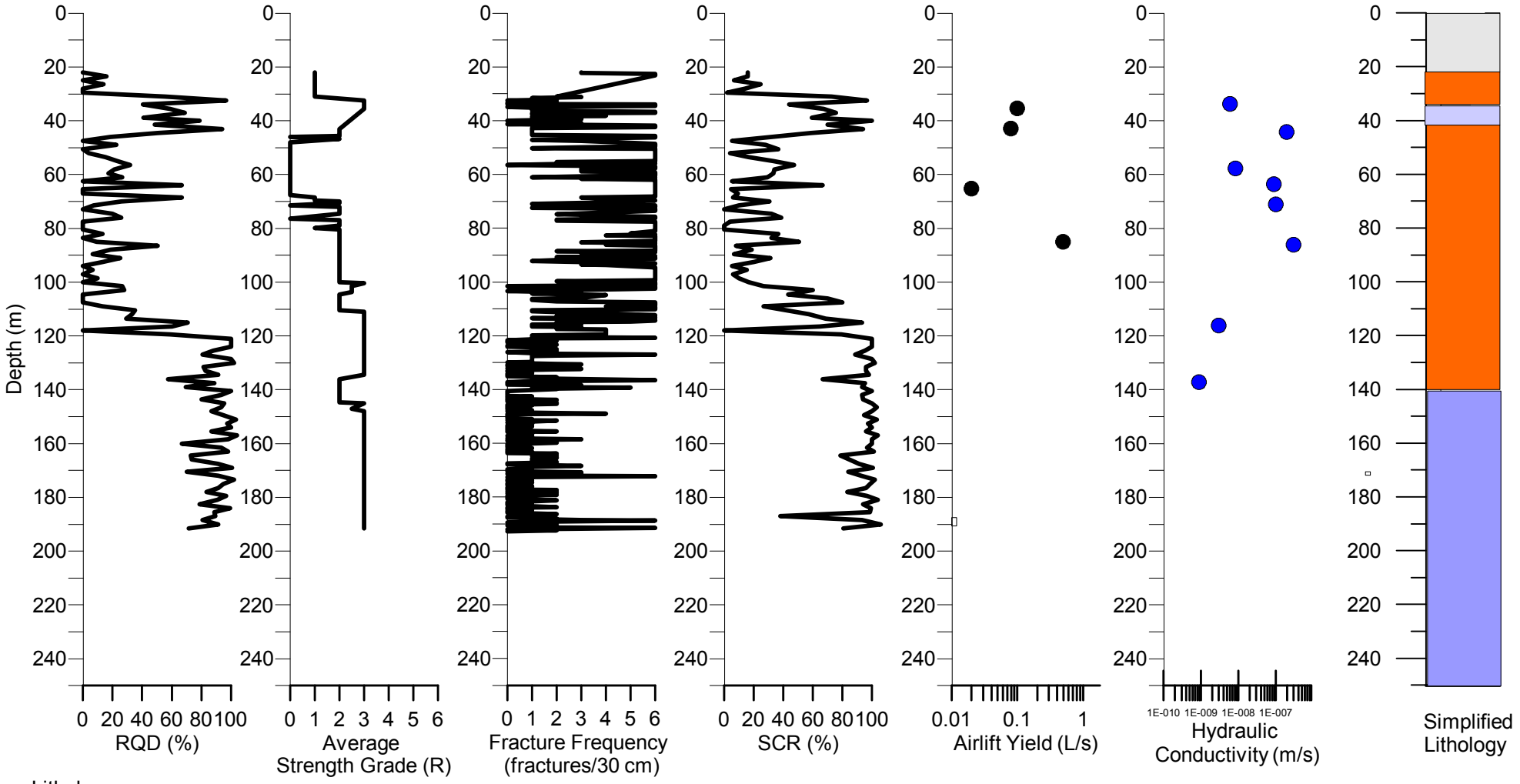
PROJECT: Jacko Lake Hydrogeology Assessment

TITLE: KGHM Ajax Copper Gold

PROJECT NO. M09871A01

FIGURE NO. III-4

Downhole Rock Mass Characteristics for KAX-14-124



Lithology

- Ironmask Hybrid (IMH)
- Sugarloaf Diorite (SLD)
- Nicola Volcanics (NVV)
- Picrite (PCR)
- SLD/NVV Hybrid
- Dyke
- Overburden

Note

1. For 'Fracture Frequency' a value of '6' reflects '6' or '6+' fractures per 30 cm.

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CLIENT: Klohn Crippen Berger

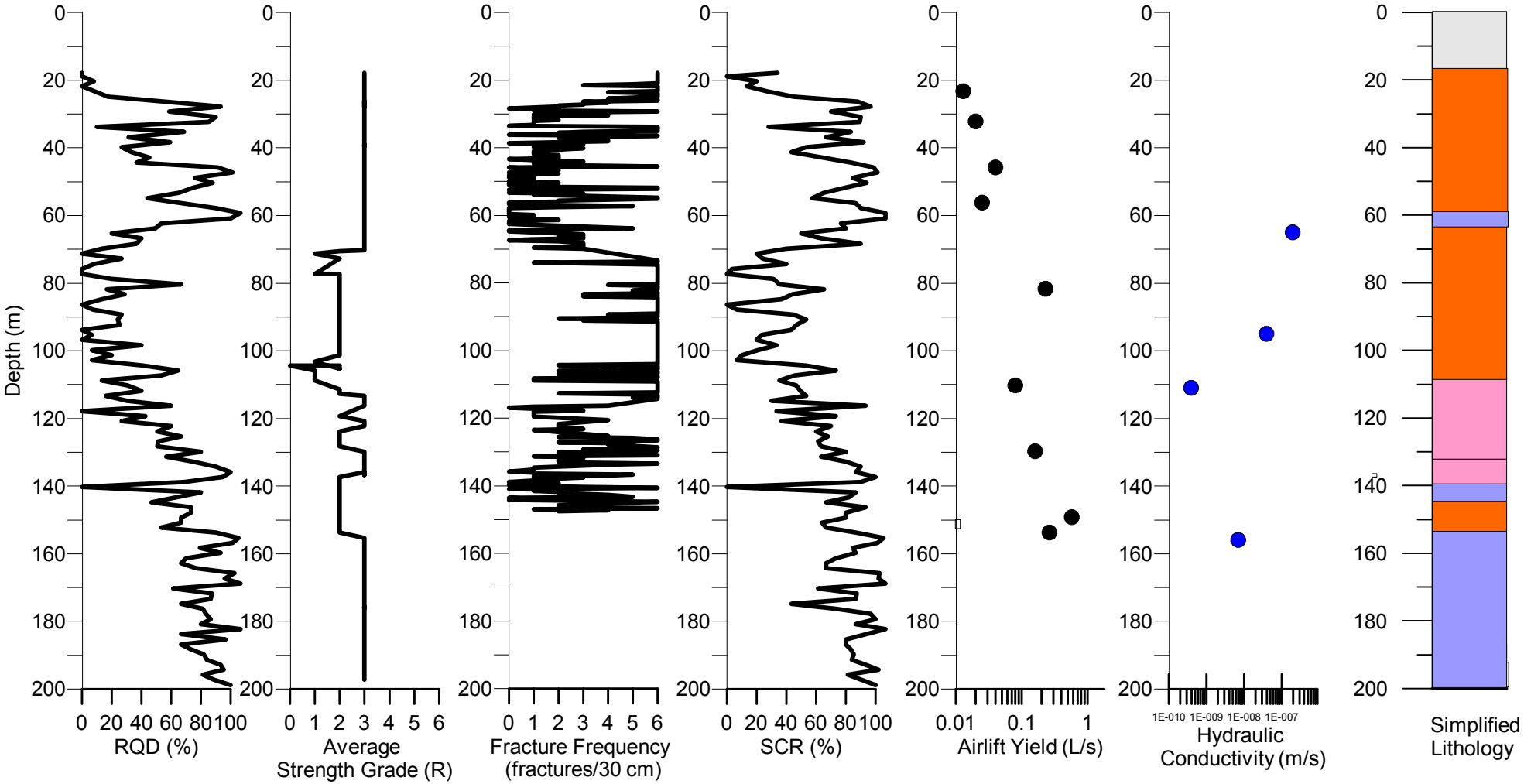
PROJECT: Jacko Lake Hydrogeology Assessment

TITLE: KGHM Ajax Copper Gold

PROJECT NO. M09871A01

FIGURE NO. III-5

Downhole Rock Mass Characteristics for KAX-14-128



Lithology

- Ironmask Hybrid (IMH)
- Sugarloaf Diorite (SLD)
- Nicola Volcanics (NVV)
- Picrite (PCR)
- SLD/NVV Hybrid
- Dyke
- Overburden

Note

1. For 'Fracture Frequency' a value of '6' reflects '6' or '6+' fractures per 30 cm.

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CLIENT: Klohn Crippen Berger

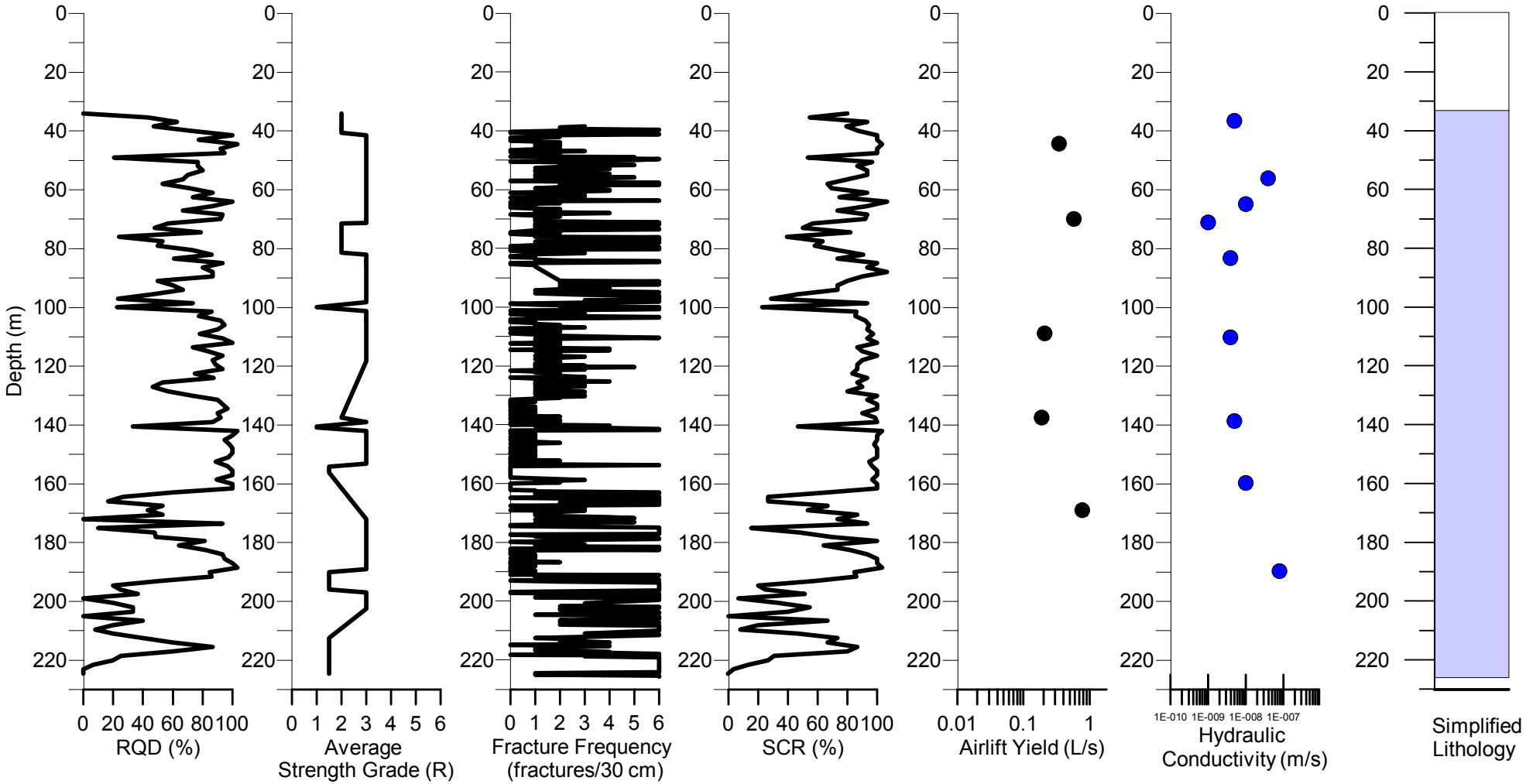
PROJECT: Jacko Lake Hydrogeology Assessment

TITLE: KGHM Ajax Copper Gold

PROJECT NO. M09871A01

FIGURE NO. III-6

Downhole Rock Mass Characteristics for KAX-14-130



Lithology

- Ironmask Hybrid (IMH)
- Sugarloaf Diorite (SLD)
- Nicola Volcanics (NVV)
- Picrite (PCR)
- SLD/NVV Hybrid
- Dyke
- Overburden

Note

1. For 'Fracture Frequency' a value of '6' reflects '6' or '6+' fractures per 30 cm.

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CLIENT: Klohn Crippen Berger

PROJECT: Jacko Lake Hydrogeology Assessment

TITLE: KGHM Ajax Copper Gold

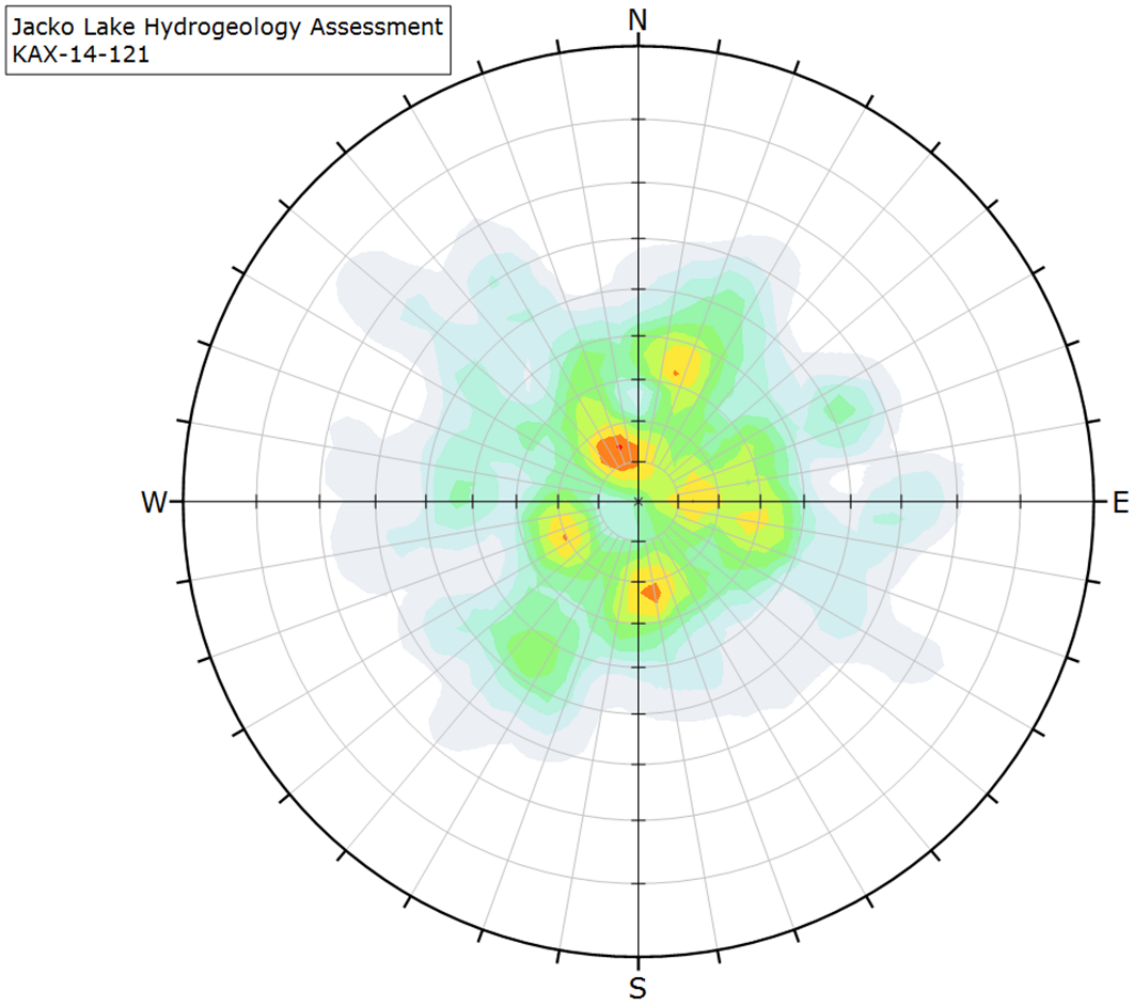
PROJECT NO. M09871A01

FIGURE NO. III-7

APPENDIX IV

Stereonets

Appendix IV
Stereonets

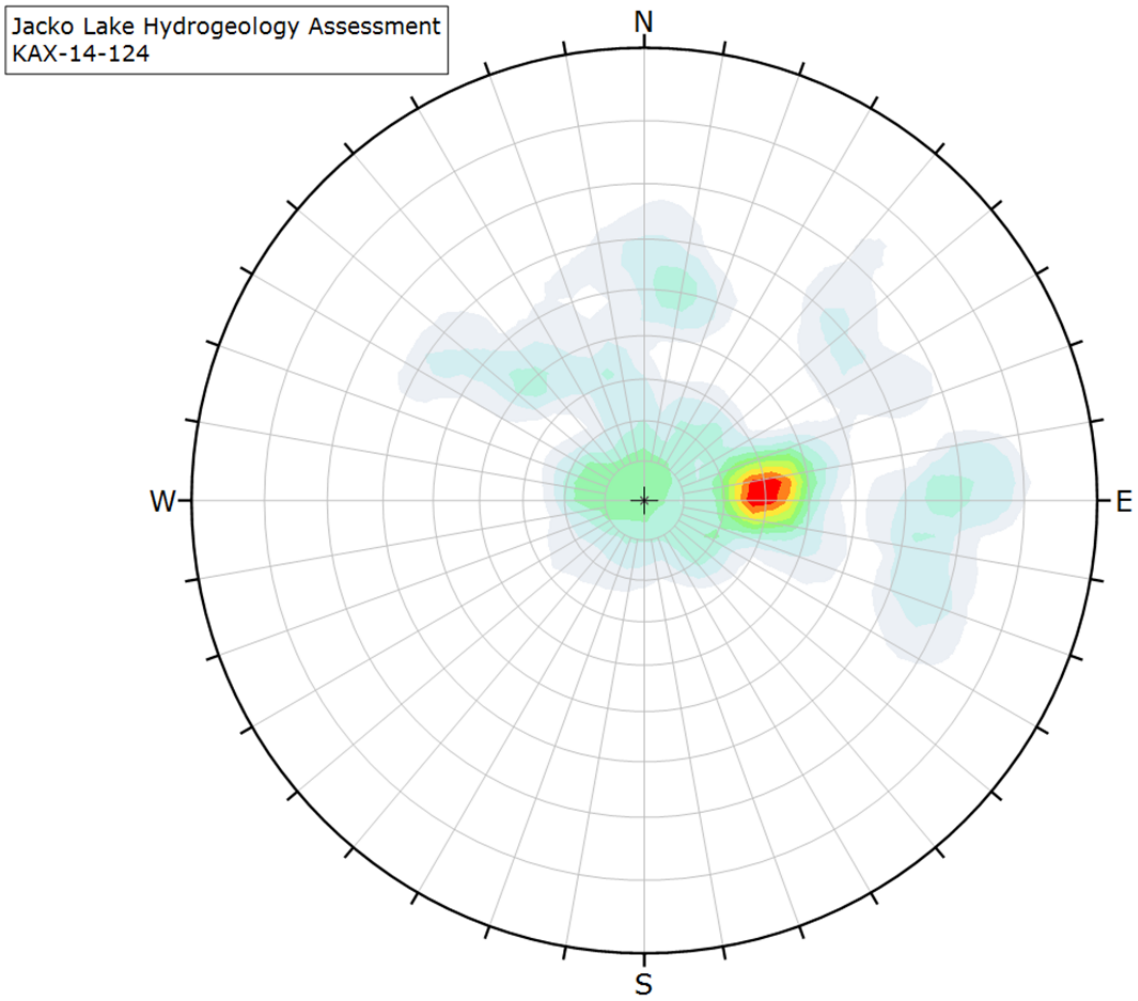


Color	Density Concentrations
	0.00% - 0.50%
	0.50% - 1.00%
	1.00% - 1.50%
	1.50% - 2.00%
	2.00% - 2.50%
	2.50% - 3.00%
	3.00% - 3.50%
	3.50% - 4.00%
	4.00% - 4.50%
	4.50% - 5.00%

Maximum Density	4.54%
Contour Data	Pole Vectors
Contour Distribution	Fisher
Counting Circle Size	1.0%

Plot Mode	Pole Vectors
Vector Count	376 (376 Entries)
Hemisphere	Lower
Projection	Equal Angle

Figure 1 KAX-14-121 Oriented Core Data

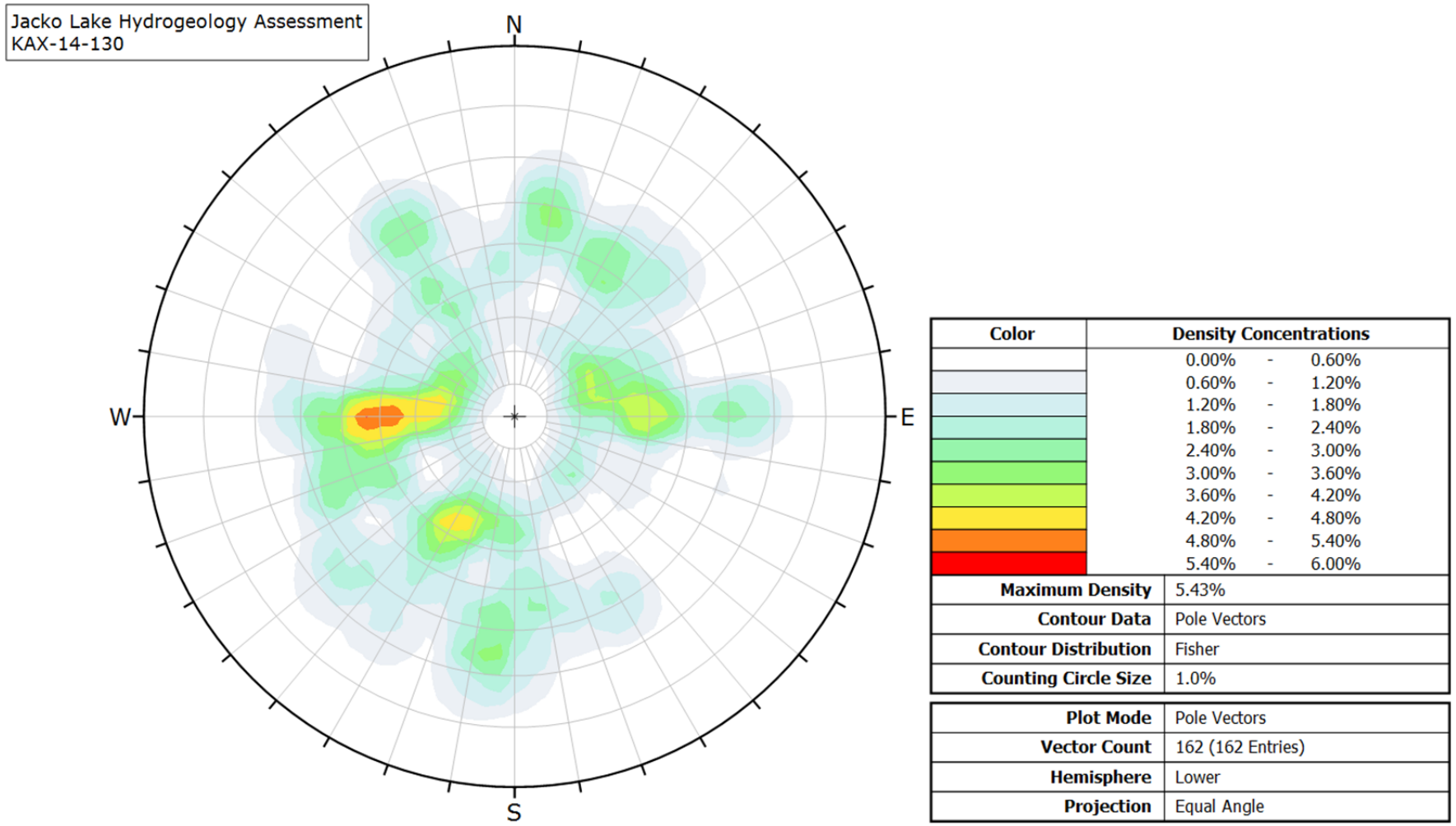


Color	Density Concentrations
	0.00% - 1.20%
	1.20% - 2.40%
	2.40% - 3.60%
	3.60% - 4.80%
	4.80% - 6.00%
	6.00% - 7.20%
	7.20% - 8.40%
	8.40% - 9.60%
	9.60% - 10.80%
	10.80% - 12.00%

Maximum Density	11.86%
Contour Data	Pole Vectors
Contour Distribution	Fisher
Counting Circle Size	1.0%

Plot Mode	Pole Vectors
Vector Count	84 (84 Entries)
Hemisphere	Lower
Projection	Equal Angle

Figure 2 KAX-14-124 Oriented Core Data



Color	Density Concentrations
	0.00% - 0.60%
	0.60% - 1.20%
	1.20% - 1.80%
	1.80% - 2.40%
	2.40% - 3.00%
	3.00% - 3.60%
	3.60% - 4.20%
	4.20% - 4.80%
	4.80% - 5.40%
	5.40% - 6.00%

Maximum Density	5.43%
Contour Data	Pole Vectors
Contour Distribution	Fisher
Counting Circle Size	1.0%

Plot Mode	Pole Vectors
Vector Count	162 (162 Entries)
Hemisphere	Lower
Projection	Equal Angle

Figure 3 KAX-14-130 Oriented Core Data

APPENDIX V

Packer Test Data

PACKER TEST CALCULATION SHEET

Klohn Crippen Berger

PROJECT	AJAX GW Study	**PROJECT NO.**	M09871A01	**DATE**	29-Apr-14

Drill Hole ID KAX-14-107

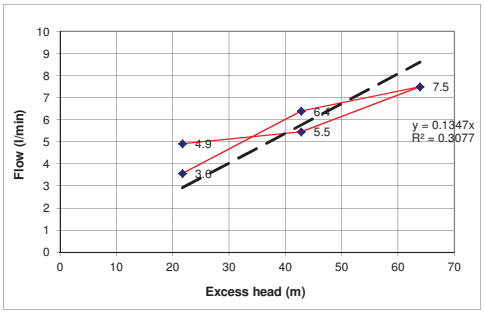
Hole Plunge	90 deg	True depth to ground water	m
Test Interval from	56 m to 62 m	Gauge height above ground	0.66 m
Test length	6 m	Ground surface elevation	m
Hole diameter	0.1226 m	Static Head	6.47 kPa
		= (true gauge height (m) + groundwater depth (m)) x 9.81	

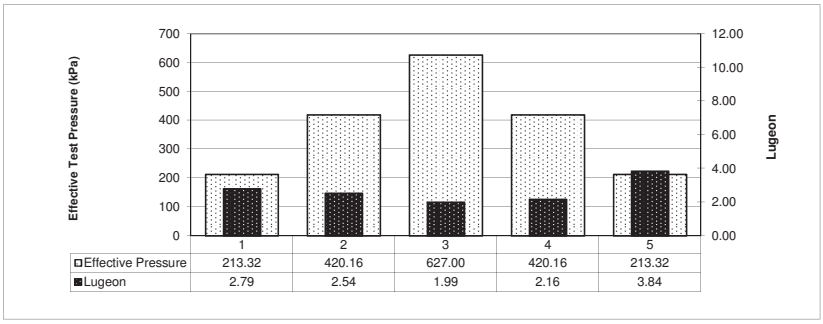
Gauge Pressure (psi)	Net Test Pressure (kPa)	Water Loss																Average flow (l/min)	Take (l/min/m)	Lugeon	Permeability (m/s)
30	213.32	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	3.57	0.60	2.79	3.33E-07
		Take (L/min)	3.70	3.60	3.55	3.55	3.55	3.60	3.53	3.62	3.50	3.55	3.55								
		Take (l/min)	3.70	3.60	3.55	3.55	3.55	3.60	3.53	3.62	3.50	3.55	3.55	0.00	0.00	0.00	0.00				
60	420.16	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	6.40	1.07	2.54	3.03E-07
		Take (L/min)	6.45	6.45	6.40	6.40	6.25	6.45	6.40	6.40	6.40	6.40	6.40								
		Take (l/min)	6.45	6.45	6.40	6.40	6.25	6.45	6.40	6.40	6.40	6.40	6.40	0.00	0.00	0.00	0.00				
90	627.00	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	7.50	1.25	1.99	2.38E-07
		Take (L/min)	7.60	7.60	7.55	7.50	7.40	7.45	7.55	7.45	7.45	7.45	7.45								
		Take (l/min)	7.60	7.60	7.55	7.50	7.40	7.45	7.55	7.45	7.45	7.45	7.45	0.00	0.00	0.00	0.00				
60	420.16	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	5.45	0.91	2.16	2.58E-07
		Take (L/min)	5.50	5.50	5.50	5.50	5.45	5.40	5.45	5.50	5.40	5.45	5.40	5.45	5.40						
		Take (l/min)	5.50	5.50	5.50	5.50	5.45	5.40	5.45	5.50	5.40	5.45	5.40	5.45	5.40	0.00	0.00				
30	213.32	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	4.92	0.82	3.84	4.58E-07
		Take (L/min)	5.05	5.00	5.00	4.95	4.90	4.95	4.85	4.85	4.85	4.85	4.85								
		Take (l/min)	5.05	5.00	5.00	4.95	4.90	4.95	4.85	4.85	4.85	4.85	4.85	0.00	0.00	0.00	0.00				

Test Pressure = Gauge pressure + static head - friction losses. **Note: friction losses ignored for this calculation.**

One Lugeon = 1 litre per minute per metre at a pressure of 10 bars.

K = Flow x ln(2 x Test Length/Hole diameter) / (2 x pi xTest length x Net head of water table at centre of test section) **Ref. Hoek and Bray.**





Approximate Permeability (m/s)

Min k =	2.4E-07
Max k =	3.3E-07
Avg K =	3.2E-07
Best fit K =	2.7E-07

Flow Type Interpretation

Laminar	Yes
Turbulant	No
Washout	No
Swelling	No
Hydrofracturing	No

Comments

Ground water depth taken prior to packer test.

PACKER TEST CALCULATION SHEET

Klohn Crippen Berger

PROJECT	AJAX GW Study	**PROJECT NO.**	M09871A01
DATE	16-Mar-14		

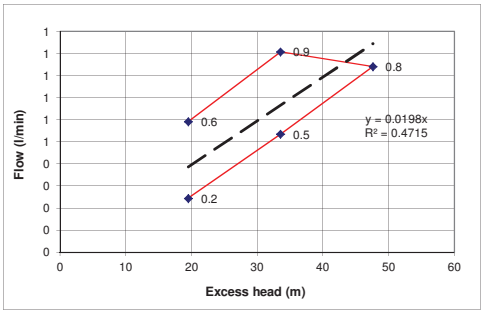
Drill Hole ID	KAX-14-108	True depth to ground water	4.35 m
Hole Plunge	90 deg	Gauge height above ground	1.1 m
Test Interval from	41 m to 44 m	Ground surface elevation	1087 m
Test length	3 m	Static Head	53.46 kPa
Hole diameter	0.1226 m	= (true gauge height (m) + groundwater depth (m)) x 9.81	

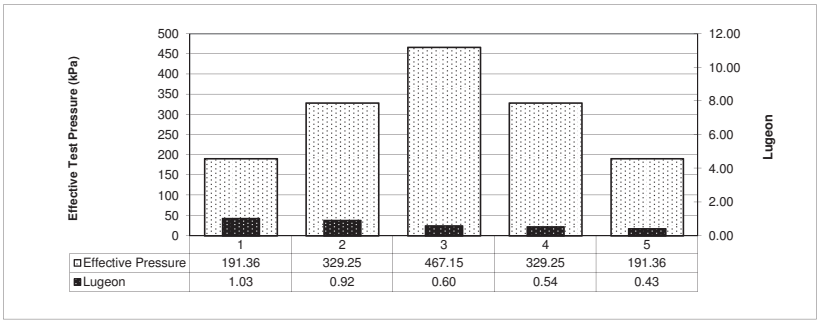
Gauge Pressure (psi)	Net Test Pressure (kPa)	Water Loss																Average flow (l/min)	Take (l/min/m)	Lugeon	Permeability (m/s)
20	191.36	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.59	0.20	1.03	1.04E-07
		Take (L/min)				0.550	0.800	0.650	0.550	0.600	0.600	0.600	0.550	0.550	0.550	0.550	0.550				
		Take (l/min)				0.550	0.800	0.650	0.550	0.600	0.600	0.600	0.550	0.550	0.550	0.550	0.550				
40	329.25	Time (mins)			2	3	4	5	6	7	8	9	10	11	12	13	14	0.91	0.30	0.92	9.30E-08
		Take (L/min)			1.330	1.140	1.340	1.500	1.040	0.920	0.870	0.750	0.550	0.550	0.600	0.600	0.600				
		Take (l/min)			1.330	1.140	1.340	1.500	1.040	0.920	0.870	0.750	0.550	0.550	0.600	0.600	0.600				
60	467.15	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.84	0.28	0.60	6.08E-08
		Take (L/min)	1.040	0.510	1.090	0.860	1.100	0.600	0.820	0.930	0.730	0.820	0.820	0.840	0.820	0.820	0.820				
		Take (l/min)	1.040	0.510	1.090	0.860	1.100	0.600	0.820	0.930	0.730	0.820	0.820	0.840	0.820	0.820	0.820				
40	329.25	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.54	0.18	0.54	5.49E-08
		Take (L/min)	0.500	0.550	0.550	0.500	0.600	0.530	0.560	0.530	0.550	0.540	0.540	0.520	0.520	0.520	0.520				
		Take (l/min)	0.500	0.550	0.550	0.500	0.600	0.530	0.560	0.530	0.550	0.540	0.540	0.520	0.520	0.520	0.520				
20	191.36	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.25	0.08	0.43	4.32E-08
		Take (L/min)		0.310	0.220	0.240	0.260	0.230	0.240	0.250	0.220	0.260	0.240	0.240	0.240	0.240	0.240				
		Take (l/min)		0.310	0.220	0.240	0.260	0.230	0.240	0.250	0.220	0.260	0.240	0.240	0.240	0.240	0.240				

Test Pressure = Gauge pressure + static head - friction losses. **Note: friction losses ignored for this calculation.**

One Lugeon = 1 litre per minute per metre at a pressure of 10 bars.

K = Flow x ln(2 x Test Length/Hole diameter) / (2 x pi xTest length x Net head of water table at centre of test section) **Ref. Hoek and Bray.**





Approximate Permeability (m/s)

Min k =	4.3E-08
Max k =	1.0E-07
Avg K =	7.1E-08
Best fit K =	7.1E-08

Flow Type Interpretation

Laminar	Yes
Turbulant	No
Washout	No
Swelling	No
Hydrofracturing	No

Comments

Ground water depth taken prior to packer test.

PACKER TEST CALCULATION SHEET

Klohn Crippen Berger

PROJECT	AJAX GW Study	**PROJECT NO.**	M09871A01	**DATE**	17-Mar-14

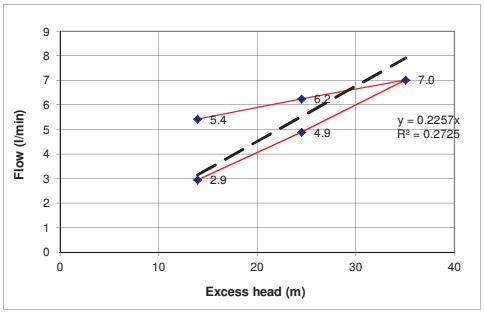
Drill Hole ID	KAX-14-108	True depth to ground water	2.33 m
Hole Plunge	90 deg	Gauge height above ground	1.09 m
Test Interval from	47 m to 57.96 m	Ground surface elevation	1087 m
Test length	10.96 m	Static Head	33.55 kPa
Hole diameter	0.1226 m	= (true gauge height (m) + groundwater depth (m)) x 9.81	

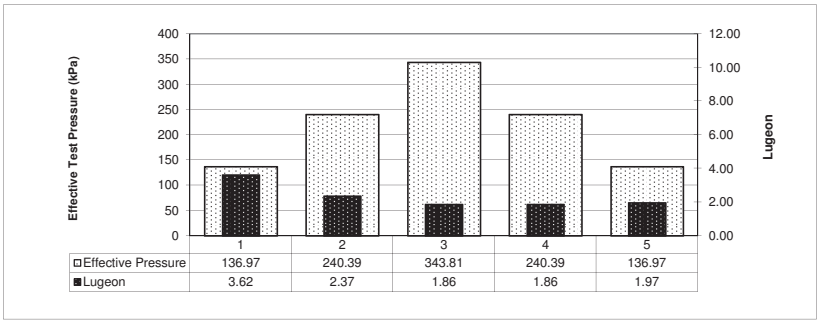
Gauge Pressure (psi)	Net Test Pressure (kPa)	Water Loss																Average flow (l/min)	Take (l/min/m)	Lugeon	Permeability (m/s)
15	136.97	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	5.43	0.50	3.62	4.88E-07
		Take (L/min)	5.800	5.700	5.700	5.500	6.150	5.000	5.350	5.450	5.300	5.300	5.350	5.300	5.200	5.200	5.200				
		Take (l/min)	5.800	5.700	5.700	5.500	6.150	5.000	5.350	5.450	5.300	5.300	5.350	5.300	5.200	5.200	5.200				
30	240.39	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	6.25	0.57	2.37	3.20E-07
		Take (L/min)	6.450	6.200	6.400	6.450	6.350	6.350	6.200	6.150	6.150	6.250	6.150	6.150	6.150	6.150	6.150				
		Take (l/min)	6.450	6.200	6.400	6.450	6.350	6.350	6.200	6.150	6.150	6.250	6.150	6.150	6.150	6.150	6.150				
45	343.81	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	7.02	0.64	1.86	2.51E-07
		Take (L/min)	7.200	7.100	7.100	7.100	7.100	7.100	7.000	7.000	7.000	6.900	7.000	7.000	6.900	6.900	6.900				
		Take (l/min)	7.200	7.100	7.100	7.100	7.100	7.100	7.000	7.000	7.000	6.900	7.000	7.000	6.900	6.900	6.900				
30	240.39	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	4.90	0.45	1.86	2.51E-07
		Take (L/min)	4.900	4.900	4.900	4.900	4.900	4.900	4.900	4.900	4.900	4.900									
		Take (l/min)	4.900	4.900	4.900	4.900	4.900	4.900	4.900	4.900	4.900	4.900	0.000	0.000	0.000	0.000	0.000				
15	136.97	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	2.95	0.27	1.97	2.65E-07
		Take (L/min)	3.050	2.850	3.000	3.000	3.000	3.000	3.000	3.000	2.900	2.850	2.800	2.950	2.950	2.950	2.950				
		Take (l/min)	3.050	2.850	3.000	3.000	3.000	3.000	3.000	3.000	2.900	2.850	2.800	2.950	2.950	2.950	2.950				

Test Pressure = Gauge pressure + static head - friction losses. Note: friction losses ignored for this calculation.

One Lugeon = 1 litre per minute per metre at a pressure of 10 bars.

K = Flow x ln(2 x Test Length/Hole diameter) / (2 x pi xTest length x Net head of water table at centre of test section) Ref. Hoek and Bray.





Approximate Permeability (m/s)

Min k =	2.5E-07
Max k =	4.9E-07
Avg K =	3.2E-07
Best fit K =	2.8E-07

Flow Type Interpretation

Laminar	Yes
Turbulant	No
Washout	No
Swelling	No
Hydrofracturing	No

Comments

Ground water depth taken prior to packer test.

PACKER TEST CALCULATION SHEET

Klohn Crippen Berger

PROJECT	AJAX GW Study	**PROJECT NO.**	M09871A01	**DATE**	18-Mar-14

Drill Hole ID KAX-14-108

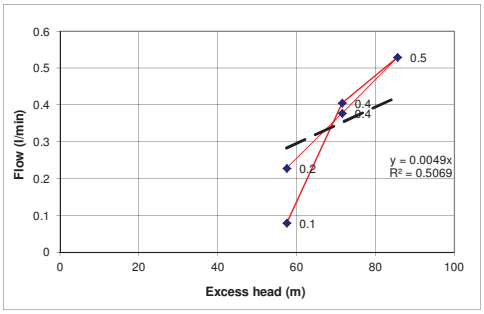
Hole Plunge	90	deg	True depth to ground water	42.27	m
Test Interval from	67.53	m to 78.5 m	Gauge height above ground	1.17	m
Test length	10.97	m	Ground surface elevation	1087	m
Hole diameter	0.1226	m	Static Head	426.15	kPa
			= (true gauge height (m) + groundwater depth (m)) x 9.81		

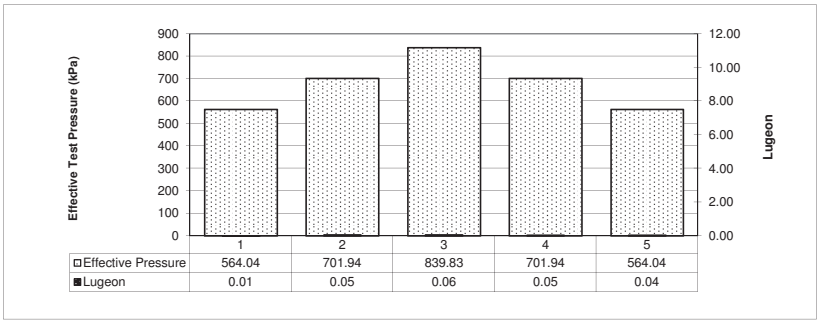
Gauge Pressure (psi)	Net Test Pressure (kPa)	Water Loss																Average flow (l/min)	Take (l/min/m)	Lugeon	Permeability (m/s)
20	564.04	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.08	0.01	0.01	1.75E-09
		Take (L/min)	0.090	0.090	0.090	0.080	0.070	0.080	0.080	0.070	0.070	0.080	0.080								
		Take (l/min)	0.090	0.090	0.090	0.080	0.070	0.080	0.080	0.070	0.070	0.080	0.080	0.000	0.000	0.000	0.000				
40	701.94	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.41	0.04	0.05	7.11E-09
		Take (L/min)	0.440	0.400	0.440	0.410	0.390	0.420	0.380	0.400	0.420	0.380	0.400	0.390							
		Take (l/min)	0.440	0.400	0.440	0.410	0.390	0.420	0.380	0.400	0.420	0.380	0.400	0.390	0.000	0.000	0.000				
60	839.83	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.53	0.05	0.06	7.77E-09
		Take (L/min)	0.530	0.530	0.540	0.530	0.525	0.525	0.520	0.550	0.510	0.540	0.530								
		Take (l/min)	0.530	0.530	0.540	0.530	0.525	0.525	0.520	0.550	0.510	0.540	0.530	0.000	0.000	0.000	0.000				
40	701.94	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.38	0.03	0.05	6.62E-09
		Take (L/min)	0.370	0.380	0.380	0.380	0.380	0.370	0.380	0.380	0.380	0.380	0.370	0.380							
		Take (l/min)	0.370	0.380	0.380	0.380	0.380	0.370	0.380	0.380	0.380	0.380	0.370	0.380	0.000	0.000	0.000				
20	564.04	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.23	0.02	0.04	4.99E-09
		Take (L/min)	0.230	0.230	0.230	0.230	0.230	0.230	0.220	0.230	0.230	0.230	0.230	0.230	0.220	0.230	0.230				
		Take (l/min)	0.230	0.230	0.230	0.230	0.230	0.230	0.220	0.230	0.230	0.230	0.230	0.230	0.220	0.230	0.230				

Test Pressure = Gauge pressure + static head - friction losses. **Note: friction losses ignored for this calculation.**

One Lugeon = 1 litre per minute per metre at a pressure of 10 bars.

K = Flow x ln(2 x Test Length/Hole diameter) / (2 x pi xTest length x Net head of water table at centre of test section) **Ref. Hoek and Bray.**





Approximate Permeability (m/s)

Min k =	1.7E-09
Max k =	7.8E-09
Avg K =	5.6E-09
Best fit K =	6.1E-09

Flow Type Interpretation

Laminar	Yes
Turbulant	No
Washout	No
Swelling	No
Hydrofracturing	No

Comments

Water level recorded 50 minutes after air lift test
No leakage observed throughout test

PACKER TEST CALCULATION SHEET

Klohn Crippen Berger

PROJECT	AJAX GW Study	**PROJECT NO.**	M09871A01	**DATE**	19-Mar-14

Drill Hole ID KAX-14-108

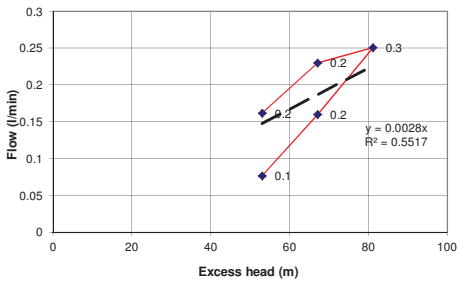
Hole Plunge	90	deg		True depth to ground water	38.5	m
Test Interval from	83.5	m to	93.5 m	Gauge height above ground	0.51	m
				Ground surface elevation	1087	m
Test length	10	m		Static Head	382.69	kPa
Hole diameter	0.1226	m		= (true gauge height (m) + groundwater depth (m)) x 9.81		

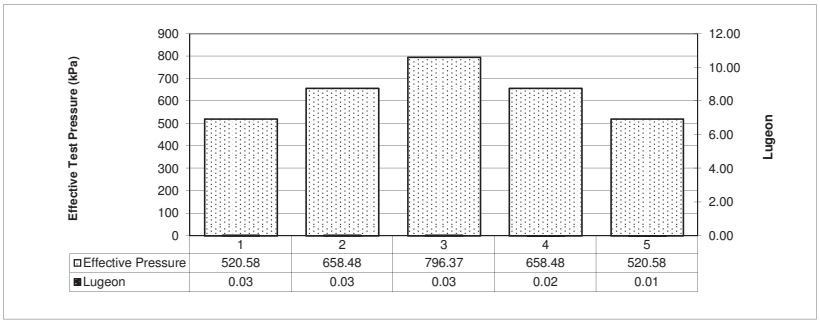
Gauge Pressure (psi)	Net Test Pressure (kPa)	Water Loss															Average flow (l/min)	Take (l/min/m)	Lugeon	Permeability (m/s)
		Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14				
		Take (L/min)	0.160	0.160	0.180	0.160	0.160	0.160	0.160	0.160	0.160	0.160	0.160								
20	520.58																	0.16	0.02	0.03	4.12E-09
		Take (l/min)	0.160	0.160	0.180	0.160	0.160	0.160	0.160	0.160	0.160	0.160	0.160	0.000	0.000	0.000	0.000				
		Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14				
		Take (L/min)	0.260	0.260	0.220	0.240	0.240	0.220	0.220	0.220	0.220	0.220	0.220	0.220							
40	658.48																	0.23	0.02	0.03	4.63E-09
		Take (l/min)	0.260	0.260	0.220	0.240	0.240	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.000	0.000	0.000				
		Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14				
		Take (L/min)	0.300	0.240	0.240	0.260	0.260	0.260	0.240	0.240	0.240	0.240	0.240								
60	796.37																	0.25	0.03	0.03	4.18E-09
		Take (l/min)	0.300	0.240	0.240	0.260	0.260	0.260	0.240	0.240	0.240	0.240	0.240	0.000	0.000	0.000	0.000				
		Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14				
		Take (L/min)	0.180	0.140	0.160	0.160	0.160	0.160	0.160	0.160	0.160	0.160	0.160	0.160							
40	658.48																	0.16	0.02	0.02	3.22E-09
		Take (l/min)	0.180	0.140	0.160	0.160	0.160	0.160	0.160	0.160	0.160	0.160	0.160	0.160	0.000	0.000	0.000				
		Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14				
		Take (L/min)	0.080	0.080	0.080	0.080	0.080	0.060	0.080	0.060	0.080	0.080	0.080	0.080							
20	520.58																	0.08	0.01	0.01	1.95E-09
		Take (l/min)	0.080	0.080	0.080	0.080	0.080	0.060	0.080	0.060	0.080	0.080	0.080	0.080	0.000	0.000	0.000				

Test Pressure = Gauge pressure + static head - friction losses. **Note: friction losses ignored for this calculation.**

One Lugeon = 1 litre per minute per metre at a pressure of 10 bars.

K = Flow x ln(2 x Test Length/Hole diameter) / (2 x pi xTest length x Net head of water table at centre of test section) **Ref. Hoek and Bray.**





Approximate Permeability (m/s)

Min k =	2.0E-09
Max k =	4.6E-09
Avg K =	3.6E-09
Best fit K =	3.8E-09

Flow Type Interpretation

Laminar	Yes
Turbulant	No
Washout	No
Swelling	No
Hydrofracturing	No

Comments

No leakage out of casing
Leakage out of adapter up to 0.2 L/min

PACKER TEST CALCULATION SHEET

Klohn Crippen Berger

PROJECT	AJAX GW Study	**PROJECT NO.**	M09871A01	**DATE**	20-Mar-14

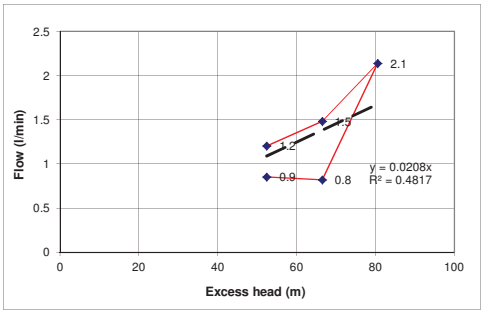
Drill Hole ID	KAX-14-108	True depth to ground water	37.88 m
Hole Plunge	90 deg	Gauge height above ground	0.51 m
Test Interval from	98.8 m to 114.5 m	Ground surface elevation	1087 m
Test length	15.7 m	Static Head	376.61 kPa
Hole diameter	0.1226 m	= (true gauge height (m) + groundwater depth (m)) x 9.81	

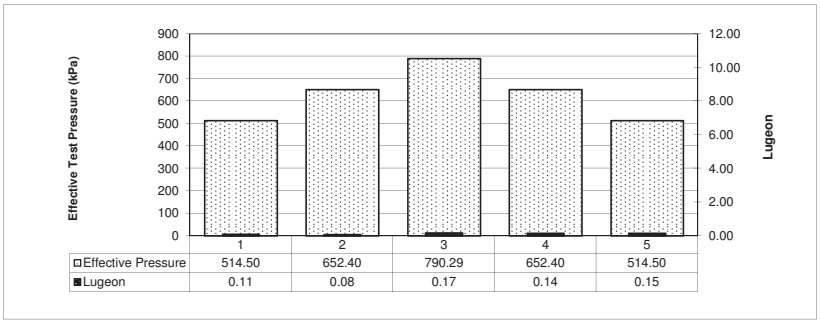
Gauge Pressure (psi)	Net Test Pressure (kPa)	Water Loss															Average flow (l/min)	Take (l/min/m)	Lugeon	Permeability (m/s)
20	514.50	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.85	0.05	0.11	1.52E-08
		Take (L/min)	0.880	0.840	0.860	0.840	0.860	0.840	0.860	0.840	0.840	0.860	0.860							
		Take (l/min)	0.880	0.840	0.860	0.840	0.860	0.840	0.860	0.840	0.840	0.860	0.860	0.000	0.000	0.000	0.000			
40	652.40	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.82	0.05	0.08	1.16E-08
		Take (L/min)	0.820	0.840	0.820	0.820	0.820	0.820	0.820	0.820	0.820	0.820								
		Take (l/min)	0.820	0.840	0.820	0.820	0.820	0.820	0.820	0.820	0.820	0.820	0.000	0.000	0.000	0.000	0.000			
60	790.29	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	2.14	0.14	0.17	2.49E-08
		Take (L/min)	2.220	2.220	2.100	2.180	2.200	2.200	2.200	2.000	2.060	2.060	2.160	2.080	2.060	2.160	2.180			
		Take (l/min)	2.220	2.220	2.100	2.180	2.200	2.200	2.200	2.000	2.060	2.060	2.160	2.080	2.060	2.160	2.180			
40	652.40	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	1.48	0.09	0.14	2.09E-08
		Take (L/min)	1.460	1.480	1.500	1.480	1.500	1.480	1.500	1.480	1.480	1.480	1.480							
		Take (l/min)	1.460	1.480	1.500	1.480	1.500	1.480	1.500	1.480	1.480	1.480	1.480	0.000	0.000	0.000	0.000			
20	514.50	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	1.20	0.08	0.15	2.15E-08
		Take (L/min)	1.200	1.300	1.200	1.200	1.200	1.200	1.180	1.200	1.180	1.200	1.180							
		Take (l/min)	1.200	1.300	1.200	1.200	1.200	1.200	1.180	1.200	1.180	1.200	1.180	0.000	0.000	0.000	0.000			

Test Pressure = Gauge pressure + static head - friction losses. **Note: friction losses ignored for this calculation.**

One Lugeon = 1 litre per minute per metre at a pressure of 10 bars.

K = Flow x ln(2 x Test Length/Hole diameter) / (2 x pi xTest length x Net head of water table at centre of test section) **Ref. Hoek and Bray.**





Approximate Permeability (m/s)

Min k =	1.2E-08
Max k =	2.5E-08
Avg K =	1.9E-08
Best fit K =	1.9E-08

Flow Type Interpretation

Laminar	Yes
Turbulant	No
Washout	No
Swelling	No
Hydrofracturing	No

Comments

No leakage out of casing
Leakage out of adapter up to 0.2 L/min

PACKER TEST CALCULATION SHEET

Klohn Crippen Berger

PROJECT	AJAX GW Study	**PROJECT NO.**	M09871A01	**DATE**	22-Mar-14

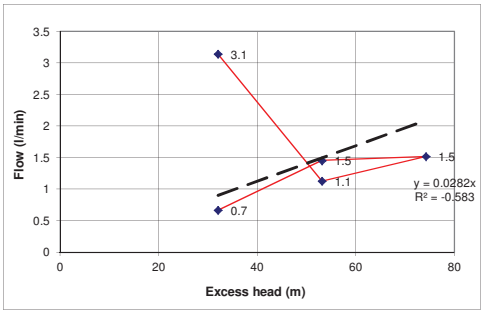
Drill Hole ID	KAX-14-108	True depth to ground water	9.8 m
Hole Plunge	90 deg	Gauge height above ground	1.18 m
Test Interval from	132.25 m to 148.4 m	Ground surface elevation	1087 m
Test length	16.15 m	Static Head	107.71 kPa
Hole diameter	0.1226 m	= (true gauge height (m) + groundwater depth (m)) x 9.81	

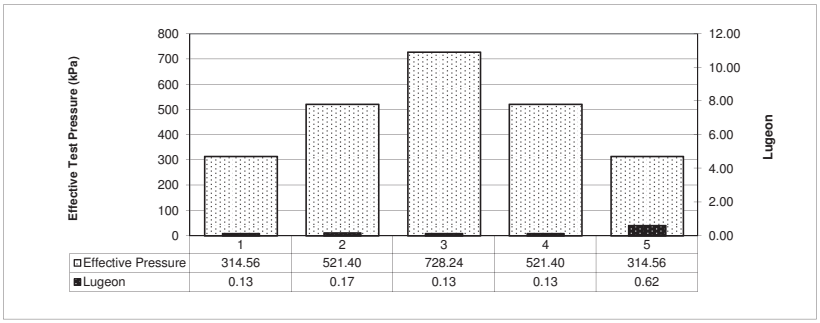
Gauge Pressure (psi)	Net Test Pressure (kPa)	Water Loss																Average flow (l/min)	Take (l/min/m)	Lugeon	Permeability (m/s)
30	314.56	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.67	0.04	0.13	1.91E-08
		Take (L/min)	0.650	0.660	0.670	0.670	0.660	0.670	0.700	0.680	0.680	0.660	0.670	0.660	0.660	0.670	0.650				
		Take (l/min)	0.650	0.660	0.670	0.670	0.660	0.670	0.700	0.680	0.680	0.660	0.670	0.660	0.660	0.670	0.650				
60	521.40	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	1.46	0.09	0.17	2.51E-08
		Take (L/min)	1.520	1.520	1.490	1.460	1.430	1.470	1.430	1.420	1.460	1.430	1.420	1.450	1.420						
		Take (l/min)	1.520	1.520	1.490	1.460	1.430	1.470	1.430	1.420	1.460	1.430	1.420	1.450	1.420	0.000	0.000				
90	728.24	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	1.52	0.09	0.13	1.87E-08
		Take (L/min)	1.530	1.490	1.520	1.480	1.510	1.490	1.510	1.530	1.560	1.510	1.540	1.530	1.530	1.550	1.510				
		Take (l/min)	1.530	1.490	1.520	1.480	1.510	1.490	1.510	1.530	1.560	1.510	1.540	1.530	1.530	1.550	1.510				
60	521.40	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	1.13	0.07	0.13	1.94E-08
		Take (L/min)	1.140	1.140	1.140	1.130	1.110	1.150	1.120	1.110	1.130	1.150	1.090	1.120	1.120						
		Take (l/min)	1.140	1.140	1.140	1.130	1.110	1.150	1.120	1.110	1.130	1.150	1.090	1.120	1.120	0.000	0.000				
30	314.56	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	3.14	0.19	0.62	8.96E-08
		Take (L/min)	3.300	3.200	3.200	3.100	3.000	3.250	3.350	3.300	3.200	3.150	3.100	3.050	3.000	2.970	2.910				
		Take (l/min)	3.300	3.200	3.200	3.100	3.000	3.250	3.350	3.300	3.200	3.150	3.100	3.050	3.000	2.970	2.910				

Test Pressure = Gauge pressure + static head - friction losses. Note: friction losses ignored for this calculation.

One Lugeon = 1 litre per minute per metre at a pressure of 10 bars.

K = Flow x ln(2 x Test Length/Hole diameter) / (2 x pi xTest length x Net head of water table at centre of test section) Ref. Hoek and Bray.





Approximate Permeability (m/s)

Min k =	1.9E-08
Max k =	9.0E-08
Avg K =	2.1E-08
Best fit K =	2.6E-08

Flow Type Interpretation

Laminar	Yes
Turbulant	No
Washout	No
Swelling	No
Hydrofracturing	No

Comments

Leakage out of casing during final step at ~1 L/min
Leakage out of adapter up to 0.5 L/min
Average K value excludes 30 psi depressurization stage

PACKER TEST CALCULATION SHEET

Klohn Crippen Berger

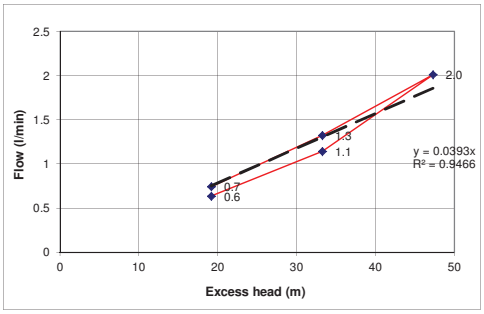
PROJECT	AJAX GW Study	**PROJECT NO.**	M09871A01
DATE	30-Mar-14		
Drill Hole ID	KAX-14-114	True depth to ground water	3.97 m
Hole Plunge	90 deg	Gauge height above ground	1.18 m
Test Interval from	47.75 m to 50 m	Ground surface elevation	m
Test length	2.25 m	Static Head	50.52 kPa
Hole diameter	0.096 m	= (true gauge height (m) + groundwater depth (m)) x 9.81	

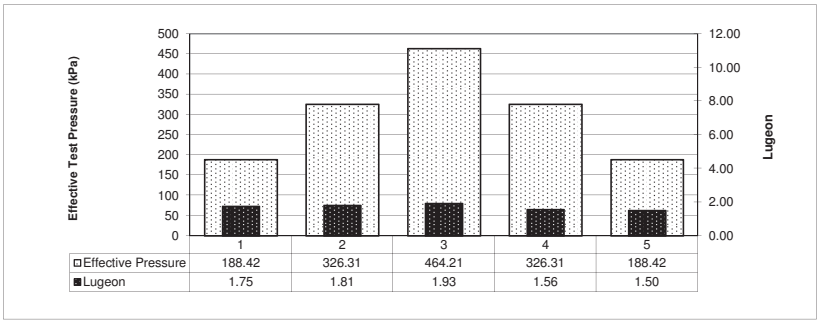
Gauge Pressure (psi)	Net Test Pressure (kPa)	Water Loss																Average flow (l/min)	Take (l/min/m)	Lugeon	Permeability (m/s)
20	188.42	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.74	0.33	1.75	1.76E-07
		Take (L/min)	0.780	0.770	0.770	0.760	0.760	0.740	0.760	0.700	0.750	0.730	0.750	0.740	0.710	0.720	0.710				
		Take (l/min)	0.780	0.770	0.770	0.760	0.760	0.740	0.760	0.700	0.750	0.730	0.750	0.740	0.710	0.720	0.710				
40	326.31	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	1.33	0.59	1.81	1.81E-07
		Take (L/min)	1.380	1.400	1.340	1.340	1.310	1.330	1.310	1.300	1.300	1.320	1.280	1.330	1.290						
		Take (l/min)	1.380	1.400	1.340	1.340	1.310	1.330	1.310	1.300	1.300	1.320	1.280	1.330	1.290	0.000	0.000				
60	464.21	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	2.01	0.89	1.93	1.93E-07
		Take (L/min)	2.030	2.030	1.970	2.030	2.020	2.020	1.980	2.020	2.010	2.000									
		Take (l/min)	2.030	2.030	1.970	2.030	2.020	2.020	1.980	2.020	2.010	2.000									
40	326.31	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	1.14	0.51	1.56	1.56E-07
		Take (L/min)	1.190	1.100	1.160	1.200	1.130	1.150	1.160	1.140	1.140	1.160	1.130	1.110	1.140	1.100	1.140				
		Take (l/min)	1.190	1.100	1.160	1.200	1.130	1.150	1.160	1.140	1.140	1.160	1.130	1.110	1.140	1.100	1.140				
20	188.42	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.64	0.28	1.50	1.51E-07
		Take (L/min)	0.640	0.640	0.650	0.650	0.620	0.630	0.650	0.630	0.640	0.630									
		Take (l/min)	0.640	0.640	0.650	0.650	0.620	0.630	0.650	0.630	0.640	0.630									

Test Pressure = Gauge pressure + static head - friction losses. **Note: friction losses ignored for this calculation.**

One Lugeon = 1 litre per minute per metre at a pressure of 10 bars.

K = Flow x ln(2 x Test Length/Hole diameter) / (2 x pi xTest length x Net head of water table at centre of test section) **Ref. Hoek and Bray.**





Approximate Permeability (m/s)

Min k =	1.6E-07
Max k =	1.9E-07
Avg K =	1.7E-07
Best fit K =	1.8E-07

Flow Type Interpretation

Laminar	Yes
Turbulant	No
Washout	No
Swelling	No
Hydrofracturing	No

Comments

Ground water depth taken prior to packer test.
Leak observed at 6 minute mark on 60 psi pressure interval (~100 mL/min)

PACKER TEST CALCULATION SHEET

Klohn Crippen Berger

PROJECT	AJAX GW Study	**PROJECT NO.**	M09871A01	**DATE**	31-Mar-14

Drill Hole ID KAX-14-114

Hole Plunge 90 deg

Test Interval from 67.34 m to 74 m

Test length 6.66 m

Hole diameter 0.096 m

True depth to ground water 2.77 m

Gauge height above ground 0.7 m

Ground surface elevation m

Static Head 34.04 kPa

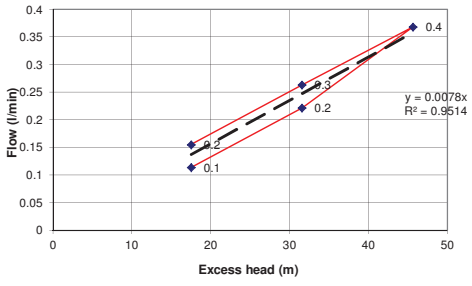
= (true gauge height (m) + groundwater depth (m)) x 9.81

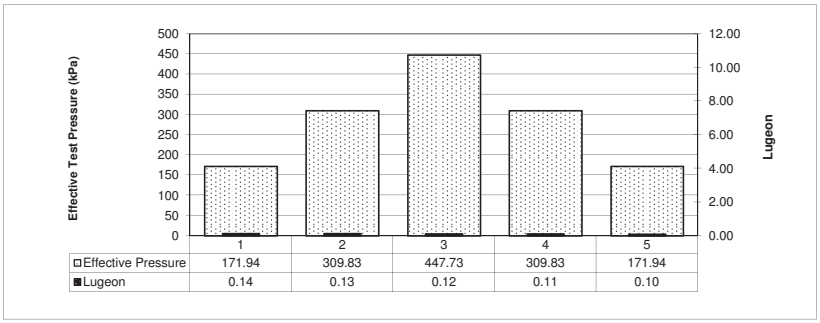
Gauge Pressure (psi)	Net Test Pressure (kPa)	Water Loss																Average flow (l/min)	Take (l/min/m)	Lugeon	Permeability (m/s)
20	171.94	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.16	0.02	0.14	1.74E-08
		Take (L/min)	0.160	0.180	0.160	0.150	0.160	0.160	0.150	0.160	0.140	0.160	0.140	0.160	0.150	0.150	0.150				
		Take (l/min)	0.160	0.180	0.160	0.150	0.160	0.160	0.150	0.160	0.140	0.160	0.140	0.160	0.150	0.150	0.150				
40	309.83	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.26	0.04	0.13	1.64E-08
		Take (L/min)	0.280	0.300	0.280	0.260	0.260	0.260	0.240	0.260	0.260	0.250	0.260	0.250	0.260						
		Take (l/min)	0.280	0.300	0.280	0.260	0.260	0.260	0.240	0.260	0.260	0.250	0.260	0.250	0.260	0.000	0.000				
60	447.73	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.37	0.06	0.12	1.59E-08
		Take (L/min)	0.380	0.380	0.380	0.340	0.340	0.380	0.380	0.380	0.380	0.360	0.360	0.360							
		Take (l/min)	0.380	0.380	0.380	0.340	0.340	0.380	0.380	0.380	0.380	0.360	0.360	0.360	0.000	0.000	0.000				
40	309.83	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.22	0.03	0.11	1.38E-08
		Take (L/min)	0.200	0.200	0.240	0.220	0.230	0.230	0.220	0.220	0.230	0.220	0.230	0.220	0.220	0.220					
		Take (l/min)	0.200	0.200	0.240	0.220	0.230	0.230	0.220	0.220	0.230	0.220	0.230	0.220	0.220	0.220	0.000				
20	171.94	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.11	0.02	0.10	1.28E-08
		Take (L/min)	0.110	0.110	0.100	0.100	0.120	0.100	0.120	0.120	0.130	0.120	0.120	0.120	0.110	0.110	0.120				
		Take (l/min)	0.110	0.110	0.100	0.100	0.120	0.100	0.120	0.120	0.130	0.120	0.120	0.120	0.110	0.110	0.120				

Test Pressure = Gauge pressure + static head - friction losses. **Note: friction losses ignored for this calculation.**

One Lugeon = 1 litre per minute per metre at a pressure of 10 bars.

K = Flow x ln(2 x Test Length/Hole diameter) / (2 x pi xTest length x Net head of water table at centre of test section) **Ref. Hoek and Bray.**





Approximate Permeability (m/s)

Min k =	1.4E-08
Max k =	1.7E-08
Avg K =	1.5E-08
Best fit K =	1.5E-08

Flow Type Interpretation

Laminar	Yes
Turbulant	No
Washout	No
Swelling	No
Hydrofracturing	No

Comments

Ground water depth taken prior to packer test.

PACKER TEST CALCULATION SHEET

Klohn Crippen Berger

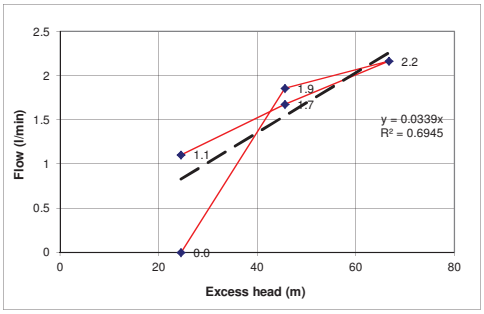
PROJECT	AJAX GW Study	**PROJECT NO.**	M09871A01
DATE	31-Mar-14		
Drill Hole ID	KAX-14-114	True depth to ground water	2.77 m
Hole Plunge	90 deg	Gauge height above ground	0.7 m
Test Interval from	85.75 m to 110 m	Ground surface elevation	m
Test length	24.25 m	Static Head	34.04 kPa
Hole diameter	0.096 m	= (true gauge height (m) + groundwater depth (m)) x 9.81	

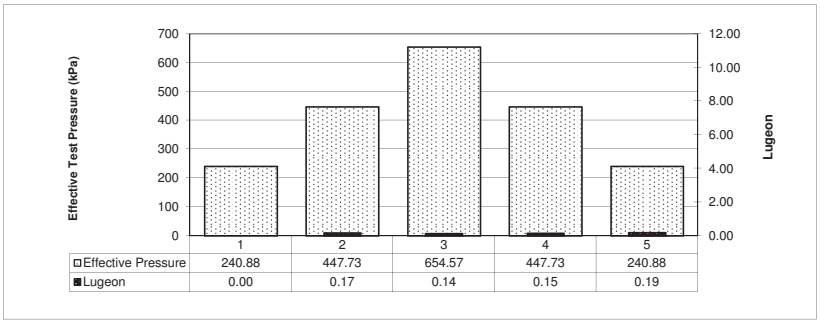
Gauge Pressure (psi)	Net Test Pressure (kPa)	Water Loss																Average flow (l/min)	Take (l/min/m)	Lugeon	Permeability (m/s)
30	240.88	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
		Take (L/min)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000				
		Take (l/min)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000				
60	447.73	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	1.86	0.08	0.17	2.77E-08
		Take (L/min)	1.820	1.840	1.840	1.850	1.860	1.850	1.870	1.890	1.840	1.890	1.860								
		Take (l/min)	1.820	1.840	1.840	1.850	1.860	1.850	1.870	1.890	1.840	1.890	1.860	0.000	0.000	0.000	0.000				
90	654.57	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	2.16	0.09	0.14	2.21E-08
		Take (L/min)	2.240	2.170	2.200	2.180	2.150	2.120	2.170	2.130	2.130	2.140	2.170								
		Take (l/min)	2.240	2.170	2.200	2.180	2.150	2.120	2.170	2.130	2.130	2.140	2.170	0.000	0.000	0.000	0.000				
60	447.73	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	1.68	0.07	0.15	2.50E-08
		Take (L/min)	1.660	1.700	1.690	1.690	1.710	1.680	1.690	1.670	1.640	1.650	1.650								
		Take (l/min)	1.660	1.700	1.690	1.690	1.710	1.680	1.690	1.670	1.640	1.650	1.650	0.000	0.000	0.000	0.000				
30	240.88	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	1.10	0.05	0.19	3.06E-08
		Take (L/min)	1.080	1.110	1.100	1.090	1.110	1.110	1.110	1.120	1.100	1.110									
		Take (l/min)	1.080	1.110	1.100	1.090	1.110	1.110	1.110	1.120	1.100	1.110	0.000	0.000	0.000	0.000	0.000				

Test Pressure = Gauge pressure + static head - friction losses. **Note: friction losses ignored for this calculation.**

One Lugeon = 1 litre per minute per metre at a pressure of 10 bars.

K = Flow x ln(2 x Test Length/Hole diameter) / (2 x pi xTest length x Net head of water table at centre of test section) **Ref. Hoek and Bray.**





Approximate Permeability (m/s)

Min k =	2.2E-08
Max k =	3.1E-08
Avg K =	2.6E-08
Best fit K =	2.3E-08

Flow Type Interpretation

Laminar	Yes
Turbulant	No
Washout	No
Swelling	No
Hydrofracturing	No

Comments

No flow/take observed in P1 30 psi pressurization stage.

PACKER TEST CALCULATION SHEET

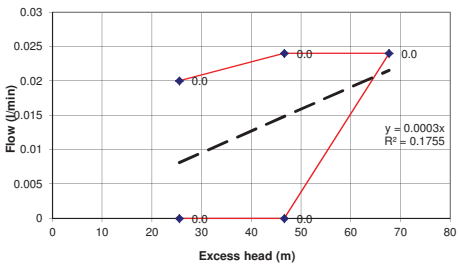
Klohn Crippen Berger

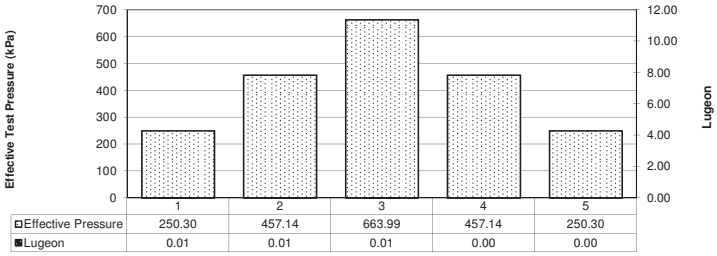
PROJECT	AJAX GW Study	**PROJECT NO.**	M09871A01
DATE	31-Mar-14		

Drill Hole ID	KAX-14-114	True depth to ground water	3.73 m
Hole Plunge	90 deg	Gauge height above ground	0.7 m
Test Interval from	79 m to 85 m	Ground surface elevation	m
Test length	6 m	Static Head	43.46 kPa
Hole diameter	0.096 m	= (true gauge height (m) + groundwater depth (m)) x 9.81	

Gauge Pressure (psi)	Net Test Pressure (kPa)	Water Loss																Average flow (l/min)	Take (l/min/m)	Lugeon	Permeability (m/s)
30	250.30	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.02	0.00	0.01	1.67E-09
		Take (L/min)	0.040	0.010	0.010	0.030	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000				
			230.420	230.430	230.440	230.470	230.480	230.480	230.480												
			230.380	230.420	230.430	230.440	230.470	230.480	230.480												
		Take (l/min)	0.040	0.010	0.010	0.030	0.010	0.000	0.000												
60	457.14	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.02	0.00	0.01	1.10E-09
		Take (L/min)	0.040	0.030	0.040	0.030	0.030	0.010	0.010	0.030	0.010	0.010									
			230.650	230.680	230.720	230.750	230.780	230.790	230.800	230.830	230.840	230.850									
			230.610	230.650	230.680	230.720	230.750	230.780	230.790	230.800	230.830	230.840									
		Take (l/min)	0.040	0.030	0.040	0.030	0.030	0.010	0.010	0.030	0.010	0.010									
90	663.99	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.02	0.00	0.01	7.57E-10
		Take (L/min)	0.020	0.020	0.030	0.030	0.030	0.040	0.010	0.010	0.040	0.010	0.020	0.020	0.030	0.020	0.030				
		Take (l/min)	0.020	0.020	0.030	0.030	0.030	0.040	0.010	0.010	0.040	0.010	0.020	0.020	0.030	0.020	0.030				
60	457.14	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
		Take (L/min)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000								
		Take (l/min)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000								
30	250.30	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
		Take (L/min)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000							
		Take (l/min)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000							

Test Pressure = Gauge pressure + static head - friction losses. **Note: friction losses ignored for this calculation.**
One Lugeon = 1 litre per minute per metre at a pressure of 10 bars.
K = Flow x ln(2 x Test Length/Hole diameter) / (2 x pi xTest length x Net head of water table at centre of test section) **Ref. Hoek and Bray.**





Approximate Permeability (m/s)

Min k =	7.6E-10
Max k =	1.7E-09
Avg K =	1.2E-09
Best fit K =	6.4E-10

Flow Type Interpretation

Laminar	Yes
Turbulant	No
Washout	No
Swelling	No
Hydrofracturing	No

Comments

No flow/take observed in P4 and P5 pressure stages
Average K excludes no-flow pressurization stages

PACKER TEST CALCULATION SHEET

Klohn Crippen Berger

PROJECT	AJAX GW Study	**PROJECT NO.**	M09871A01
DATE	31-Mar-14		

Drill Hole ID KAX-14-114

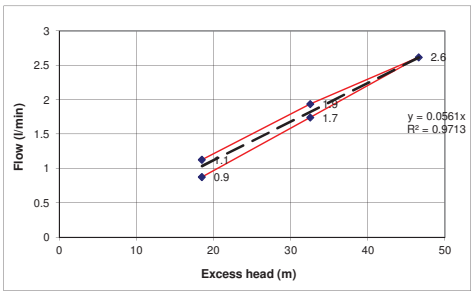
Hole Plunge	90 deg	True depth to ground water	3.73 m
Test Interval from	52 m to 59.5 m	Gauge height above ground	0.7 m
Test length	7.5 m	Ground surface elevation	m
Hole diameter	0.096 m	Static Head	43.46 kPa
		= (true gauge height (m) + groundwater depth (m)) x 9.81	

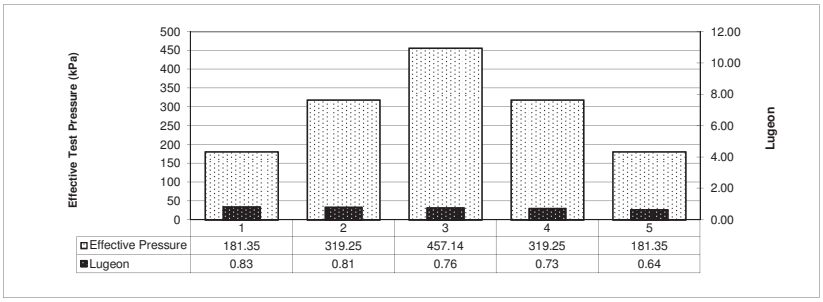
Gauge Pressure (psi)	Net Test Pressure (kPa)	Water Loss																Average flow (l/min)	Take (l/min/m)	Lugeon	Permeability (m/s)
20	181.35	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	1.13	0.15	0.83	1.09E-07
		Take (L/min)	1.180	1.130	1.150	1.130	1.150	1.150	1.100	1.110	1.130	1.110	1.110								
			313.730	314.860	316.010	317.140	318.290	319.440	320.540	321.650	322.780	323.890	325.000								
			312.550	313.730	314.860	316.010	317.140	318.290	319.440	320.540	321.650	322.780	323.890								
		Take (l/min)	1.180	1.130	1.150	1.130	1.150	1.150	1.100	1.110	1.130	1.110	1.110	0.000	0.000	0.000	0.000				
40	319.25	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	1.94	0.26	0.81	1.06E-07
		Take (L/min)	1.960	1.950	1.950	1.950	1.950	1.950	1.950	1.900	1.900	1.940	1.930								
			353.500	355.450	357.400	359.350	361.300	363.250	365.200	367.100	369.000	370.940	372.870								
			351.540	353.500	355.450	357.400	359.350	361.300	363.250	365.200	367.100	369.000	370.940								
		Take (l/min)	1.960	1.950	1.950	1.950	1.950	1.950	1.950	1.900	1.900	1.940	1.930								
60	457.14	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	2.62	0.35	0.76	1.01E-07
		Take (L/min)	2.660	2.690	2.690	2.700	2.610	2.620	2.610	2.590	2.610	2.600	2.580	2.580	2.560	2.600					
			393.360	396.050	398.740	401.440	404.050	406.670	409.28	411.87	414.48	417.08	419.66	422.24	424.8	427.4					
			390.700	393.360	396.050	398.740	401.440	404.050	406.670	409.280	411.870	414.480	417.080	419.660	422.240	424.800					
		Take (l/min)	2.660	2.690	2.690	2.700	2.610	2.620	2.610	2.590	2.610	2.600	2.580	2.580	2.560	2.600	0.000				
40	319.25	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	1.74	0.23	0.73	9.57E-08
		Take (L/min)	1.760	1.720	1.740	1.690	1.780	1.740	1.760	1.730	1.770	1.740									
		Take (l/min)	1.760	1.720	1.740	1.690	1.780	1.740	1.760	1.730	1.770	1.740	0.000	0.000	0.000	0.000	0.000				
20	181.35	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.88	0.12	0.64	8.47E-08
		Take (L/min)	0.750	0.870	0.900	0.880	0.870	0.900	0.900	0.900	0.900	0.890	0.880								
		Take (l/min)	0.750	0.870	0.900	0.880	0.870	0.900	0.900	0.900	0.900	0.890	0.880	0.000	0.000	0.000	0.000				

Test Pressure = Gauge pressure + static head - friction losses. **Note: friction losses ignored for this calculation.**

One Lugeon = 1 litre per minute per metre at a pressure of 10 bars.

K = Flow x ln(2 x Test Length/Hole diameter) / (2 x pi xTest length x Net head of water table at centre of test section) **Ref. Hoek and Bray.**





Approximate Permeability (m/s)

Min k =	8.5E-08
Max k =	1.1E-07
Avg K =	9.9E-08
Best fit K =	1.0E-07

Flow Type Interpretation

Laminar	Yes
Turbulant	No
Washout	No
Swelling	No
Hydrofracturing	No

Comments

PACKER TEST CALCULATION SHEET

Klohn Crippen Berger

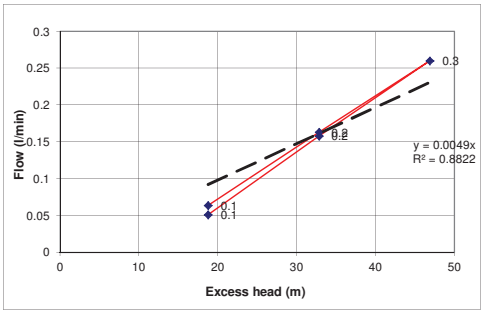
PROJECT	AJAX GW Study	**PROJECT NO.**	M09871A01	**DATE**	31-Mar-14
Drill Hole ID	KAX-14-114	True depth to ground water	3.73	m	
Hole Plunge	90 deg	Gauge height above ground	1	m	
Test Interval from	41 m to 47 m	Ground surface elevation		m	
Test length	6 m	Static Head	46.40	kPa	
Hole diameter	0.096 m	= (true gauge height (m) + groundwater depth (m)) x 9.81			

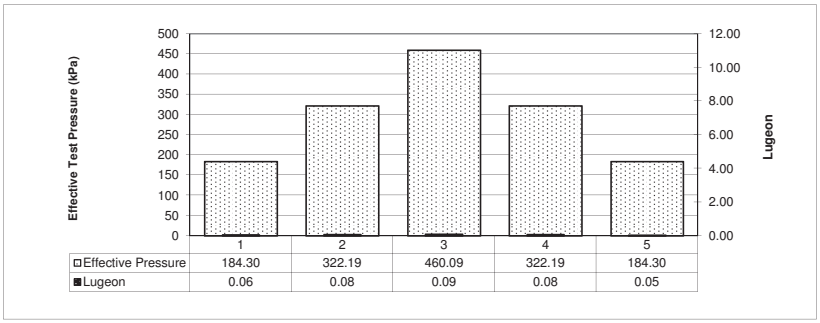
Gauge Pressure (psi)	Net Test Pressure (kPa)	Water Loss																Average flow (l/min)	Take (l/min/m)	Lugeon	Permeability (m/s)
20	184.30	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.06	0.01	0.06	7.23E-09
		Take (L/min)	0.080	0.070	0.050	0.060	0.070	0.070	0.060	0.060	0.060	0.060	0.060								
		Take (l/min)	0.080	0.070	0.050	0.060	0.070	0.070	0.060	0.060	0.060	0.060	0.060								
40	322.19	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.16	0.03	0.08	1.06E-08
		Take (L/min)	0.170	0.150	0.170	0.150	0.160	0.170	0.160	0.160	0.170	0.170									
		Take (l/min)	0.170	0.150	0.170	0.150	0.160	0.170	0.160	0.160	0.170	0.170									
60	460.09	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.26	0.04	0.09	1.18E-08
		Take (L/min)	0.260	0.240	0.260	0.260	0.260	0.260	0.270	0.260	0.270	0.260									
		Take (l/min)	0.260	0.240	0.260	0.260	0.260	0.260	0.270	0.260	0.270	0.260									
40	322.19	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.16	0.03	0.08	1.03E-08
		Take (L/min)	0.150	0.170	0.150	0.160	0.160	0.170	0.150	0.160	0.150	0.160									
		Take (l/min)	0.150	0.170	0.150	0.160	0.160	0.170	0.150	0.160	0.150	0.160									
20	184.30	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.05	0.01	0.05	5.79E-09
		Take (L/min)	0.050	0.050	0.060	0.050	0.050	0.050	0.050	0.050	0.050	0.050									
		Take (l/min)	0.050	0.050	0.060	0.050	0.050	0.050	0.050	0.050	0.050	0.050									

Test Pressure = Gauge pressure + static head - friction losses. **Note: friction losses ignored for this calculation.**

One Lugeon = 1 litre per minute per metre at a pressure of 10 bars.

K = Flow x ln(2 x Test Length/Hole diameter) / (2 x pi xTest length x Net head of water table at centre of test section) **Ref. Hoek and Bray.**





Approximate Permeability (m/s)

Min k =	5.8E-09
Max k =	1.2E-08
Avg K =	9.1E-09
Best fit K =	1.0E-08

Flow Type Interpretation

Laminar	Yes
Turbulant	No
Washout	No
Swelling	No
Hydrofracturing	No

Comments

PACKER TEST CALCULATION SHEET

Klohn Crippen Berger

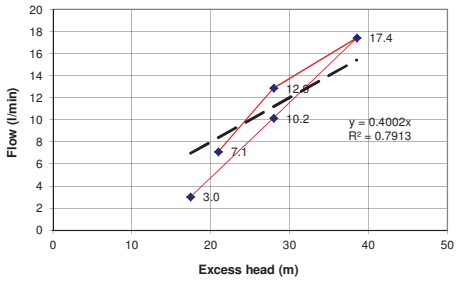
PROJECT	AJAX GW Study	**PROJECT NO.**	M09871A01
DATE	29-Apr-14		
Drill Hole ID	KAX-14-121	True depth to ground water	4.9 m
Hole Plunge	70 deg	Gauge height above ground	2 m
Test Interval from	14.45 m to 27.9 m	Ground surface elevation	m
Test length	13.45 m	Static Head	67.69 kPa
Hole diameter	0.096 m	= (true gauge height (m) + groundwater depth (m)) x 9.81	

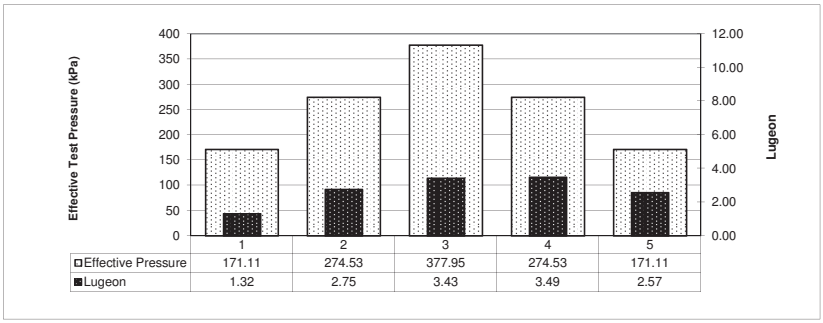
Gauge Pressure (psi)	Net Test Pressure (kPa)	Water Loss																Average flow (l/min)	Take (l/min/m)	Lugeon	Permeability (m/s)
15	171.11	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	3.04	0.23	1.32	2.02E-07
		Take (L/min)	3.00	3.05	3.15	2.95	2.90	3.05	3.10	3.10	3.05	3.05									
			481.25	484.30	487.45	490.40	493.30	496.35	499.45	502.55	505.60	508.65									
			478.25	481.25	484.30	487.45	490.40	493.30	496.35	499.45	502.55	505.60									
		Take (l/min)	3.00	3.05	3.15	2.95	2.90	3.05	3.10	3.10	3.05	3.05	0.00	0.00	0.00	0.00	0.00				
30	274.53	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	10.17	0.76	2.75	4.20E-07
		Take (L/min)	10.20	10.20	10.20	10.20	10.10	10.10	10.10	10.20	10.20	10.20									
			558.20	568.40	578.60	588.80	598.90	609.00	619.10	629.30	639.50	649.70									
			548.00	558.20	568.40	578.60	588.80	598.90	609.00	619.10	629.30	639.50									
		Take (l/min)	10.20	10.20	10.20	10.20	10.10	10.10	10.10	10.20	10.20	10.20	0.00	0.00	0.00						
45	377.95	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	17.43	1.30	3.43	5.23E-07
		Take (L/min)	17.40	17.50	17.50	18.00	18.00	17.20	17.70	17.30	17.10	17.60	17.30	16.70	17.30						
			771.90	789.40	806.90	824.90	842.90	860.10	877.80	895.10	912.20	929.80	947.10	963.80	981.10						
			754.50	771.90	789.40	806.90	824.90	842.90	860.10	877.80	895.10	912.20	929.80	947.10	963.80						
		Take (l/min)	17.40	17.50	17.50	18.00	18.00	17.20	17.70	17.30	17.10	17.60	17.30	16.70	17.30	0.00	0.00				
30	274.53	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	12.88	0.96	3.49	5.32E-07
		Take (L/min)	13.20	12.90	12.90	13.20	13.00	13.00	12.60	12.80	12.90	13.00	12.70	12.50	12.70	12.80	13.00				
			25.10	38.00	50.90	64.10	77.10	90.10	102.70	115.50	128.40	141.40	154.10	166.60	179.30	192.10	205.10				
			11.90	25.10	38.00	50.90	64.10	77.10	90.10	102.70	115.50	128.40	141.40	154.10	166.60	179.30	192.10				
		Take (l/min)	13.20	12.90	12.90	13.20	13.00	13.00	12.60	12.80	12.90	13.00	12.70	12.50	12.70	12.80	13.00				
20	205.58	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	7.10	0.53	2.57	3.92E-07
		Take (L/min)	7.25	7.15	7.20	7.05	7.05	7.00	7.15	7.15	7.05	7.10	7.00								
			196.75	203.90	211.10	218.15	225.20	232.20	239.35	246.50	253.55	260.65	267.65								
			189.50	196.75	203.90	211.10	218.15	225.20	232.20	239.35	246.50	253.55	260.65								
		Take (l/min)	7.25	7.15	7.20	7.05	7.05	7.00	7.15	7.15	7.05	7.10	7.00	0.00	0.00	0.00	0.00				

Test Pressure = Gauge pressure + static head - friction losses. **Note: friction losses ignored for this calculation.**

One Lugeon = 1 litre per minute per metre at a pressure of 10 bars.

K = Flow x ln(2 x Test Length/Hole diameter) / (2 x pi xTest length x Net head of water table at centre of test section) **Ref. Hoek and Bray.**





Approximate Permeability (m/s)

Min k =	2.0E-07
Max k =	5.3E-07
Avg K =	4.1E-07
Best fit K =	4.6E-07

Flow Type Interpretation

Laminar	Yes
Turbulant	No
Washout	No
Swelling	No
Hydrofracturing	No

Comments

Ground water depth taken prior to packer test.

PACKER TEST CALCULATION SHEET

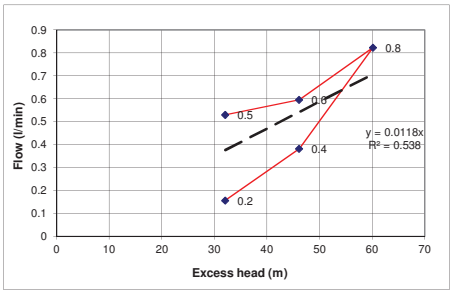
Klohn Crippen Berger

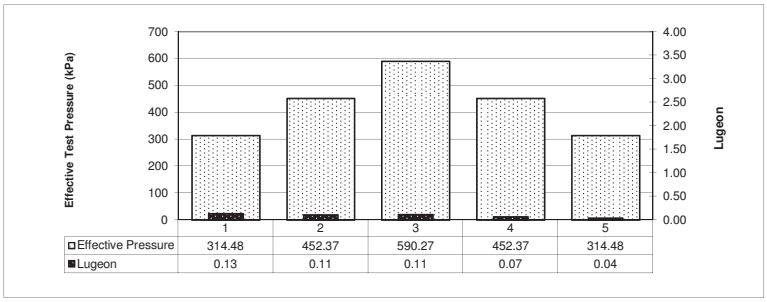
PROJECT	AJAX GW Study	**PROJECT NO.**	M09871A01
DATE	29-Apr-14		

Drill Hole ID	KAX-14-121	True depth to ground water	16 m
Hole Plunge	70 deg	Gauge height above ground	2 m
Test Interval from	36.4 m to 48.9 m	Ground surface elevation	m
Test length	12.5 m	Static Head	176.58 kPa
Hole diameter	0.096 m	= (true gauge height (m) + groundwater depth (m)) x 9.81	

Gauge Pressure (psi)	Net Test Pressure (kPa)	Water Loss																Average flow (l/min)	Take (l/min/m)	Lugeon	Permeability (m/s)
20	314.48	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.53	0.04	0.13	2.03E-08
		Take (L/min)	0.56	0.55	0.55	0.53	0.55	0.50	0.53	0.54	0.51	0.49	0.52								
			274.10	274.65	275.20	275.73	276.28	276.78	277.31	277.85	278.36	278.85	279.37								
			273.54	274.10	274.65	275.20	275.73	276.28	276.78	277.31	277.85	278.36	278.85								
		Take (l/min)	0.56	0.55	0.55	0.53	0.55	0.50	0.53	0.54	0.51	0.49	0.52	0.00	0.00	0.00	0.00				
40	452.37	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.60	0.05	0.11	1.59E-08
		Take (L/min)	0.63	0.63	0.63	0.62	0.61	0.61	0.62	0.56	0.59	0.59	0.55	0.54	0.57						
			281.33	281.96	282.59	283.21	283.82	284.43	285.05	285.61	286.20	286.79	287.34	287.88	288.45						
			280.70	281.33	281.96	282.59	283.21	283.82	284.43	285.05	285.61	286.20	286.79	287.34	287.88						
		Take (l/min)	0.63	0.63	0.63	0.62	0.61	0.61	0.62	0.56	0.59	0.59	0.55	0.54	0.57	0.00					
60	590.27	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.82	0.07	0.11	1.68E-08
		Take (L/min)	0.84	0.82	0.83	0.83	0.82	0.84	0.82	0.84	0.82	0.81	0.81	0.81							
			290.84	291.66	292.49	293.32	294.14	294.98	295.80	296.64	297.46	298.27	299.08	299.89							
			290.00	290.84	291.66	292.49	293.32	294.14	294.98	295.80	296.64	297.46	298.27	299.08							
		Take (l/min)	0.84	0.82	0.83	0.83	0.82	0.84	0.82	0.84	0.82	0.81	0.81	0.81							
40	452.37	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.38	0.03	0.07	1.02E-08
		Take (L/min)	0.33	0.36	0.37	0.39	0.39	0.39	0.38	0.39	0.39	0.39	0.40	0.38	0.40	0.39					
			300.63	300.99	301.36	301.75															
			300.30	300.63	300.99	301.36															
		Take (l/min)	0.33	0.36	0.37	0.39	0.39	0.39	0.38	0.39	0.39	0.39	0.40	0.38	0.40	0.39					
20	314.48	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.16	0.01	0.04	6.00E-09
		Take (L/min)	0.13	0.13	0.15	0.14	0.14	0.17	0.16	0.17	0.15	0.17	0.16	0.14	0.19	0.18	0.17				
			306.23	306.36	306.51	306.65	306.79	306.96	307.12	307.29	307.44	307.61	307.77	307.91	308.10	308.28	308.45				
			306.10	306.23	306.36	306.51	306.65	306.79	306.96	307.12	307.29	307.44	307.61	307.77	307.91	308.10	308.28				
		Take (l/min)	0.13	0.13	0.15	0.14	0.14	0.17	0.16	0.17	0.15	0.17	0.16	0.14	0.19	0.18	0.17				

Test Pressure = Gauge pressure + static head - friction losses. **Note: friction losses ignored for this calculation.**
One Lugeon = 1 litre per minute per metre at a pressure of 10 bars.
K = Flow x ln(2 x Test Length/Hole diameter) / (2 x pi xTest length x Net head of water table at centre of test section) **Ref. Hoek and Bray.**





Approximate Permeability (m/s)

Min k =	6.0E-09
Max k =	2.0E-08
Avg K =	1.4E-08
Best fit K =	1.4E-08

Flow Type Interpretation

Laminar	Yes
Turbulant	No
Washout	No
Swelling	No
Hydrofracturing	No

Comments

Ground water depth taken prior to packer test.

PACKER TEST CALCULATION SHEET

Klohn Crippen Berger

PROJECT	AJAX GW Study	**PROJECT NO.**	M09871A01
DATE	29-Apr-14		

Drill Hole ID KAX-14-121

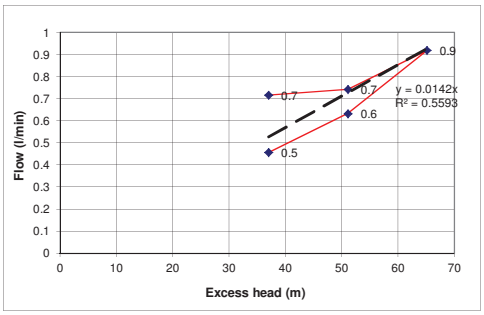
Hole Plunge	70 deg	True depth to ground water	20 m
Test Interval from	65.25 m to 72.9 m	Gauge height above ground	3 m
Test length	7.65 m	Ground surface elevation	m
Hole diameter	0.096 m	Static Head	225.63 kPa
		= (true gauge height (m) + groundwater depth (m)) x 9.81	

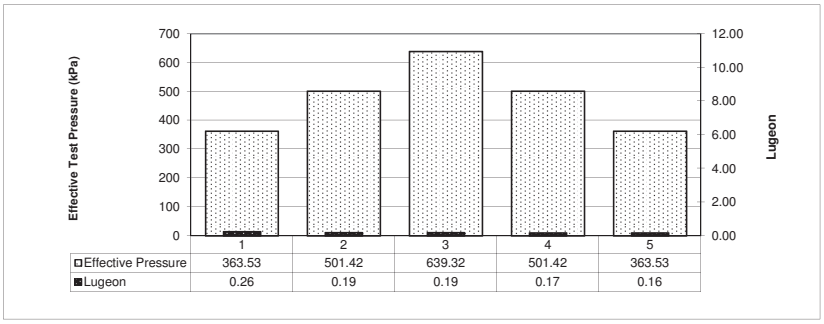
Gauge Pressure (psi)	Net Test Pressure (kPa)	Water Loss																Average flow (l/min)	Take (l/min/m)	Lugeon	Permeability (m/s)
20	363.53	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.72	0.09	0.26	3.53E-08
		Take (L/min)	0.77	0.77	0.76	0.75	0.73	0.73	0.73	0.71	0.70	0.70	0.70	0.69	0.65	0.66	0.70				
			543.37	544.14	544.90	545.65	546.38	547.11	547.84	548.55	549.25	549.95	550.65	551.34	551.99	552.65	553.35				
			542.60	543.37	544.14	544.90	545.65	546.38	547.11	547.84	548.55	549.25	549.95	550.65	551.34	551.99	552.65				
		Take (l/min)	0.77	0.77	0.76	0.75	0.73	0.73	0.73	0.71	0.70	0.70	0.70	0.69	0.65	0.66	0.70				
40	501.42	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.74	0.10	0.19	2.65E-08
		Take (L/min)	0.76	0.77	0.77	0.76	0.76	0.74	0.75	0.75	0.74	0.71	0.72	0.74	0.71	0.72	0.73				
			560.41	561.18	561.95	562.71	563.47	564.21	564.96	565.71	566.45	567.16	567.88	568.62	569.33	570.05	570.78				
			559.65	560.41	561.18	561.95	562.71	563.47	564.21	564.96	565.71	566.45	567.16	567.88	568.62	569.33	570.05				
		Take (l/min)	0.76	0.77	0.77	0.76	0.76	0.74	0.75	0.75	0.74	0.71	0.72	0.74	0.71	0.72	0.73				
60	639.32	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.92	0.12	0.19	2.57E-08
		Take (L/min)	0.95	0.95	0.94	0.93	0.92	0.90	0.92	0.91	0.90	0.90	0.91	0.90							
			577.66	578.61	579.55	580.48	581.40	582.30	583.22	584.13	585.03	585.93	586.84	587.74							
			576.71	577.66	578.61	579.55	580.48	581.40	582.30	583.22	584.13	585.03	585.93	586.84							
		Take (l/min)	0.95	0.95	0.94	0.93	0.92	0.90	0.92	0.91	0.90	0.90	0.91	0.90	0.00	0.00	0.00				
40	501.42	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.63	0.08	0.17	2.26E-08
		Take (L/min)	0.63	0.64	0.63	0.63	0.64	0.63	0.64	0.62	0.64	0.63									
			589.63	590.27	590.90	591.53	592.17	592.80	593.44	594.06	594.70	595.33									
			589.00	589.63	590.27	590.90	591.53	592.17	592.80	593.44	594.06	594.70									
		Take (l/min)	0.63	0.64	0.63	0.63	0.64	0.63	0.64	0.62	0.64	0.63									
20	363.53	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.46	0.06	0.16	2.25E-08
		Take (L/min)	0.44	0.45	0.46	0.45	0.46	0.47	0.45	0.47	0.46	0.46									
			596.63	597.08	597.54	597.99	598.45	598.92	599.37	599.84	600.30	600.76									
			596.19	596.63	597.08	597.54	597.99	598.45	598.92	599.37	599.84	600.30									
		Take (l/min)	0.44	0.45	0.46	0.45	0.46	0.47	0.45	0.47	0.46	0.46									

Test Pressure = Gauge pressure + static head - friction losses. **Note: friction losses ignored for this calculation.**

One Lugeon = 1 litre per minute per metre at a pressure of 10 bars.

K = Flow x ln(2 x Test Length/Hole diameter) / (2 x pi xTest length x Net head of water table at centre of test section) **Ref. Hoek and Bray.**





Approximate Permeability (m/s)

Min k =	2.3E-08
Max k =	3.5E-08
Avg K =	2.7E-08
Best fit K =	2.6E-08

Flow Type Interpretation

Laminar	Yes
Turbulant	No
Washout	No
Swelling	No
Hydrofracturing	No

Comments

Ground water depth taken prior to packer test.
No GW depth--> best fit X should be changed accordingly

PACKER TEST CALCULATION SHEET

Klohn Crippen Berger

PROJECT	AJAX GW Study	**PROJECT NO.**	M09871A01
DATE	11-Apr-14		

Drill Hole ID KAX-14-121

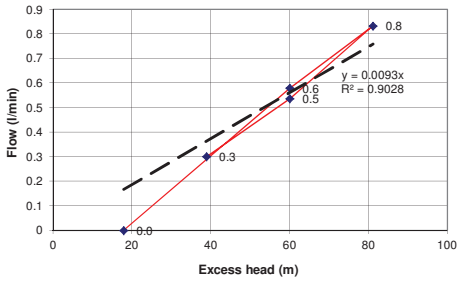
Hole Plunge	70 deg	True depth to ground water	16 m
Test Interval from	99.65 m to 129.9 m	Gauge height above ground	1.9 m
Test length	30.25 m	Ground surface elevation	m
Hole diameter	0.096 m	Static Head	175.60 kPa
		= (true gauge height (m) + groundwater depth (m)) x 9.81	

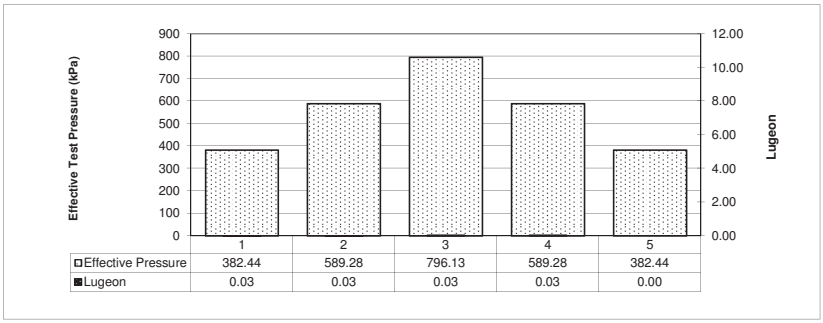
Gauge Pressure (psi)	Net Test Pressure (kPa)	Water Loss																Average flow (l/min)	Take (l/min/m)	Lugeon	Permeability (m/s)
30	382.44	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.30	0.01	0.03	4.55E-09
		Take (L/min)	0.32	0.29	0.29	0.28	0.30	0.29	0.29	0.31	0.30	0.30	0.31	0.31	0.30	0.32					
			680.32	680.61	680.90	681.18	681.48	681.77	682.06	682.37	682.67	682.97	683.28	683.59	683.89	684.21					
			680.00	680.32	680.61	680.90	681.18	681.48	681.77	682.06	682.37	682.67	682.97	683.28	683.59	683.89					
		Take (l/min)	0.32	0.29	0.29	0.28	0.30	0.29	0.29	0.31	0.30	0.30	0.31	0.31	0.30	0.32					
60	589.28	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.54	0.02	0.03	5.27E-09
		Take (L/min)	0.54	0.53	0.56	0.55	0.56	0.57	0.57	0.54	0.46	0.51	0.52	0.53	0.53	0.54	0.54				
			688.70	689.23	689.79	690.34	690.90	691.47	692.04	692.58	693.04	693.55	694.07	694.60	695.13	695.67	696.21				
			688.16	688.70	689.23	689.79	690.34	690.90	691.47	692.04	692.58	693.04	693.55	694.07	694.60	695.13	695.67				
		Take (l/min)	0.54	0.53	0.56	0.55	0.56	0.57	0.57	0.54	0.46	0.51	0.52	0.53	0.53	0.54	0.54				
90	796.13	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.83	0.03	0.03	6.05E-09
		Take (L/min)	0.81	0.80	0.82	0.81	0.81	0.81	0.82	0.84	0.84	0.84	0.85	0.88	0.88	0.86	0.82				
			702.67	703.47	704.29	705.10	705.91	706.72	707.54	708.38	709.22	710.06	710.91	711.79	712.66	713.52	714.34				
			701.86	702.67	703.47	704.29	705.10	705.91	706.72	707.54	708.38	709.22	710.06	710.91	711.79	712.66	713.52				
		Take (l/min)	0.81	0.80	0.82	0.81	0.81	0.81	0.82	0.84	0.84	0.84	0.85	0.88	0.88	0.86	0.82				
60	589.28	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.58	0.02	0.03	5.69E-09
		Take (L/min)	0.49	0.52	0.51	0.52	0.57	0.56	0.56	0.55	0.58	0.58	0.60	0.63	0.63	0.66	0.73				
											721.69	722.27	722.87	723.50	724.13	724.79	725.52				
											721.11	721.69	722.27	722.87	723.50	724.13	724.79				
		Take (l/min)	0.49	0.52	0.51	0.52	0.57	0.56	0.56	0.55	0.58	0.58	0.60	0.63	0.63	0.66	0.73				
	175.60	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
		Take (L/min)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00									
		Take (l/min)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00									

Test Pressure = Gauge pressure + static head - friction losses. **Note: friction losses ignored for this calculation.**

One Lugeon = 1 litre per minute per metre at a pressure of 10 bars.

K = Flow x ln(2 x Test Length/Hole diameter) / (2 x pi xTest length x Net head of water table at centre of test section) **Ref. Hoek and Bray.**





Approximate Permeability (m/s)

Min k =	4.6E-09
Max k =	6.0E-09
Avg K =	5.3E-09
Best fit K =	5.5E-09

Flow Type Interpretation

Laminar	Yes
Turbulant	No
Washout	No
Swelling	No
Hydrofracturing	No

Comments

Ground water depth taken prior to packer test.

PACKER TEST CALCULATION SHEET

Klohn Crippen Berger

PROJECT	AJAX GW Study	**PROJECT NO.**	M09871A01
DATE	29-Apr-14		

Drill Hole ID KAX-14-121

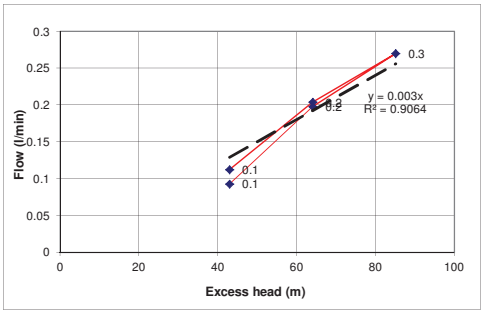
Hole Plunge	70 deg	True depth to ground water	20 m
Test Interval from	125.15 m to 129.9 m	Gauge height above ground	1.9 m
Test length	4.75 m	Ground surface elevation	m
Hole diameter	0.096 m	Static Head	214.84 kPa
		= (true gauge height (m) + groundwater depth (m)) x 9.81	

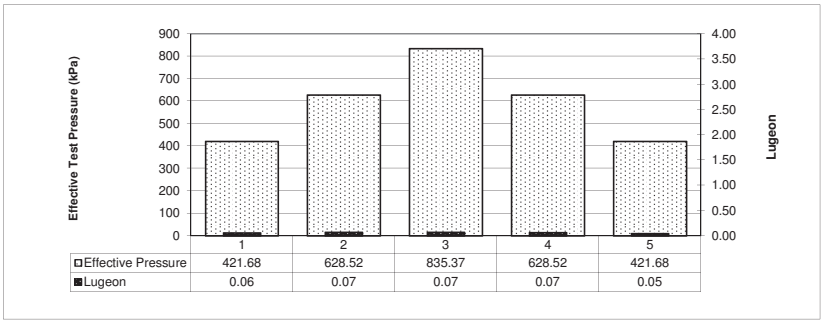
Gauge Pressure (psi)	Net Test Pressure (kPa)	Water Loss																Average flow (l/min)	Take (l/min/m)	Lugeon	Permeability (m/s)
30	421.68	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.11	0.02	0.06	6.94E-09
		Take (L/min)	0.11	0.12	0.11	0.11	0.12	0.12	0.12	0.10	0.13	0.11	0.11	0.11	0.10	0.10	0.11				
			248.89	249.01	249.12	249.23	249.35	249.47	249.59	249.69	249.82	249.93	250.04	250.15	250.25	250.35	250.46				
			248.78	248.89	249.01	249.12	249.23	249.35	249.47	249.59	249.69	249.82	249.93	250.04	250.15	250.25	250.35				
		Take (l/min)	0.11	0.12	0.11	0.11	0.12	0.12	0.12	0.10	0.13	0.11	0.11	0.11	0.10	0.10	0.11				
60	628.52	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.20	0.04	0.07	8.46E-09
		Take (L/min)	0.23	0.22	0.22	0.21	0.20	0.19	0.22	0.20	0.20	0.20	0.19	0.20	0.19	0.19	0.20				
			251.01	251.23	251.45	251.66	251.86	252.05	252.27	252.47	252.67	252.87	253.06	253.26	253.45	253.64	253.84				
			250.78	251.01	251.23	251.45	251.66	251.86	252.05	252.27	252.47	252.67	252.87	253.06	253.26	253.45	253.64				
		Take (l/min)	0.23	0.22	0.22	0.21	0.20	0.19	0.22	0.20	0.20	0.20	0.19	0.20	0.19	0.19	0.20				
90	835.37	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.27	0.06	0.07	8.42E-09
		Take (L/min)	0.28	0.28	0.27	0.27	0.28	0.27	0.28	0.27	0.27	0.25	0.27	0.26	0.27	0.27	0.26				
			254.48	254.76	255.03	255.30	255.58	255.85	256.13	256.40	256.67	256.92	257.19	257.45	257.72	257.99	258.25				
			254.20	254.48	254.76	255.03	255.30	255.58	255.85	256.13	256.40	256.67	256.92	257.19	257.45	257.72	257.99				
		Take (l/min)	0.28	0.28	0.27	0.27	0.28	0.27	0.28	0.27	0.27	0.25	0.27	0.26	0.27	0.27	0.26				
60	628.52	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.20	0.04	0.07	8.20E-09
		Take (L/min)	0.18	0.19	0.20	0.21	0.20	0.20	0.19	0.20	0.21	0.19	0.20	0.20	0.20	0.20					
			258.73	258.92	259.12	259.33	259.53	259.73	259.92	260.12	260.33	260.52	260.72	260.92	261.12	261.32					
			258.55	258.73	258.92	259.12	259.33	259.53	259.73	259.92	260.12	260.33	260.52	260.72	260.92	261.12					
		Take (l/min)	0.18	0.19	0.20	0.21	0.20	0.20	0.19	0.20	0.21	0.19	0.20	0.20	0.20	0.20					
30	421.68	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.09	0.02	0.05	5.73E-09
		Take (L/min)	0.09	0.09	0.09	0.08	0.09	0.10	0.08	0.09	0.10	0.09	0.11	0.08	0.10	0.10	0.10				
			261.64	261.73	261.82	261.90	261.99	262.09	262.17	262.26	262.36	262.45	262.56	262.64	262.74	262.84	262.94				
			261.55	261.64	261.73	261.82	261.90	261.99	262.09	262.17	262.26	262.36	262.45	262.56	262.64	262.74	262.84				
		Take (l/min)	0.09	0.09	0.09	0.08	0.09	0.10	0.08	0.09	0.10	0.09	0.11	0.08	0.10	0.10	0.10				

Test Pressure = Gauge pressure + static head - friction losses. Note: friction losses ignored for this calculation.

One Lugeon = 1 litre per minute per metre at a pressure of 10 bars.

K = Flow x ln(2 x Test Length/Hole diameter) / (2 x pi xTest length x Net head of water table at centre of test section) Ref. Hoek and Bray.





Approximate Permeability (m/s)

Min k =	5.7E-09
Max k =	8.5E-09
Avg K =	7.6E-09
Best fit K =	8.0E-09

Flow Type Interpretation

Laminar	Yes
Turbulant	No
Washout	No
Swelling	No
Hydrofracturing	No

Comments

Ground water depth taken prior to packer test.

PACKER TEST CALCULATION SHEET

Klohn Crippen Berger

PROJECT	AJAX GW Study	**PROJECT NO.**	M09871A01
DATE	29-Apr-14		

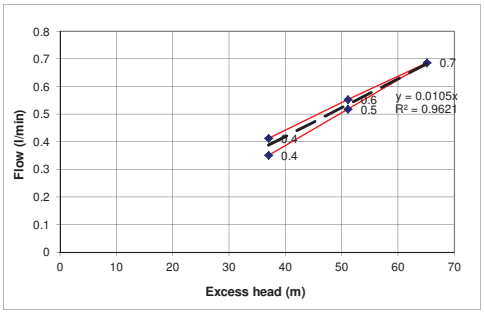
Drill Hole ID	KAX-14-121	True depth to ground water	20 m
Hole Plunge	70 deg	Gauge height above ground	3 m
Test Interval from	142.15 m to 150.9 m	Ground surface elevation	m
Test length	8.75 m	Static Head	225.63 kPa
Hole diameter	0.096 m	= (true gauge height (m) + groundwater depth (m)) x 9.81	

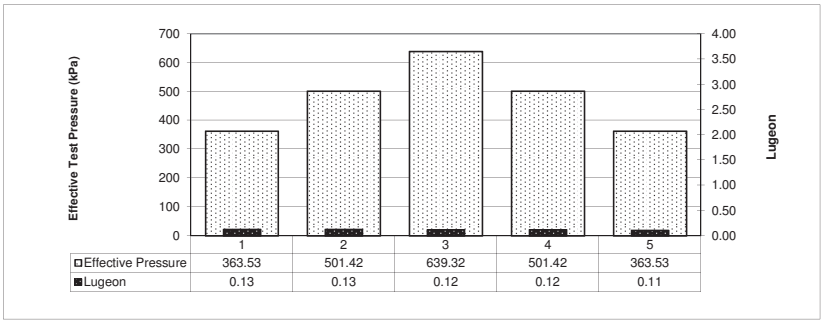
Gauge Pressure (psi)	Net Test Pressure (kPa)	Water Loss																Average flow (l/min)	Take (l/min/m)	Lugeon	Permeability (m/s)
		Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14				
		Take (L/min)	0.44	0.42	0.44	0.44	0.40	0.40	0.41	0.40	0.40	0.40	0.40								
20	363.53		373.34	373.76	374.20	374.64	375.04	375.44	375.85	376.25	376.65	377.05	377.45					0.41	0.05	0.13	1.83E-08
			372.90	373.34	373.76	374.20	374.64	375.04	375.44	375.85	376.25	376.65	377.05								
		Take (l/min)	0.44	0.42	0.44	0.44	0.40	0.40	0.41	0.40	0.40	0.40	0.40	0.00	0.00	0.00	0.00				
		Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14				
		Take (L/min)	0.59	0.55	0.51	0.66	0.58	0.59	0.56	0.57	0.53	0.51	0.55	0.49	0.52	0.53					
40	501.42		379.20	379.75	380.26	380.92	381.50	382.09	382.65	383.22	383.75	384.26	384.81	385.30	385.82	386.35		0.55	0.06	0.13	1.77E-08
			378.61	379.20	379.75	380.26	380.92	381.50	382.09	382.65	383.22	383.75	384.26	384.81	385.30	385.82					
		Take (l/min)	0.59	0.55	0.51	0.66	0.58	0.59	0.56	0.57	0.53	0.51	0.55	0.49	0.52	0.53					
		Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14				
		Take (L/min)	0.70	0.66	0.72	0.68	0.69	0.66	0.70	0.69	0.67	0.69									
60	639.32		388.39	389.05	389.77	390.45	391.14	391.80	392.50	393.19	393.86	394.55						0.69	0.08	0.12	1.73E-08
			387.69	388.39	389.05	389.77	390.45	391.14	391.80	392.50	393.19	393.86									
		Take (l/min)	0.70	0.66	0.72	0.68	0.69	0.66	0.70	0.69	0.67	0.69									
		Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14				
		Take (L/min)	0.54	0.54	0.51	0.53	0.51	0.54	0.51	0.51	0.51	0.50	0.51								
40	501.42		396.19	396.73	397.24	397.77	398.28	398.82	399.33	399.84	400.35	400.85	401.36					0.52	0.06	0.12	1.66E-08
			395.65	396.19	396.73	397.24	397.77	398.28	398.82	399.33	399.84	400.35	400.85								
		Take (l/min)	0.54	0.54	0.51	0.53	0.51	0.54	0.51	0.51	0.51	0.50	0.51								
		Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14				
		Take (L/min)	0.37	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.00	0.00	0.00	0.00	0.00				
20	363.53		402.05	402.40	402.75	403.10	403.45	403.80	404.15	404.50	404.85	405.20						0.35	0.04	0.11	1.56E-08
			401.68	402.05	402.40	402.75	403.10	403.45	403.80	404.15	404.50	404.85									
		Take (l/min)	0.37	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35									

Test Pressure = Gauge pressure + static head - friction losses. **Note: friction losses ignored for this calculation.**

One Lugeon = 1 litre per minute per metre at a pressure of 10 bars.

K = Flow x ln(2 x Test Length/Hole diameter) / (2 x pi xTest length x Net head of water table at centre of test section) **Ref. Hoek and Bray.**





Approximate Permeability (m/s)

Min k =	1.6E-08
Max k =	1.8E-08
Avg K =	1.7E-08
Best fit K =	1.7E-08

Flow Type Interpretation

Laminar	Yes
Turbulant	No
Washout	No
Swelling	No
Hydrofracturing	No

Comments

Ground water depth estimated.

PACKER TEST CALCULATION SHEET

Klohn Crippen Berger

PROJECT	AJAX GW Study	**PROJECT NO.**	M09871A01
DATE	29-Apr-14		

Drill Hole ID KAX-14-121

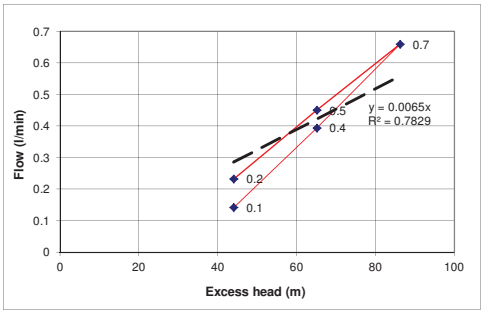
Hole Plunge	70 deg	True depth to ground water	20 m
Test Interval from	110.25 m to 150.9 m	Gauge height above ground	3 m
Test length	40.65 m	Ground surface elevation	m
Hole diameter	0.096 m	Static Head	225.63 kPa
		= (true gauge height (m) + groundwater depth (m)) x 9.81	

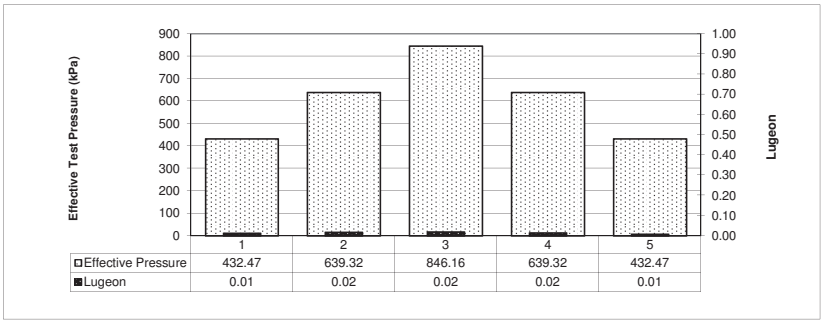
Gauge Pressure (psi)	Net Test Pressure (kPa)	Water Loss																Average flow (l/min)	Take (l/min/m)	Lugeon	Permeability (m/s)
30	432.47	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.23	0.01	0.01	2.42E-09
		Take (L/min)	0.20	0.26	0.23	0.25	0.24	0.23	0.24	0.23	0.22	0.22	0.24	0.23							
			845.61	845.87	846.10	846.35	846.59	846.82	847.53	847.76	847.98	848.20	848.44	848.67							
			845.41	845.61	845.87	846.10	846.35	846.59	847.29	847.53	847.76	847.98	848.20	848.44							
		Take (l/min)	0.20	0.26	0.23	0.25	0.24	0.23	0.24	0.23	0.22	0.22	0.24	0.23	0.00	0.00					
60	639.32	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.45	0.01	0.02	3.18E-09
		Take (L/min)	0.47	0.44	0.48	0.45	0.46	0.45	0.47	0.45	0.46	0.41	0.44	0.44	0.44						
			852.47	852.91	853.39	853.84	854.30	854.75	855.22	855.67	856.13	856.54	856.98	857.42	857.86						
			852.00	852.47	852.91	853.39	853.84	854.30	854.75	855.22	855.67	856.13	856.54	856.98	857.42						
		Take (l/min)	0.47	0.44	0.48	0.45	0.46	0.45	0.47	0.45	0.46	0.41	0.44	0.44	0.44	0.00	0.00				
90	846.16	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.66	0.02	0.02	3.51E-09
		Take (L/min)	0.66	0.70	0.65	0.65	0.66	0.65	0.66	0.65	0.65	0.66									
			871.89	872.59	873.24	873.89	874.55	875.20	875.86	876.51	877.16	877.82									
			871.23	871.89	872.59	873.24	873.89	874.55	875.20	875.86	876.51	877.16									
		Take (l/min)	0.66	0.70	0.65	0.65	0.66	0.65	0.66	0.65	0.65	0.66	0.00	0.00	0.00	0.00	0.00				
60	639.32	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.39	0.01	0.02	2.78E-09
		Take (L/min)	0.38	0.37	0.39	0.40	0.40	0.40	0.40	0.40	0.40	0.40									
			878.80	879.17	879.56	879.96	880.36	880.76	881.16	881.56	881.96	882.36									
			878.42	878.80	879.17	879.56	879.96	880.36	880.76	881.16	881.56	881.96									
		Take (l/min)	0.38	0.37	0.39	0.40	0.40	0.40	0.40	0.40	0.40	0.40									
30	432.47	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.14	0.00	0.01	1.48E-09
		Take (L/min)	0.11	0.12	0.12	0.15	0.15	0.13	0.17	0.13	0.16	0.16	0.15	0.15	0.15						
			882.56	882.68	882.80	882.95	883.10	883.23	883.40	883.53	883.69	883.85	884.00	884.15	884.30						
			882.45	882.56	882.68	882.80	882.95	883.10	883.23	883.40	883.53	883.69	883.85	884.00	884.15						
		Take (l/min)	0.11	0.12	0.12	0.15	0.15	0.13	0.17	0.13	0.16	0.16	0.15	0.15	0.15						

Test Pressure = Gauge pressure + static head - friction losses. **Note: friction losses ignored for this calculation.**

One Lugeon = 1 litre per minute per metre at a pressure of 10 bars.

K = Flow x ln(2 x Test Length/Hole diameter) / (2 x pi xTest length x Net head of water table at centre of test section) **Ref. Hoek and Bray.**





Approximate Permeability (m/s)

Min k =	1.5E-09
Max k =	3.5E-09
Avg K =	2.7E-09
Best fit K =	3.0E-09

Flow Type Interpretation

Laminar	Yes
Turbulant	No
Washout	No
Swelling	No
Hydrofracturing	No

Comments

Ground water depth estimated.

PACKER TEST CALCULATION SHEET

Klohn Crippen Berger

PROJECT	AJAX GW Study	**PROJECT NO.**	M09871A01	**DATE**	29-Apr-14

Drill Hole ID KAX-14-121

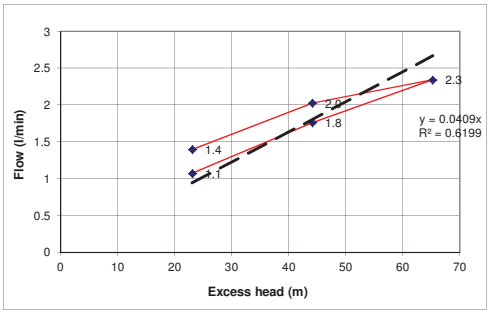
Hole Plunge	70 deg	True depth to ground water	m
Test Interval from	118 m to 122.5 m	Gauge height above ground	2 m
Test length	4.5 m	Ground surface elevation	m
Hole diameter	0.096 m	Static Head	19.62 kPa
		= (true gauge height (m) + groundwater depth (m)) x 9.81	

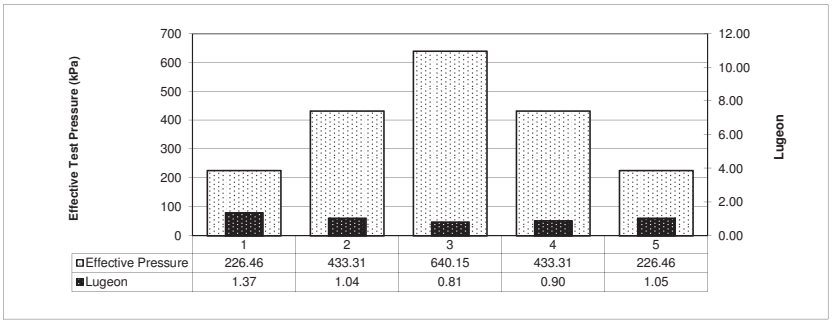
Gauge Pressure (psi)	Net Test Pressure (kPa)	Water Loss																Average flow (l/min)	Take (l/min/m)	Lugeon	Permeability (m/s)
30	226.46	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	1.40	0.31	1.37	1.68E-07
		Take (L/min)	1.46	1.44	1.40	1.41	1.39	1.38	1.40	1.38	1.35	1.39	1.39								
			523.33	524.77	526.17	527.58	528.97	530.35	531.75	533.13	534.48	535.87	537.26								
			521.87	523.33	524.77	526.17	527.58	528.97	530.35	531.75	533.13	534.48	535.87								
		Take (l/min)	1.46	1.44	1.40	1.41	1.39	1.38	1.40	1.38	1.35	1.39	1.39	0.00	0.00	0.00	0.00				
60	433.31	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	2.03	0.45	1.04	1.27E-07
		Take (L/min)	2.08	2.01	2.06	2.02	2.03	2.01	2.02	2.02	2.02	2.02	2.01								
			559.97	561.98	564.04	566.06	568.09	570.10	572.12	574.14	576.16	578.18	580.19								
			557.89	559.97	561.98	564.04	566.06	568.09	570.10	572.12	574.14	576.16	578.18								
		Take (l/min)	2.08	2.01	2.06	2.02	2.03	2.01	2.02	2.02	2.02	2.02	2.01	0.00	0.00	0.00	0.00				
90	640.15	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	2.34	0.52	0.81	9.94E-08
		Take (L/min)	2.37	2.38	2.37	2.32	2.32	2.35	2.35	2.31	2.32	2.33									
			614.46	616.84	619.21	621.53	623.85	626.20	628.55	630.86	633.18	635.51									
			612.09	614.46	616.84	619.21	621.53	623.85	626.20	628.55	630.86	633.18									
		Take (l/min)	2.37	2.38	2.37	2.32	2.32	2.35	2.35	2.31	2.32	2.33	0.00	0.00	0.00	0.00	0.00				
60	433.31	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	1.76	0.39	0.90	1.10E-07
		Take (L/min)	1.79	1.78	1.75	1.77	1.79	1.75	1.76	1.75	1.75	1.73	1.76	1.76							
			641.05	642.83	644.58	646.35	648.14	649.89	651.65	653.40	655.15	656.88	658.64	660.40							
			639.26	641.05	642.83	644.58	646.35	648.14	649.89	651.65	653.40	655.15	656.88	658.64							
		Take (l/min)	1.79	1.78	1.75	1.77	1.79	1.75	1.76	1.75	1.75	1.73	1.76	1.76							
30	226.46	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	1.07	0.24	1.05	1.29E-07
		Take (L/min)	1.09	1.07	1.07	1.07	1.08	1.07	1.07	1.08	1.07	1.07									
			662.74	663.81	664.88	665.95	667.03	668.10	669.17	670.25	671.32	672.39									
			661.65	662.74	663.81	664.88	665.95	667.03	668.10	669.17	670.25	671.32									
		Take (l/min)	1.09	1.07	1.07	1.07	1.08	1.07	1.07	1.08	1.07	1.07									

Test Pressure = Gauge pressure + static head - friction losses. **Note: friction losses ignored for this calculation.**

One Lugeon = 1 litre per minute per metre at a pressure of 10 bars.

K = Flow x ln(2 x Test Length/Hole diameter) / (2 x pi xTest length x Net head of water table at centre of test section) **Ref. Hoek and Bray.**





Approximate Permeability (m/s)

Min k =	9.9E-08
Max k =	1.7E-07
Avg K =	1.3E-07
Best fit K =	1.1E-07

Flow Type Interpretation

Laminar	Yes
Turbulant	No
Washout	No
Swelling	No
Hydrofracturing	No

Comments

PACKER TEST CALCULATION SHEET

Klohn Crippen Berger

PROJECT	AJAX GW Study	**PROJECT NO.**	M09871A01	**DATE**	29-Apr-14

Drill Hole ID KAX-14-121

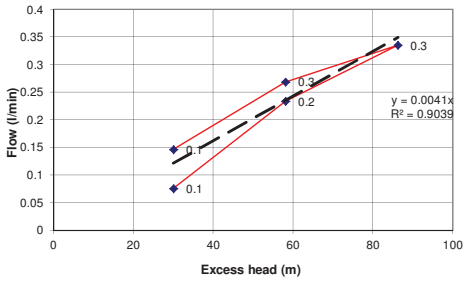
Hole Plunge	70 deg	True depth to ground water	m
Test Interval from	105 m to 114 m	Gauge height above ground	1.9 m
Test length	9 m	Ground surface elevation	m
Hole diameter	0.096 m	Static Head	18.64 kPa
		= (true gauge height (m) + groundwater depth (m)) x 9.81	

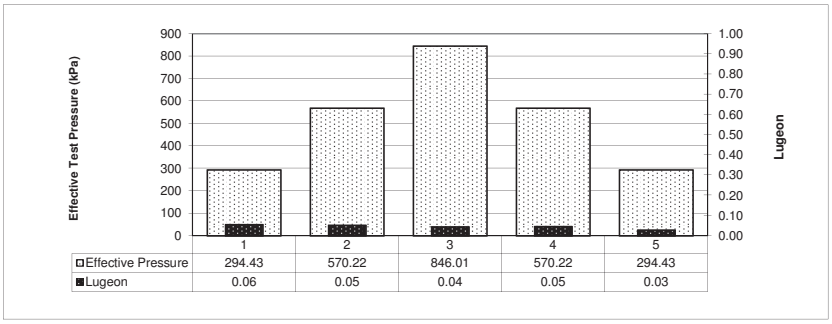
Gauge Pressure (psi)	Net Test Pressure (kPa)	Water Loss																Average flow (l/min)	Take (l/min/m)	Lugeon	Permeability (m/s)
40	294.43	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.15	0.02	0.06	7.83E-09
		Take (L/min)	0.15	0.16	0.17	0.11	0.13	0.14	0.16	0.15	0.15	0.13	0.14	0.15	0.16	0.15	0.15				
			831.50	831.66	831.83	831.94	832.07	832.21	832.37	832.52	832.67	832.80	832.94	833.09	833.25	833.40	833.55				
			831.35	831.50	831.66	831.83	831.94	832.07	832.21	832.37	832.52	832.67	832.80	832.94	833.09	833.25	833.40				
		Take (l/min)	0.15	0.16	0.17	0.11	0.13	0.14	0.16	0.15	0.15	0.13	0.14	0.15	0.16	0.15	0.15				
80	570.22	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.27	0.03	0.05	7.40E-09
		Take (L/min)	0.29	0.29	0.27	0.27	0.26	0.28	0.26	0.27	0.27	0.26	0.26	0.27	0.26	0.25					
			834.22	834.51	834.78	835.05	835.31	835.59	835.85	836.12	836.39	836.65	836.91	837.18	837.44	837.69					
			833.93	834.22	834.51	834.78	835.05	835.31	835.59	835.85	836.12	836.39	836.65	836.91	837.18	837.44					
		Take (l/min)	0.29	0.29	0.27	0.27	0.26	0.28	0.26	0.27	0.27	0.26	0.26	0.27	0.26	0.25					
120	846.01	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.34	0.04	0.04	6.23E-09
		Take (L/min)	0.35	0.35	0.34	0.34	0.34	0.34	0.34	0.33	0.34	0.32	0.33	0.33	0.33	0.33	0.32				
			839.89	840.24	840.58	840.92	841.26	841.60	841.94	842.27	842.61	842.93	843.26	843.59	843.92	844.25	844.57				
			839.54	839.89	840.24	840.58	840.92	841.26	841.60	841.94	842.27	842.61	842.93	843.26	843.59	843.92	844.25				
		Take (l/min)	0.35	0.35	0.34	0.34	0.34	0.34	0.34	0.33	0.34	0.32	0.33	0.33	0.33	0.33	0.32				
80	570.22	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.23	0.03	0.05	6.45E-09
		Take (L/min)	0.25	0.23	0.24	0.23	0.24	0.24	0.24	0.23	0.23	0.23	0.23	0.24	0.23	0.23	0.22				
			844.99	845.22	845.46	845.69	845.93	846.17	846.41	846.64	846.87	847.10	847.33	847.57	847.80	848.03	848.25				
			844.74	844.99	845.22	845.46	845.69	845.93	846.17	846.41	846.64	846.87	847.10	847.33	847.57	847.80	848.03				
		Take (l/min)	0.25	0.23	0.24	0.23	0.24	0.24	0.24	0.23	0.23	0.23	0.23	0.24	0.23	0.23	0.22				
40	294.43	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.08	0.01	0.03	4.06E-09
		Take (L/min)	0.06	0.02	0.12	0.11	0.05	0.03	0.11	0.10	0.11	0.14	0.12	0.08	0.01	0.02	0.06				
			848.58	848.60	848.72	848.83	848.88	848.91	849.02	849.12	849.23	849.37	849.49	849.57	849.58	849.60	849.66				
			848.52	848.58	848.60	848.72	848.83	848.88	848.91	849.02	849.12	849.23	849.37	849.49	849.57	849.58	849.60				
		Take (l/min)	0.06	0.02	0.12	0.11	0.05	0.03	0.11	0.10	0.11	0.14	0.12	0.08	0.01	0.02	0.06				

Test Pressure = Gauge pressure + static head - friction losses. **Note: friction losses ignored for this calculation.**

One Lugeon = 1 litre per minute per metre at a pressure of 10 bars.

K = Flow x ln(2 x Test Length/Hole diameter) / (2 x pi xTest length x Net head of water table at centre of test section) **Ref. Hoek and Bray.**





Approximate Permeability (m/s)

Min k =	4.1E-09
Max k =	7.8E-09
Avg K =	6.4E-09
Best fit K =	6.6E-09

Flow Type Interpretation

Laminar	Yes
Turbulant	No
Washout	No
Swelling	No
Hydrofracturing	No

Comments

PACKER TEST CALCULATION SHEET

Klohn Crippen Berger

PROJECT	AJAX GW Study	**PROJECT NO.**	M09871A01	**DATE**	29-Apr-14

Drill Hole ID KAX-14-121

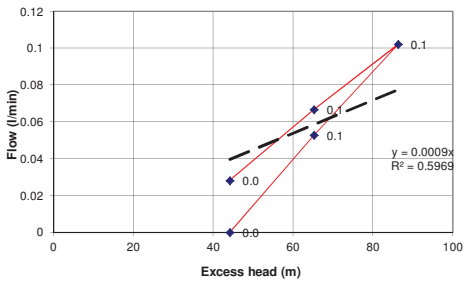
Hole Plunge	70 deg	True depth to ground water	m
Test Interval from	46 m to 48 m	Gauge height above ground	2 m
Test length	2 m	Ground surface elevation	m
Hole diameter	0.096 m	Static Head	19.62 kPa
		= (true gauge height (m) + groundwater depth (m)) x 9.81	

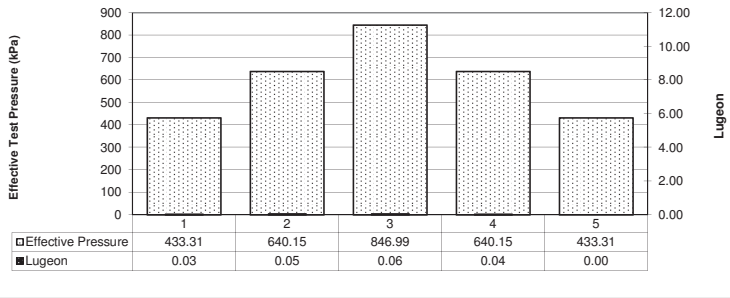
Gauge Pressure (psi)	Net Test Pressure (kPa)	Water Loss																Average flow (l/min)	Take (l/min/m)	Lugeon	Permeability (m/s)
60	433.31	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.03	0.01	0.03	3.25E-09
		Take (L/min)	0.02	0.05	0.05	0.01	0.05	0.00	0.00	0.03	0.03	0.01	0.01	0.04	0.00	0.01	0.00				
			969.47	969.52	969.57	969.58	969.63	969.63	969.63	969.66	969.69	969.70	969.71	969.75	969.75	969.76	969.76				
			969.45	969.47	969.52	969.57	969.58	969.63	969.63	969.63	969.66	969.69	969.70	969.71	969.75	969.75	969.76				
		Take (l/min)	0.02	0.05	0.05	0.01	0.05	0.00	0.00	0.03	0.03	0.01	0.01	0.04	0.00	0.01	0.00				
90	640.15	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.07	0.03	0.05	5.20E-09
		Take (L/min)	0.08	0.06	0.08	0.07	0.06	0.05	0.07	0.06	0.07	0.06	0.07	0.07							
			970.03	970.09	970.17	970.24	970.30	970.35	970.42	970.48	970.55	970.61	970.68	970.75							
			969.95	970.03	970.09	970.17	970.24	970.30	970.35	970.42	970.48	970.55	970.61	970.68							
		Take (l/min)	0.08	0.06	0.08	0.07	0.06	0.05	0.07	0.06	0.07	0.06	0.07	0.07							
120	846.99	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.10	0.05	0.06	6.02E-09
		Take (L/min)	0.10	0.10	0.12	0.14	0.10	0.10	0.09	0.10	0.09	0.09	0.10	0.09	0.11	0.10					
			971.29	971.39	971.51	971.65	971.75	971.85	971.94	972.04	972.13	972.22	972.32	972.41	972.52	972.62					
			971.19	971.29	971.39	971.51	971.65	971.75	971.85	971.94	972.04	972.13	972.22	972.32	972.41	972.52					
		Take (l/min)	0.10	0.10	0.12	0.14	0.10	0.10	0.09	0.10	0.09	0.09	0.10	0.09	0.11	0.10	0.00				
90	640.15	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.05	0.03	0.04	4.11E-09
		Take (L/min)	0.06	0.06	0.05	0.06	0.05	0.06	0.05	0.04	0.05	0.05	0.05								
			972.78	972.84	972.89	972.95	973.00	973.06	973.11	973.15	973.20	973.25	973.30								
			972.72	972.78	972.84	972.89	972.95	973.00	973.06	973.11	973.15	973.20	973.25								
		Take (l/min)	0.06	0.06	0.05	0.06	0.05	0.06	0.05	0.04	0.05	0.05	0.05								
60	433.31	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
		Take (L/min)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00											
			973.30	973.30	973.30	973.30	973.30	973.30	973.30	973.30											
			973.30	973.30	973.30	973.30	973.30	973.30	973.30	973.30											
		Take (l/min)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00											

Test Pressure = Gauge pressure + static head - friction losses. **Note: friction losses ignored for this calculation.**

One Lugeon = 1 litre per minute per metre at a pressure of 10 bars.

K = Flow x ln(2 x Test Length/Hole diameter) / (2 x pi xTest length x Net head of water table at centre of test section) **Ref. Hoek and Bray.**





Approximate Permeability (m/s)

Min k =	3.2E-09
Max k =	6.0E-09
Avg K =	4.6E-09
Best fit K =	4.6E-09

Flow Type Interpretation

Laminar	Yes
Turbulant	No
Washout	No
Swelling	No
Hydrofracturing	No

Comments

Average K excludes P5 pressure stage (no flow).

PACKER TEST CALCULATION SHEET

Klohn Crippen Berger

PROJECT	AJAX GW Study	**PROJECT NO.**	M09871A01
DATE	30-Mar-14		

Drill Hole ID KAX-14-124

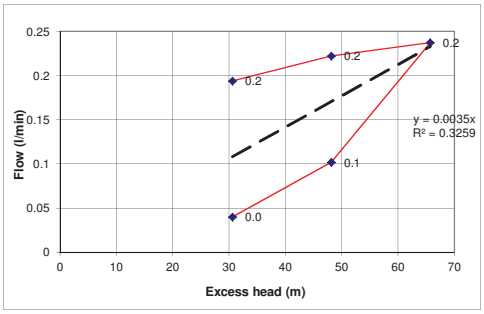
Hole Plunge	70 deg	True depth to ground water	11.23 m
Test Interval from	33.75 – 43 m	Gauge height above ground	1.8 m
Test length	9.25 m	Ground surface elevation	m
Hole diameter	0.096 m	Static Head	127.82 kPa
		= (true gauge height (m) + groundwater depth (m)) x 9.81	

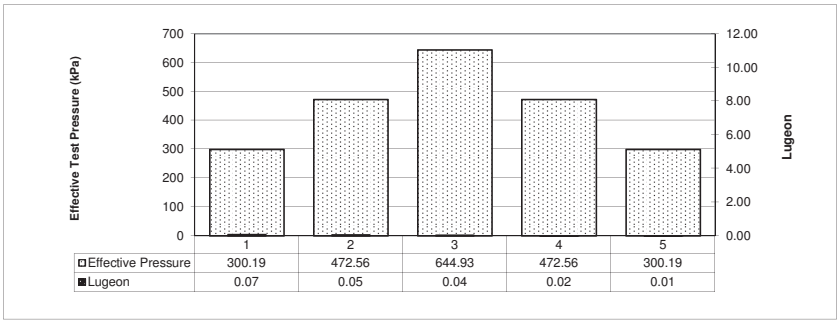
Gauge Pressure (psi)	Net Test Pressure (kPa)	Water Loss																Average flow (l/min)	Take (l/min/m)	Lugeon	Permeability (m/s)
25	300.19	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.19	0.02	0.07	9.94E-09
		Take (L/min)	0.20	0.19	0.20	0.20	0.20	0.17	0.20	0.19	0.19	0.20									
			975.80	975.99	976.19	976.39	976.59	976.76	976.96	977.15	977.34	977.54									
			975.60	975.80	975.99	976.19	976.39	976.59	976.76	976.96	977.15	977.34									
		Take (l/min)	0.20	0.19	0.20	0.20	0.20	0.17	0.20	0.19	0.19	0.20									
50	472.56	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.22	0.02	0.05	7.22E-09
		Take (L/min)	0.24	0.25	0.23	0.23	0.23	0.23	0.23	0.22	0.21	0.23	0.20	0.22	0.20	0.21	0.20				
			979.25	979.50	979.73	979.96	980.19	980.42	980.65	980.87	981.08	981.31	981.51	981.73	981.93	982.14	982.34				
			979.01	979.25	979.50	979.73	979.96	980.19	980.42	980.65	980.87	981.08	981.31	981.51	981.73	981.93	982.14				
		Take (l/min)	0.24	0.25	0.23	0.23	0.23	0.23	0.23	0.22	0.21	0.23	0.20	0.22	0.20	0.21	0.20				
75	644.93	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.24	0.03	0.04	5.66E-09
		Take (L/min)	0.26	0.26	0.25	0.25	0.24	0.26	0.24	0.24	0.22	0.23	0.22	0.22	0.23	0.22	0.22				
			985.34	985.60	985.85	986.10	986.34	986.60	986.84	987.08	987.30	987.53	987.75	987.97	988.20	988.42	988.64				
			985.08	985.34	985.60	985.85	986.10	986.34	986.60	986.84	987.08	987.30	987.53	987.75	987.97	988.20	988.42				
		Take (l/min)	0.26	0.26	0.25	0.25	0.24	0.26	0.24	0.24	0.22	0.23	0.22	0.22	0.23	0.22	0.22				
50	472.56	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.10	0.01	0.02	3.32E-09
		Take (L/min)	0.07	0.13	0.12	0.12	0.12	0.12	0.10	0.08	0.12	0.10	0.09	0.07	0.10	0.10	0.09				
			988.71	988.84	988.96	989.08	989.20	989.32	989.42	989.50	989.62	989.72	989.81	989.88	989.98	990.08	990.17				
			988.64	988.71	988.84	988.96	989.08	989.20	989.32	989.42	989.50	989.62	989.72	989.81	989.88	989.98	990.08				
		Take (l/min)	0.07	0.13	0.12	0.12	0.12	0.12	0.10	0.08	0.12	0.10	0.09	0.07	0.10	0.10	0.09				
25	300.19	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.04	0.00	0.01	2.05E-09
		Take (L/min)	0.05	0.05	0.04	0.03	0.05	0.04	0.03	0.04	0.07	0.03	0.04	0.05	0.02	0.05	0.01				
			990.71	990.76	990.80	990.83	990.88	990.92	990.95	990.99	991.06	991.09	991.13	991.18	991.20	991.25	991.26				
			990.66	990.71	990.76	990.80	990.83	990.88	990.92	990.95	990.99	991.06	991.09	991.13	991.18	991.20	991.25				
		Take (l/min)	0.05	0.05	0.04	0.03	0.05	0.04	0.03	0.04	0.07	0.03	0.04	0.05	0.02	0.05	0.01				

Test Pressure = Gauge pressure + static head - friction losses. Note: friction losses ignored for this calculation.

One Lugeon = 1 litre per minute per metre at a pressure of 10 bars.

K = Flow x ln(2 x Test Length/Hole diameter) / (2 x pi xTest length x Net head of water table at centre of test section) Ref. Hoek and Bray.





Approximate Permeability (m/s)

Min k =	2.0E-09
Max k =	9.9E-09
Avg K =	5.6E-09
Best fit K =	5.5E-09

Flow Type Interpretation

Laminar	Yes
Turbulant	No
Washout	No
Swelling	No
Hydrofracturing	No

Comments

Ground water depth taken prior to packer test.

PACKER TEST CALCULATION SHEET

Klohn Crippen Berger

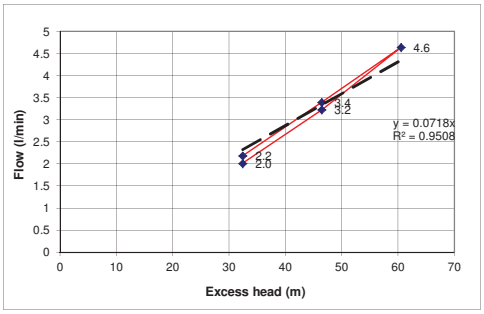
PROJECT	AJAX GW Study	**PROJECT NO.**	M09871A01
DATE	29-Apr-14		
Drill Hole ID	KAX-14-124	True depth to ground water	16.56 m
Hole Plunge	70 deg	Gauge height above ground	1.8 m
Test Interval from	44.25 m to 50.5 m	Ground surface elevation	m
Test length	6.25 m	Static Head	180.11 kPa
Hole diameter	0.096 m	= (true gauge height (m) + groundwater depth (m)) x 9.81	

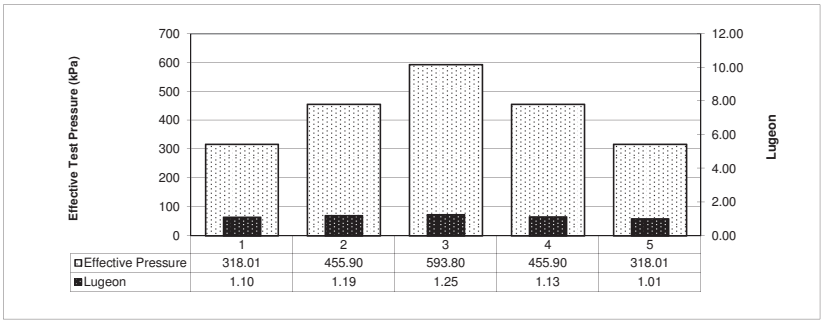
Gauge Pressure (psi)	Net Test Pressure (kPa)	Water Loss																Average flow (l/min)	Take (l/min/m)	Lugeon	Permeability (m/s)
20	318.01	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	2.18	0.35	1.10	1.44E-07
		Take (L/min)	2.16	2.15	2.18	2.20	2.18	2.22	2.18	2.19	2.14	2.11	2.20	2.31	2.16	2.19	2.18				
			96.09	98.24	100.42	102.62	104.80	107.02	109.20	111.39	113.53	115.64	117.84	120.15	122.31	124.50	126.68				
			93.93	96.09	98.24	100.42	102.62	104.80	107.02	109.20	111.39	113.53	115.64	117.84	120.15	122.31	124.50				
		Take (l/min)	2.16	2.15	2.18	2.20	2.18	2.22	2.18	2.19	2.14	2.11	2.20	2.31	2.16	2.19	2.18				
40	455.90	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	3.40	0.54	1.19	1.57E-07
		Take (L/min)	3.41	3.43	3.56	3.52	3.40	3.37	3.33	3.39	3.35	3.35	3.35	3.30							
			155.50	158.93	162.49	166.01	169.41	172.78	176.11	179.50	182.85	186.20	189.55	192.85							
			152.09	155.50	158.93	162.49	166.01	169.41	172.78	176.11	179.50	182.85	186.20	189.55							
		Take (l/min)	3.41	3.43	3.56	3.52	3.40	3.37	3.33	3.39	3.35	3.35	3.35	3.30	0.00						
60	593.80	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	4.64	0.74	1.25	1.64E-07
		Take (L/min)	4.90	4.80	4.80	4.80	4.50	4.60	4.50	4.60	4.60	4.50	4.60	4.50	4.60						
			213.80	218.60	223.40	228.20	232.70	237.30	241.80	246.40	251.00	255.50	260.10	264.60	269.20						
			208.90	213.80	218.60	223.40	228.20	232.70	237.30	241.80	246.40	251.00	255.50	260.10	264.60						
		Take (l/min)	4.90	4.80	4.80	4.80	4.50	4.60	4.50	4.60	4.60	4.50	4.60	4.50	4.60						
40	455.90	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	3.22	0.52	1.13	1.49E-07
		Take (L/min)	2.95	3.05	3.10	3.20	3.20	3.30	3.25	3.25	3.25	3.25	3.25	3.35	3.30	3.30	3.35				
			279.15	282.20	285.30	288.50	291.70	295.00	298.25	301.50	304.75	308.00	311.25	314.60	317.90	321.20	324.55				
			276.20	279.15	282.20	285.30	288.50	291.70	295.00	298.25	301.50	304.75	308.00	311.25	314.60	317.90	321.20				
		Take (l/min)	2.95	3.05	3.10	3.20	3.20	3.30	3.25	3.25	3.25	3.25	3.25	3.35	3.30	3.30	3.35				
20	318.01	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	2.01	0.32	1.01	1.33E-07
		Take (L/min)	1.90	1.95	1.97	2.00	2.03	2.00	2.05	2.02	2.05	2.08	2.05	2.07							
			336.10	338.05	340.02	342.02	344.05	346.05	348.10	350.12	352.17	354.25	356.30	358.37							
			334.20	336.10	338.05	340.02	342.02	344.05	346.05	348.10	350.12	352.17	354.25	356.30							
		Take (l/min)	1.90	1.95	1.97	2.00	2.03	2.00	2.05	2.02	2.05	2.08	2.05	2.07	0.00	0.00	0.00				

Test Pressure = Gauge pressure + static head - friction losses. **Note: friction losses ignored for this calculation.**

One Lugeon = 1 litre per minute per metre at a pressure of 10 bars.

K = Flow x ln(2 x Test Length/Hole diameter) / (2 x pi xTest length x Net head of water table at centre of test section) **Ref. Hoek and Bray.**





Approximate Permeability (m/s)

Min k =	1.3E-07
Max k =	1.6E-07
Avg K =	1.5E-07
Best fit K =	1.5E-07

Flow Type Interpretation

Laminar	Yes
Turbulant	No
Washout	No
Swelling	No
Hydrofracturing	No

Comments

Ground water depth taken prior to packer test.

PACKER TEST CALCULATION SHEET

Klohn Crippen Berger

PROJECT	AJAX GW Study	**PROJECT NO.**	M09871A01	**DATE**	29-Apr-14

Drill Hole ID KAX-14-124

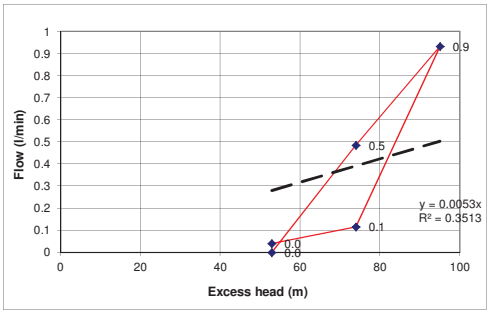
Hole Plunge	70 deg	True depth to ground water	30 m
Test Interval from	57.75 m to 65.5 m	Gauge height above ground	1.8 m
Test length	7.75 m	Ground surface elevation	m
Hole diameter	0.096 m	Static Head	311.96 kPa
		= (true gauge height (m) + groundwater depth (m)) x 9.81	

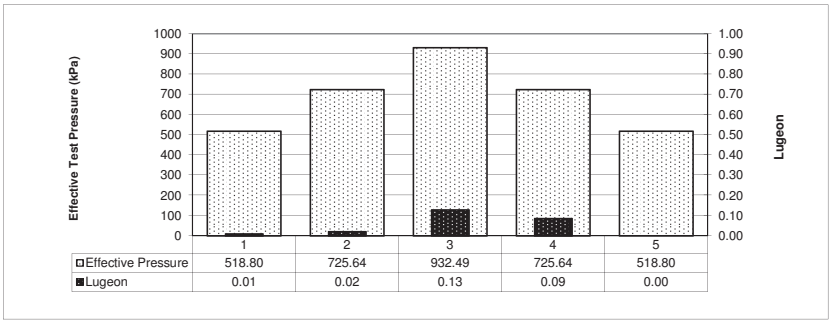
Gauge Pressure (psi)	Net Test Pressure (kPa)	Water Loss																Average flow (l/min)	Take (l/min/m)	Lugeon	Permeability (m/s)
30	518.80	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.04	0.01	0.01	1.37E-09
		Take (L/min)	0.00	0.06	0.00	0.00	0.06	0.04	0.02	0.02	0.07	0.03	0.00	0.02							
			372.54	372.60	372.60	372.60	372.66	372.70	372.72	372.74	372.81	372.84	372.84	372.86							
			372.54	372.54	372.60	372.60	372.60	372.66	372.70	372.72	372.74	372.81	372.84	372.84							
		Take (l/min)	0.00	0.06	0.00	0.00	0.06	0.04	0.02	0.02	0.07	0.03	0.00	0.02	0.00	0.00					
60	725.64	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.12	0.01	0.02	2.81E-09
		Take (L/min)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.12						
			374.32	374.32	374.32	374.32	374.32	374.32	374.32	374.32	374.32	374.32	374.32	374.43	374.43	374.55					
			374.32	374.32	374.32	374.32	374.32	374.32	374.32	374.32	374.32	374.32	374.32	374.43	374.43						
		Take (l/min)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.12	0.00	0.00				
90	932.49	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.93	0.12	0.13	1.77E-08
		Take (L/min)	0.93	0.95	0.93	0.93	0.95	0.94	0.92	0.97	0.92	0.91	0.92	0.95	0.89	0.96	0.91				
			376.50	377.45	378.38	379.31	380.26	381.20	382.12	383.09	384.01	384.92	385.84	386.79	387.68	388.64	389.55				
			375.57	376.50	377.45	378.38	379.31	380.26	381.20	382.12	383.09	384.01	384.92	385.84	386.79	387.68	388.64				
		Take (l/min)	0.93	0.95	0.93	0.93	0.95	0.94	0.92	0.97	0.92	0.91	0.92	0.95	0.89	0.96	0.91				
60	725.64	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.48	0.06	0.09	1.18E-08
		Take (L/min)	0.33	0.58	0.58	0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00								
			389.88	390.46	391.04	391.49	391.49	391.49	391.49	391.49	391.49	391.49	391.49								
			389.55	389.88	390.46	391.04	391.49	391.49	391.49	391.49	391.49	391.49	391.49								
		Take (l/min)	0.33	0.58	0.58	0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
30	518.80	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.00	0.00	0.00	0.00E+00
		Take (L/min)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00										
			391.49	391.49	391.49	391.49	391.49	391.49	391.49	391.49	391.49										
			391.49	391.49	391.49	391.49	391.49	391.49	391.49	391.49	391.49										
		Take (l/min)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00										

Test Pressure = Gauge pressure + static head - friction losses. **Note: friction losses ignored for this calculation.**

One Lugeon = 1 litre per minute per metre at a pressure of 10 bars.

K = Flow x ln(2 x Test Length/Hole diameter) / (2 x pi xTest length x Net head of water table at centre of test section) **Ref. Hoek and Bray.**





Approximate Permeability (m/s)

Min k =	1.4E-09
Max k =	1.8E-08
Avg K =	8.4E-09
Best fit K =	9.6E-09

Flow Type Interpretation

Laminar	Yes
Turbulant	No
Washout	No
Swelling	No
Hydrofracturing	No

Comments

Ground water depth taken prior to packer test.
Average K excludes P5 pressure stage (no flow).

PACKER TEST CALCULATION SHEET

Klohn Crippen Berger

PROJECT	AJAX GW Study	**PROJECT NO.**	M09871A01	**DATE**	29-Apr-14

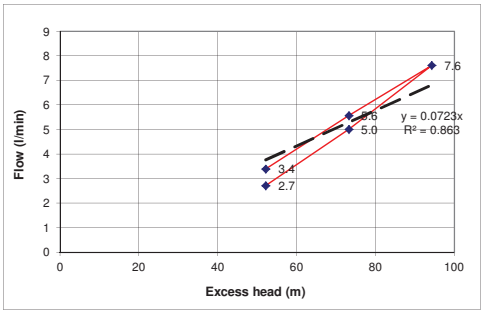
Drill Hole ID	KAX-14-124	True depth to ground water	30 m
Hole Plunge	70 deg	Gauge height above ground	1.07 m
Test Interval from	71.25 m to 83.5 m	Ground surface elevation	m
Test length	12.25 m	Static Head	304.80 kPa
Hole diameter	0.096 m	= (true gauge height (m) + groundwater depth (m)) x 9.81	

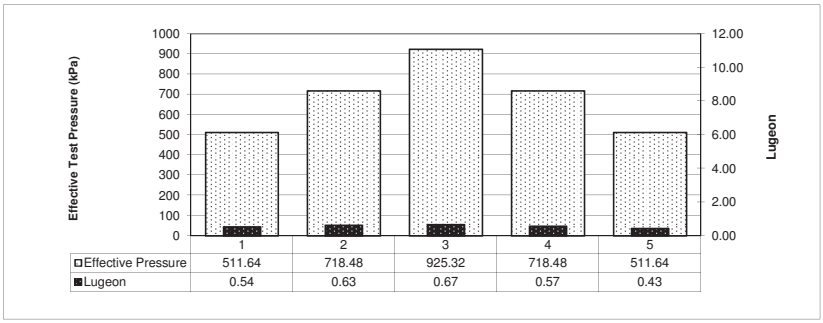
Gauge Pressure (psi)	Net Test Pressure (kPa)	Water Loss																Average flow (l/min)	Take (l/min/m)	Lugeon	Permeability (m/s)
30	511.64	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	3.40	0.28	0.54	8.14E-08
		Take (L/min)	3.45	3.40	3.50	3.45	3.45	3.35	3.35	3.40	3.40	3.35	3.35	3.35							
			450.00	453.40	456.90	460.35	463.80	467.15	470.50	473.90	477.30	480.65	484.00	487.35							
			446.55	450.00	453.40	456.90	460.35	463.80	467.15	470.50	473.90	477.30	480.65	484.00							
		Take (l/min)	3.45	3.40	3.50	3.45	3.45	3.35	3.35	3.40	3.40	3.35	3.35	3.35	0.00						
60	718.48	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	5.57	0.45	0.63	9.50E-08
		Take (L/min)	5.80	5.80	5.60	5.50	5.60	5.60	5.55	5.45	5.45	5.50	5.50	5.50							
			548.20	554.00	559.60	565.10	570.70	576.30	581.85	587.30	592.75	598.25	603.75	609.25							
			542.40	548.20	554.00	559.60	565.10	570.70	576.30	581.85	587.30	592.75	598.25	603.75							
		Take (l/min)	5.80	5.80	5.60	5.50	5.60	5.60	5.55	5.45	5.45	5.50	5.50	5.50	0.00						
90	925.32	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	7.62	0.62	0.67	1.01E-07
		Take (L/min)	7.70	7.70	7.60	7.60	7.70	7.50	7.55	7.60	7.65	7.60									
			725.70	733.40	741.00	748.60	756.30	763.80	771.35	778.95	786.60	794.20									
			718.00	725.70	733.40	741.00	748.60	756.30	763.80	771.35	778.95	786.60									
		Take (l/min)	7.70	7.70	7.60	7.60	7.70	7.50	7.55	7.60	7.65	7.60									
60	718.48	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	5.01	0.41	0.57	8.54E-08
		Take (L/min)	5.10	5.05	5.05	5.00	5.05	5.00	4.95	5.00	4.95	4.95									
			833.10	838.15	843.20	848.20	853.25	858.25	863.20	868.20	873.15	878.10									
			828.00	833.10	838.15	843.20	848.20	853.25	858.25	863.20	868.20	873.15									
		Take (l/min)	5.10	5.05	5.05	5.00	5.05	5.00	4.95	5.00	4.95	4.95									
30	511.64	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	2.72	0.22	0.43	6.52E-08
		Take (L/min)	2.80	2.75	2.75	2.66	2.72	2.69	2.71	2.70											
			913.80	916.55	919.30	921.96	924.68	927.37	930.08	932.78											
			911.00	913.80	916.55	919.30	921.96	924.68	927.37	930.08											
		Take (l/min)	2.80	2.75	2.75	2.66	2.72	2.69	2.71	2.70											

Test Pressure = Gauge pressure + static head - friction losses. **Note: friction losses ignored for this calculation.**

One Lugeon = 1 litre per minute per metre at a pressure of 10 bars.

K = Flow x ln(2 x Test Length/Hole diameter) / (2 x pi xTest length x Net head of water table at centre of test section) **Ref. Hoek and Bray.**





	1	2	3	4	5
Effective Pressure	511.64	718.48	925.32	718.48	511.64
Lugeon	0.54	0.63	0.67	0.57	0.43

Approximate Permeability (m/s)

Min k =	6.5E-08
Max k =	1.0E-07
Avg K =	8.6E-08
Best fit K =	9.0E-08

Flow Type Interpretation

Laminar	Yes
Turbulant	No
Washout	No
Swelling	No
Hydrofracturing	No

Comments

Ground water depth assumed to be 30 m.

PACKER TEST CALCULATION SHEET

Klohn Crippen Berger

PROJECT	AJAX GW Study	**PROJECT NO.**	M09871A01	**DATE**	29-Apr-14

Drill Hole ID KAX-14-124

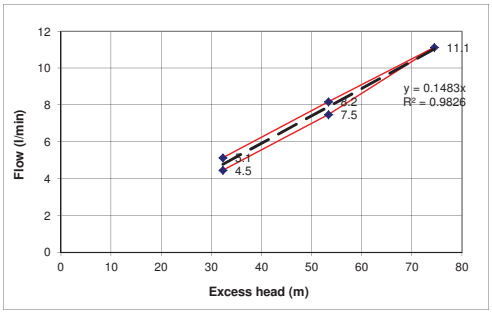
Hole Plunge	70 deg			True depth to ground water	10.1 m
Test Interval from	63.75 m to 83.5 m			Gauge height above ground	1.07 m
				Ground surface elevation	m
Test length	19.75 m			Static Head	109.58 kPa
Hole diameter	0.096 m			= (true gauge height (m) + groundwater depth (m)) x 9.81	

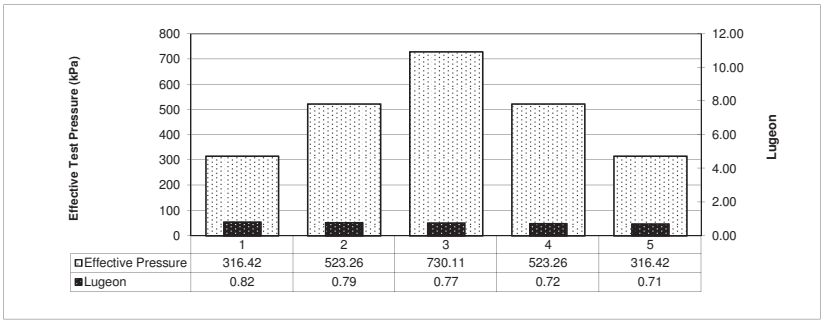
Gauge Pressure (psi)	Net Test Pressure (kPa)	Water Loss																Average flow (l/min)	Take (l/min/m)	Lugeon	Permeability (m/s)
		Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14				
		Take (L/min)	5.30	5.20	5.20	5.25	5.15	5.15	5.05	5.10	5.05	5.05	5.05								
30	316.42		638.20	643.40	648.60	653.85	659.00	664.15	669.20	674.30	679.35	684.40	689.45					5.14	0.26	0.82	1.34E-07
			632.90	638.20	643.40	648.60	653.85	659.00	664.15	669.20	674.30	679.35	684.40								
		Take (l/min)	5.30	5.20	5.20	5.25	5.15	5.15	5.05	5.10	5.05	5.05	5.05	0.00	0.00	0.00					
		Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14				
		Take (L/min)	8.45	8.25	8.30	8.20	8.10	8.20	8.00	8.10	8.10	8.10									
60	523.26		715.45	723.70	732.00	740.20	748.30	756.50	764.50	772.60	780.70	788.80						8.18	0.41	0.79	1.29E-07
			707.00	715.45	723.70	732.00	740.20	748.30	756.50	764.50	772.60	780.70									
		Take (l/min)	8.45	8.25	8.30	8.20	8.10	8.20	8.00	8.10	8.10	8.10									
		Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14				
		Take (L/min)	11.50	11.10	11.00	11.10	11.10	11.00	11.10												
90	730.11		815.50	826.60	837.60	848.70	859.80	870.80	881.90									11.13	0.56	0.77	1.26E-07
			804.00	815.50	826.60	837.60	848.70	859.80	870.80												
		Take (l/min)	11.50	11.10	11.00	11.10	11.10	11.00	11.10												
		Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14				
		Take (L/min)	7.70	7.65	7.70	7.60	7.45	7.40	7.35	7.35	7.35	7.35									
60	523.26		921.25	928.90	936.60	944.20	951.65	959.05	966.40	973.75	981.10	988.45						7.49	0.38	0.72	1.18E-07
			913.55	921.25	928.90	936.60	944.20	951.65	959.05	966.40	973.75	981.10									
		Take (l/min)	7.70	7.65	7.70	7.60	7.45	7.40	7.35	7.35	7.35	7.35	0.00	0.00							
		Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14				
		Take (L/min)	4.48	4.42	4.50	4.45	4.45	4.45	4.50	4.45	4.40	4.50	4.45	4.45							
30	316.42		1002.48	6.90	11.40	15.85	20.30	24.75	29.25	33.70	38.10	42.60	47.05	51.50				4.46	0.23	0.71	1.16E-07
			998.00	2.48	6.90	11.40	15.85	20.30	24.75	29.25	33.70	38.10	42.60	47.05							
		Take (l/min)	4.48	4.42	4.50	4.45	4.45	4.45	4.50	4.45	4.40	4.50	4.45	4.45							

Test Pressure = Gauge pressure + static head - friction losses. **Note: friction losses ignored for this calculation.**

One Lugeon = 1 litre per minute per metre at a pressure of 10 bars.

K = Flow x ln(2 x Test Length/Hole diameter) / (2 x pi xTest length x Net head of water table at centre of test section) **Ref. Hoek and Bray.**





Approximate Permeability (m/s)

Min k =	1.2E-07
Max k =	1.3E-07
Avg K =	1.2E-07
Best fit K =	1.2E-07

Flow Type Interpretation

Laminar	Yes
Turbulant	No
Washout	No
Swelling	No
Hydrofracturing	No

Comments

Ground water depth taken prior to packer test.

PACKER TEST CALCULATION SHEET

Klohn Crippen Berger

PROJECT	AJAX GW Study	**PROJECT NO.**	M09871A01	**DATE**	29-Apr-14

Drill Hole ID KAX-14-124

Hole Plunge	70	deg	True depth to ground water	24.9	m
Test Interval from	86.25	m to 103 m	Gauge height above ground	1.8	m
Test length	16.75	m	Ground surface elevation		m
Hole diameter	0.096	m	Static Head	261.93	kPa

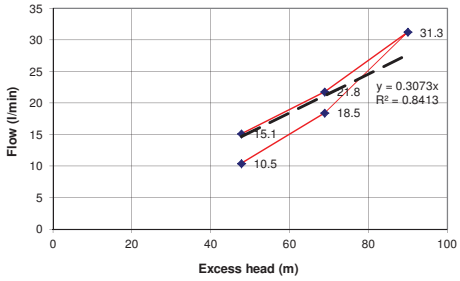
= (true gauge height (m) + groundwater depth (m)) x 9.81

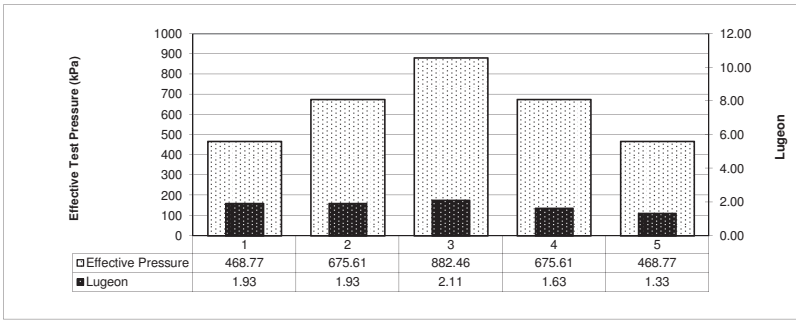
Gauge Pressure (psi)	Net Test Pressure (kPa)	Water Loss																Average flow (l/min)	Take (l/min/m)	Lugeon	Permeability (m/s)
		Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14				
		Take (L/min)	16.30	16.30	16.30	16.00	15.20	14.90	14.30	14.40	14.30	14.30	14.30								
30	468.77		265.00	281.30	297.60	313.60	328.80	343.70	358.00	372.40	386.70	401.00	415.30					15.15	0.90	1.93	3.06E-07
			248.70	265.00	281.30	297.60	313.60	328.80	343.70	358.00	372.40	386.70	401.00								
		Take (l/min)	16.30	16.30	16.30	16.00	15.20	14.90	14.30	14.40	14.30	14.30	14.30	0.00	0.00	0.00	0.00				
		Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14				
		Take (L/min)	22.00	22.50	22.00	22.00	22.00	21.40	21.40	21.50	21.50	21.60									
60	675.61		692.50	715.00	737.00	759.00	781.00	802.40	823.80	845.30	866.80	888.40						21.79	1.30	1.93	3.06E-07
			670.50	692.50	715.00	737.00	759.00	781.00	802.40	823.80	845.30	866.80									
		Take (l/min)	22.00	22.50	22.00	22.00	22.00	21.40	21.40	21.50	21.50	21.60	0.00	0.00							
		Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14				
		Take (L/min)	33.00	33.00	32.00	31.00	31.00	30.00	30.00	30.00											
90	882.46		260.00	293.00	325.00	356.00	387.00	417.00	447.00	477.00								31.25	1.87	2.11	3.35E-07
			227.00	260.00	293.00	325.00	356.00	387.00	417.00	447.00											
		Take (l/min)	33.00	33.00	32.00	31.00	31.00	30.00	30.00	30.00	0.00	0.00	0.00								
		Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14				
		Take (L/min)	19.20	19.20	19.00	18.20	18.50	18.30	18.10	18.00	18.00	18.00									
60	675.61		567.60	586.80	605.80	624.00	642.50	660.80	678.90	696.90	714.90	732.90						18.45	1.10	1.63	2.59E-07
			548.40	567.60	586.80	605.80	624.00	642.50	660.80	678.90	696.90	714.90									
		Take (l/min)	19.20	19.20	19.00	18.20	18.50	18.30	18.10	18.00	18.00	18.00	0.00	0.00							
		Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14				
		Take (L/min)	10.60	10.60	10.40	10.30	10.40	10.40													
30	468.77		752.60	763.20	773.60	783.90	794.30	804.70										10.45	0.62	1.33	2.11E-07
			742.00	752.60	763.20	773.60	783.90	794.30													
		Take (l/min)	10.60	10.60	10.40	10.30	10.40	10.40													

Test Pressure = Gauge pressure + static head - friction losses. **Note: friction losses ignored for this calculation.**

One Lugeon = 1 litre per minute per metre at a pressure of 10 bars.

K = Flow x ln(2 x Test Length/Hole diameter) / (2 x pi xTest length x Net head of water table at centre of test section) **Ref. Hoek and Bray.**





Approximate Permeability (m/s)

Min k =	2.1E-07
Max k =	3.4E-07
Avg K =	2.8E-07
Best fit K =	3.0E-07

Flow Type Interpretation

Laminar	Yes
Turbulant	No
Washout	No
Swelling	No
Hydrofracturing	No

Comments

Ground water depth taken prior to packer test.

PACKER TEST CALCULATION SHEET

Klohn Crippen Berger

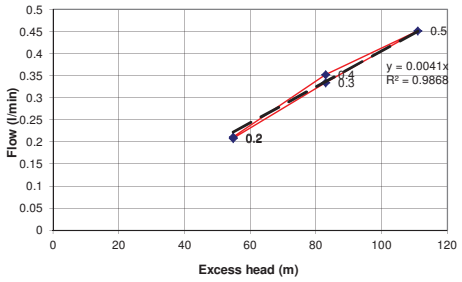
PROJECT	AJAX GW Study	**PROJECT NO.**	M09871A01	**DATE**	29-Apr-14
Drill Hole ID	KAX-14-124	True depth to ground water	24.9 m		
Hole Plunge	70 deg	Gauge height above ground	1.8 m		
Test Interval from	116.25 136 m	Ground surface elevation	m		
Test length	19.75 m	Static Head	261.93 kPa		
Hole diameter	0.096 m	= (true gauge height (m) + groundwater depth (m)) x 9.81			

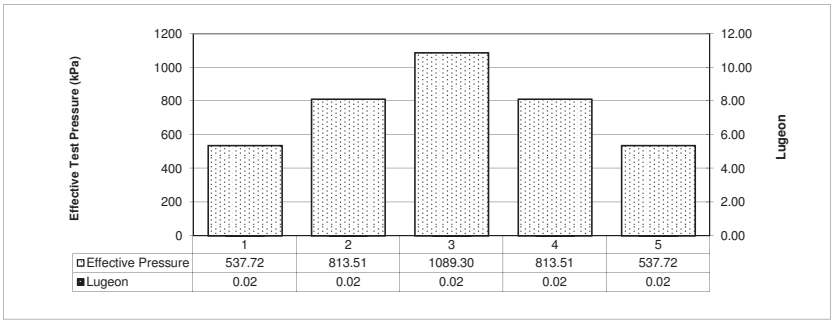
Gauge Pressure (psi)	Net Test Pressure (kPa)	Water Loss																Average flow (l/min)	Take (l/min/m)	Lugeon	Permeability (m/s)
40	537.72	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.21	0.01	0.02	3.25E-09
		Take (L/min)	0.22	0.21	0.22	0.21	0.20	0.22	0.20	0.20	0.20	0.22	0.23	0.21	0.21	0.21					
			813.22	813.43	813.65	813.86	814.06	814.28	814.48	814.68	814.88	815.10	815.33	815.54	815.75	815.96					
			813.00	813.22	813.43	813.65	813.86	814.06	814.28	814.48	814.68	814.88	815.10	815.33	815.54	815.75					
		Take (l/min)	0.22	0.21	0.22	0.21	0.20	0.22	0.20	0.20	0.20	0.22	0.23	0.21	0.21	0.21					
80	813.51	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.35	0.02	0.02	3.58E-09
		Take (L/min)	0.35	0.37	0.35	0.35	0.36	0.34	0.35	0.35	0.35	0.35									
			817.35	817.72	818.07	818.42	818.78	819.12	819.47	819.82	820.17	820.52									
			817.00	817.35	817.72	818.07	818.42	818.78	819.12	819.47	819.82	820.17									
		Take (l/min)	0.35	0.37	0.35	0.35	0.36	0.34	0.35	0.35	0.35	0.35									
120	1089.30	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.45	0.02	0.02	3.43E-09
		Take (L/min)	0.45	0.47	0.44	0.46	0.47	0.46	0.45	0.46	0.44	0.44	0.44	0.44							
			823.05	823.52	823.96	824.42	824.89	825.35	825.80	826.26	826.70	827.14	827.58	828.02							
			822.60	823.05	823.52	823.96	824.42	824.89	825.35	825.80	826.26	826.70	827.14	827.58							
		Take (l/min)	0.45	0.47	0.44	0.46	0.47	0.46	0.45	0.46	0.44	0.44	0.44	0.44							
80	813.51	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.33	0.02	0.02	3.40E-09
		Take (L/min)	0.34	0.34	0.34	0.33	0.33	0.33	0.33												
			829.04	829.38	829.72	830.05	830.38	830.71	831.04												
			828.70	829.04	829.38	829.72	830.05	830.38	830.71												
		Take (l/min)	0.34	0.34	0.34	0.33	0.33	0.33	0.33												
40	537.72	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.21	0.01	0.02	3.21E-09
		Take (L/min)	0.22	0.20	0.21	0.21	0.20	0.21	0.21												
			831.72	831.92	832.13	832.34	832.54	832.75	832.96												
			831.50	831.72	831.92	832.13	832.34	832.54	832.75												
		Take (l/min)	0.22	0.20	0.21	0.21	0.20	0.21	0.21												

Test Pressure = Gauge pressure + static head - friction losses. **Note: friction losses ignored for this calculation.**

One Lugeon = 1 litre per minute per metre at a pressure of 10 bars.

K = Flow x ln(2 x Test Length/Hole diameter) / (2 x pi xTest length x Net head of water table at centre of test section) **Ref. Hoek and Bray.**





Approximate Permeability (m/s)

Min k =	3.2E-09
Max k =	3.6E-09
Avg K =	3.4E-09
Best fit K =	3.5E-09

Flow Type Interpretation

Laminar	Yes
Turbulant	No
Washout	No
Swelling	No
Hydrofracturing	No

Comments

Ground water depth assumed at 24.9 m.

PACKER TEST CALCULATION SHEET

Klohn Crippen Berger

PROJECT	AJAX GW Study	**PROJECT NO.**	M09871A01
DATE	29-Apr-14		

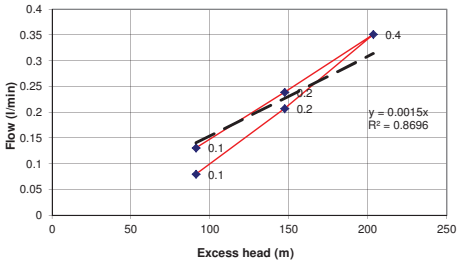
Drill Hole ID	KAX-14-124	True depth to ground water	24.9 m
Hole Plunge	70 deg	Gauge height above ground	10 m
Test Interval from	137.25 m to 166 m	Ground surface elevation	m
Test length	28.75 m	Static Head	342.37 kPa
Hole diameter	0.096 m	= (true gauge height (m) + groundwater depth (m)) x 9.81	

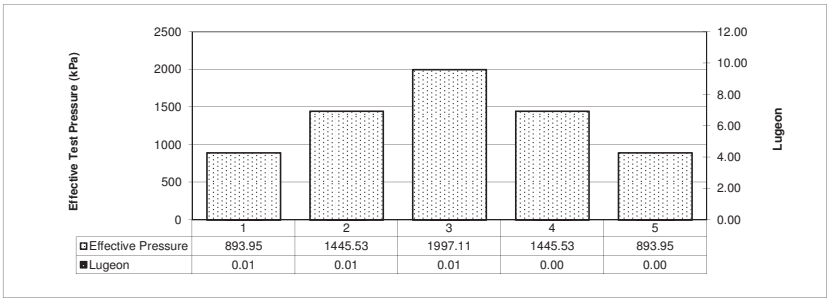
Gauge Pressure (psi)	Net Test Pressure (kPa)	Water Loss																Average flow (l/min)	Take (l/min/m)	Lugeon	Permeability (m/s)
80	893.95	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.13	0.00	0.01	8.85E-10
		Take (L/min)	0.15	0.13	0.13	0.14	0.14	0.13	0.12	0.15	0.10	0.12									
			944.40	944.53	944.66	944.80	944.94	945.07	945.19	945.34	945.44	945.56									
			944.25	944.40	944.53	944.66	944.80	944.94	945.07	945.19	945.34	945.44									
		Take (l/min)	0.15	0.13	0.13	0.14	0.14	0.13	0.12	0.15	0.10	0.12	0.00	0.00	0.00						
160	1445.53	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.24	0.01	0.01	9.98E-10
		Take (L/min)	0.26	0.24	0.27	0.19	0.24	0.22	0.24	0.25	0.24										
			948.25	948.49	948.76	948.95	949.19	949.41	949.65	949.90	950.14										
			947.99	948.25	948.49	948.76	948.95	949.19	949.41	949.65	949.90										
		Take (l/min)	0.26	0.24	0.27	0.19	0.24	0.22	0.24	0.25	0.24	0.00	0.00	0.00							
240	1997.11	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.35	0.01	0.01	1.06E-09
		Take (L/min)	0.35	0.35	0.37	0.38	0.37	0.34	0.35	0.33	0.32	0.35									
			952.98	953.33	953.70	954.08	954.45	954.79	955.14	955.47	955.79	956.14									
			952.63	952.98	953.33	953.70	954.08	954.45	954.79	955.14	955.47	955.79									
		Take (l/min)	0.35	0.35	0.37	0.38	0.37	0.34	0.35	0.33	0.32	0.35	0.00	0.00							
160	1445.53	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.21	0.01	0.00	8.65E-10
		Take (L/min)	0.19	0.21	0.21	0.19	0.23	0.22	0.21	0.22	0.19	0.20									
			956.40	956.61	956.82	957.01	957.24	957.46	957.67	957.89	958.08	958.28									
			956.21	956.40	956.61	956.82	957.01	957.24	957.46	957.67	957.89	958.08									
		Take (l/min)	0.19	0.21	0.21	0.19	0.23	0.22	0.21	0.22	0.19	0.20									
80	893.95	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.08	0.00	0.00	5.41E-10
		Take (L/min)	0.06	0.07	0.07	0.05	0.09	0.09	0.10	0.06	0.10	0.09	0.10								
			958.02	958.09	958.16	958.21	958.30	958.39	958.49	958.55	958.65	958.74	958.84								
			957.96	958.02	958.09	958.16	958.21	958.30	958.39	958.49	958.55	958.65	958.74								
		Take (l/min)	0.06	0.07	0.07	0.05	0.09	0.09	0.10	0.06	0.10	0.09	0.10	0.00	0.00	0.00					

Test Pressure = Gauge pressure + static head - friction losses. **Note: friction losses ignored for this calculation.**

One Lugeon = 1 litre per minute per metre at a pressure of 10 bars.

K = Flow x ln(2 x Test Length/Hole diameter) / (2 x pi xTest length x Net head of water table at centre of test section) **Ref. Hoek and Bray.**





Approximate Permeability (m/s)

Min k =	5.4E-10
Max k =	1.1E-09
Avg K =	8.7E-10
Best fit K =	9.2E-10

Flow Type Interpretation

Laminar	Yes
Turbulant	No
Washout	No
Swelling	No
Hydrofracturing	No

Comments

Ground water depth assumed to be 24.9 m.

PACKER TEST CALCULATION SHEET

Klohn Crippen Berger

PROJECT	AJAX GW Study	**PROJECT NO.**	M09871A01	**DATE**	29-Apr-14

Drill Hole ID KAX-14-128

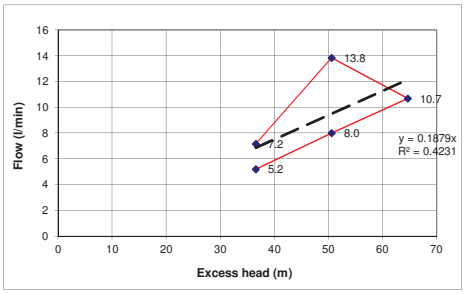
Hole Plunge	90 deg	True depth to ground water	21.5 m
Test Interval from	65.05 m to 81.8 m	Gauge height above ground	1 m
Test length	16.75 m	Ground surface elevation	m
Hole diameter	0.096 m	Static Head	220.73 kPa
		= (true gauge height (m) + groundwater depth (m)) x 9.81	

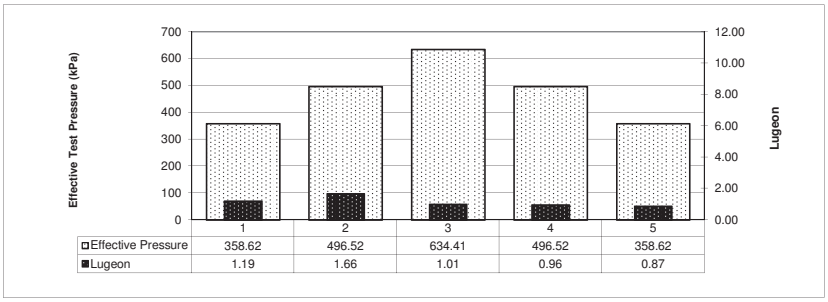
Gauge Pressure (psi)	Net Test Pressure (kPa)	Water Loss																Average flow (l/min)	Take (l/min/m)	Lugeon	Permeability (m/s)
20	358.62	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	7.17	0.43	1.19	1.82E-07
		Take (L/min)	7.400	7.300	7.200	7.100	7.100	7.200	7.100	7.100	7.100	7.100									
			272.100	279.400	286.600	293.700	300.800	308.000	315.100	322.200	329.300	336.400									
			264.700	272.100	279.400	286.600	293.700	300.800	308.000	315.100	322.200	329.300									
		Take (l/min)	7.400	7.300	7.200	7.100	7.100	7.200	7.100	7.100	7.100	7.100	0.000	0.000							
40	496.52	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	13.85	0.83	1.66	2.54E-07
		Take (L/min)	14.500	14.200	14.100	13.500	13.800	13.700	13.700	13.700	13.700	13.600	13.800								
			401.400	415.600	429.700	443.200	457.000	470.700	484.400	498.100	511.800	525.400	539.200								
			386.900	401.400	415.600	429.700	443.200	457.000	470.700	484.400	498.100	511.800	525.400								
		Take (l/min)	14.500	14.200	14.100	13.500	13.800	13.700	13.700	13.700	13.700	13.600	13.800	0.000	0.000						
60	634.41	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	10.70	0.64	1.01	1.53E-07
		Take (L/min)	10.700	10.900	10.600	10.700	10.600	10.800	10.700	10.600	10.700	10.800	10.600								
			790.200	801.100	811.7	822.4	833	843.8	854.5	865.1	875.8	886.6	897.2								
			779.500	790.200	801.100	811.700	822.400	833.000	843.800	854.500	865.100	875.800	886.600								
		Take (l/min)	10.700	10.900	10.600	10.700	10.600	10.800	10.700	10.600	10.700	10.800	10.600	0.000	0.000	0.000	0.000				
40	496.52	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	8.01	0.48	0.96	1.47E-07
		Take (L/min)	8.000	8.100	8.500	7.600	8.100	8.000	8.000	8.000	8.000	8.000	7.900	7.900	8.000						
			924.200	932.300	940.800	948.400	956.500	964.500	972.500	980.500	988.500	996.500	1004.400	1012.300	1020.300						
			916.200	924.200	932.300	940.800	948.400	956.500	964.500	972.500	980.500	988.500	996.500	1004.400	1012.300						
		Take (l/min)	8.000	8.100	8.500	7.600	8.100	8.000	8.000	8.000	8.000	8.000	7.900	7.900	8.000						
20	358.62	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	5.21	0.31	0.87	1.32E-07
		Take (L/min)	5.100	5.100	5.100	5.100	5.100	5.100	5.200	5.200	5.300	5.300	5.300	5.400	5.200	5.300	5.300				
			58.400	63.500	68.600	73.700	78.800	83.900	89.100	94.300	99.600	104.900	110.200	115.600	120.800	126.100	131.400				
			53.300	58.400	63.500	68.600	73.700	78.800	83.900	89.100	94.300	99.600	104.900	110.200	115.600	120.800	126.100				
		Take (l/min)	5.100	5.100	5.100	5.100	5.100	5.100	5.200	5.200	5.300	5.300	5.300	5.400	5.200	5.300	5.300				

Test Pressure = Gauge pressure + static head - friction losses. **Note: friction losses ignored for this calculation.**

One Lugeon = 1 litre per minute per metre at a pressure of 10 bars.

K = Flow x ln(2 x Test Length/Hole diameter) / (2 x pi xTest length x Net head of water table at centre of test section) **Ref. Hoek and Bray.**





Approximate Permeability (m/s)

Min k =	1.3E-07
Max k =	2.5E-07
Avg K =	1.7E-07
Best fit K =	1.7E-07

Flow Type Interpretation

Laminar	Yes
Turbulant	No
Washout	No
Swelling	No
Hydrofracturing	No

Comments

Ground water depth taken prior to packer test.

PACKER TEST CALCULATION SHEET

Klohn Crippen Berger

PROJECT	AJAX GW Study	**PROJECT NO.**	M09871A01
DATE	29-Apr-14		

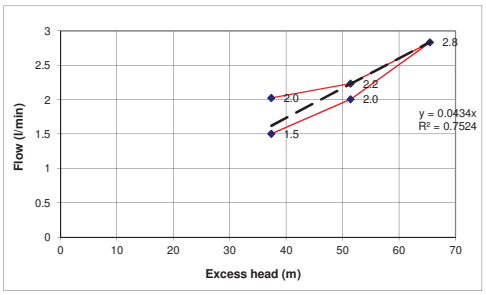
Drill Hole ID	KAX-14-128	True depth to ground water	22.3 m
Hole Plunge	90 deg	Gauge height above ground	1 m
Test Interval from	95.05 m to 110.3 m	Ground surface elevation	m
Test length	15.25 m	Static Head	228.57 kPa
Hole diameter	0.096 m	= (true gauge height (m) + groundwater depth (m)) x 9.81	

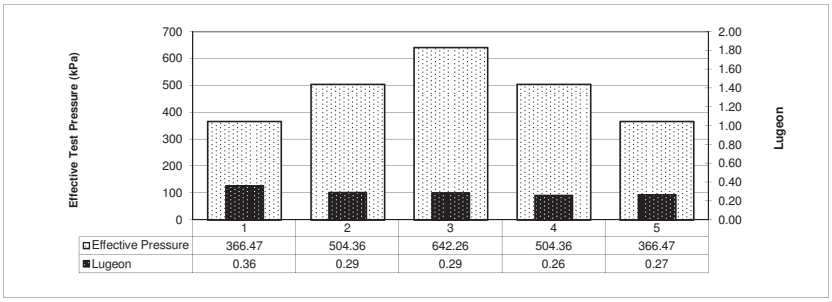
Gauge Pressure (psi)	Net Test Pressure (kPa)	Water Loss																Average flow (l/min)	Take (l/min/m)	Lugeon	Permeability (m/s)
		Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14				
		Take (L/min)	2.150	2.150	2.100	2.050	2.050	2.000	2.000	1.950	1.950	1.900									
20	366.47		355.350	357.500	359.600	361.650	363.700	365.700	367.700	369.650	371.600	373.500						2.03	0.13	0.36	5.45E-08
			353.200	355.350	357.500	359.600	361.650	363.700	365.700	367.700	369.650	371.600									
		Take (l/min)	2.150	2.150	2.100	2.050	2.050	2.000	2.000	1.950	1.950	1.900	0.000	0.000	0.000	0.000	0.000				
		Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14				
		Take (L/min)	2.350	2.250	2.300	2.250	2.200	2.250	2.200	2.200	2.200	2.200									
40	504.36		408.350	410.600	412.900	415.150	417.350	419.600	421.800	424.000	426.200	428.400						2.24	0.15	0.29	4.37E-08
			406.000	408.350	410.600	412.900	415.150	417.350	419.600	421.800	424.000	426.200									
		Take (l/min)	2.350	2.250	2.300	2.250	2.200	2.250	2.200	2.200	2.200	2.200									
		Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14				
		Take (L/min)	2.950	2.950	3.000	3.000	2.900	2.800	2.700	2.700	2.700	2.700									
60	642.26		469.35	472.3	475.3	478.3	481.2	484	486.7	489.4	492.1	494.8						2.84	0.19	0.29	4.35E-08
			466.400	469.350	472.300	475.300	478.300	481.200	484.000	486.700	489.400	492.100									
		Take (l/min)	2.950	2.950	3.000	3.000	2.900	2.800	2.700	2.700	2.700	2.700	0.000	0.000	0.000	0.000	0.000				
		Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14				
		Take (L/min)	2.050	2.000	2.000	2.000	2.000	2.000													
40	504.36		512.050	514.050	516.050	518.050	520.050	522.050										2.01	0.13	0.26	3.91E-08
			510.000	512.050	514.050	516.050	518.050	520.050													
		Take (l/min)	2.050	2.000	2.000	2.000	2.000	2.000													
		Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14				
		Take (L/min)	1.550	1.500	1.500	1.500	1.500	1.500													
20	366.47		526.050	527.550	529.050	530.550	532.050	533.550										1.51	0.10	0.27	4.05E-08
			524.500	526.050	527.550	529.050	530.550	532.050													
		Take (l/min)	1.550	1.500	1.500	1.500	1.500	1.500													

Test Pressure = Gauge pressure + static head - friction losses. **Note: friction losses ignored for this calculation.**

One Lugeon = 1 litre per minute per metre at a pressure of 10 bars.

K = Flow x ln(2 x Test Length/Hole diameter) / (2 x pi xTest length x Net head of water table at centre of test section) **Ref. Hoek and Bray.**





Approximate Permeability (m/s)

Min k =	3.9E-08
Max k =	5.4E-08
Avg K =	4.4E-08
Best fit K =	4.3E-08

Flow Type Interpretation

Laminar	Yes
Turbulant	No
Washout	No
Swelling	No
Hydrofracturing	No

Comments

Ground water depth taken prior to packer test.

PACKER TEST CALCULATION SHEET

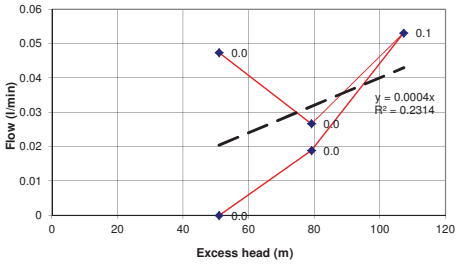
Klohn Crippen Berger

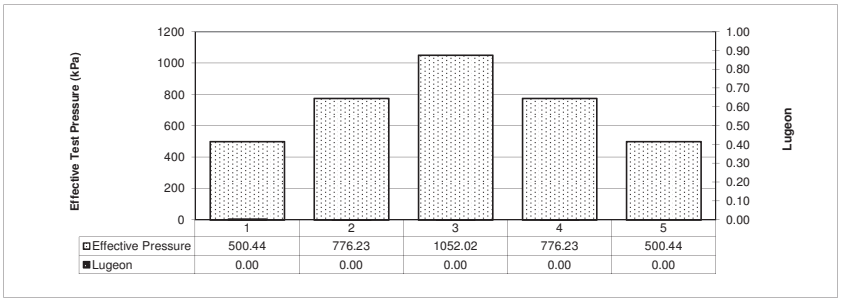
PROJECT	AJAX GW Study	**PROJECT NO.**	M09871A01	**DATE**	29-Apr-14

Drill Hole ID	KAX-14-128	True depth to ground water	22.3 m
Hole Plunge	90 deg	Gauge height above ground	0.6 m
Test Interval from	111.05 m to 131.03 m	Ground surface elevation	m
Test length	19.98 m	Static Head	224.65 kPa
Hole diameter	0.096 m	= (true gauge height (m) + groundwater depth (m)) x 9.81	

Gauge Pressure (psi)	Net Test Pressure (kPa)	Water Loss																Average flow (l/min)	Take (l/min/m)	Lugeon	Permeability (m/s)
40	500.44	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.05	0.00	0.00	7.43E-10
		Take (L/min)	0.060	0.050	0.050	0.060	0.030	0.060	0.050	0.060	0.050	0.030	0.040	0.030	0.040	0.050	0.050				
			561.000	561.050	561.100	561.160	561.190	561.250	561.300	561.360	561.410	561.440	561.480	561.510	561.550	561.600	561.650				
			560.940	561.000	561.050	561.100	561.160	561.190	561.250	561.300	561.360	561.410	561.440	561.480	561.510	561.550	561.600				
		Take (l/min)	0.060	0.050	0.050	0.060	0.030	0.060	0.050	0.060	0.050	0.030	0.040	0.030	0.040	0.050	0.050				
80	776.23	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.03	0.00	0.00	2.70E-10
		Take (L/min)	0.040	0.030	0.020	0.040	0.020	0.020	0.030	0.010	0.040	0.020	0.010	0.040							
			568.460	568.490	568.510	568.550	568.570	568.590	568.620	568.630	568.670	568.690	568.700	568.740							
			568.420	568.460	568.490	568.510	568.550	568.570	568.590	568.620	568.630	568.670	568.690	568.700							
		Take (l/min)	0.040	0.030	0.020	0.040	0.020	0.020	0.030	0.010	0.040	0.020	0.010	0.040	0.000	0.000	0.000				
120	1052.02	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.05	0.00	0.00	3.96E-10
		Take (L/min)	0.050	0.070	0.060	0.070	0.050	0.040	0.060	0.040	0.030	0.060	0.040	0.070	0.050						
			569.050	569.120	569.180	569.250	569.300	569.340	569.4	569.44	569.47	569.53	569.57	569.64	569.69						
			569.000	569.050	569.120	569.180	569.250	569.300	569.340	569.400	569.440	569.470	569.530	569.570	569.640						
		Take (l/min)	0.050	0.070	0.060	0.070	0.050	0.040	0.060	0.040	0.030	0.060	0.040	0.070	0.050						
80	776.23	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.02	0.00	0.00	1.91E-10
		Take (L/min)	0.010	0.000	0.030	0.010	0.010	0.030	0.020	0.010	0.030	0.020									
			569.660	569.660	569.690	569.700	569.710	569.740	569.76	569.77	569.8	569.82									
			569.650	569.660	569.660	569.690	569.700	569.710	569.740	569.760	569.770	569.800									
		Take (l/min)	0.010	0.000	0.030	0.010	0.010	0.030	0.020	0.010	0.030	0.020									
40	500.44	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.00	0.00	0.00	0.00E+00
		Take (L/min)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000											
			569.750	569.750	569.750	569.750	569.750	569.750	569.750	569.750	569.750	569.750									
			569.750	569.750	569.750	569.750	569.750	569.750	569.750	569.750	569.750	569.750									
		Take (l/min)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000									

Test Pressure = Gauge pressure + static head - friction losses. **Note: friction losses ignored for this calculation.**
One Lugeon = 1 litre per minute per metre at a pressure of 10 bars.
K = Flow x ln(2 x Test Length/Hole diameter) / (2 x pi xTest length x Net head of water table at centre of test section) **Ref. Hoek and Bray.**





Approximate Permeability (m/s)

Min k =	1.9E-10
Max k =	7.4E-10
Avg K =	4.0E-10
Best fit K =	3.2E-10

Flow Type Interpretation

Laminar	Yes
Turbulant	No
Washout	No
Swelling	No
Hydrofracturing	No

Comments

Ground water depth assumed to be 22.3 m.
Average K excludes P5 pressure stage (no flow observed)

PACKER TEST CALCULATION SHEET

Klohn Crippen Berger

PROJECT	AJAX GW Study	**PROJECT NO.**	M09871A01
DATE	29-Apr-14		

Drill Hole ID KAX-14-128

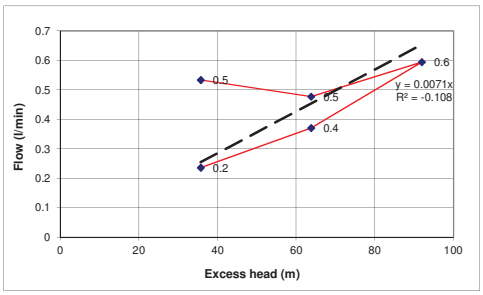
Hole Plunge	90 deg	True depth to ground water	7 m
Test Interval from	156.05 m to 174.8 m	Gauge height above ground	0.6 m
Test length	18.75 m	Ground surface elevation	m
Hole diameter	0.096 m	Static Head	74.56 kPa
		= (true gauge height (m) + groundwater depth (m)) x 9.81	

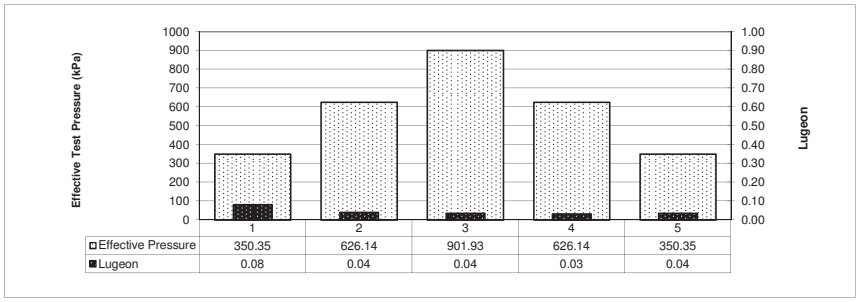
Gauge Pressure (psi)	Net Test Pressure (kPa)	Water Loss																Average flow (l/min)	Take (l/min/m)	Lugeon	Permeability (m/s)
40	350.35	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.53	0.03	0.08	1.26E-08
		Take (L/min)	0.590	0.550	0.510	0.510	0.480	0.530	0.530	0.570	0.570	0.530	0.500								
			521.300	521.850	522.360	522.870	523.350	523.880	524.410	524.980	525.550	526.080	526.580								
			520.710	521.300	521.850	522.360	522.870	523.350	523.880	524.410	524.980	525.550	526.080								
		Take (l/min)	0.590	0.550	0.510	0.510	0.480	0.530	0.530	0.570	0.570	0.530	0.500	0.000	0.000	0.000	0.000				
80	626.14	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.48	0.03	0.04	6.32E-09
		Take (L/min)	0.490	0.470	0.480	0.470	0.480	0.500	0.500	0.460	0.460	0.470									
			541.150	541.620	542.100	542.570	543.050	543.550	544.050	544.510	544.970	545.440									
			540.660	541.150	541.620	542.100	542.570	543.050	543.550	544.050	544.510	544.970									
		Take (l/min)	0.490	0.470	0.480	0.470	0.480	0.500	0.500	0.460	0.460	0.470	0.000	0.000	0.000	0.000	0.000				
120	901.93	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.60	0.03	0.04	5.47E-09
		Take (L/min)	0.640	0.620	0.600	0.600	0.600	0.600	0.620	0.580	0.590	0.570	0.570	0.580	0.570						
			558.220	558.840	559.440	561.300	561.9	562.5	563.12	563.7	564.29	564.86	565.43	566.01	566.58						
			557.580	558.220	558.840	560.700	561.300	561.900	562.500	563.120	563.700	564.290	564.860	565.430	566.010						
		Take (l/min)	0.640	0.620	0.600	0.600	0.600	0.600	0.620	0.580	0.590	0.570	0.570	0.580	0.570	0.000	0.000				
80	626.14	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.37	0.02	0.03	4.91E-09
		Take (L/min)	0.390	0.360	0.400	0.370	0.380	0.360	0.360	0.390	0.350	0.360	0.360								
			569.640	570.000	570.400	570.770	571.150	571.510	571.87	572.26	572.61	572.97	573.33								
			569.250	569.640	570.000	570.400	570.770	571.150	571.510	571.870	572.260	572.610	572.970								
		Take (l/min)	0.390	0.360	0.400	0.370	0.380	0.360	0.360	0.390	0.350	0.360	0.360								
40	350.35	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.24	0.01	0.04	5.58E-09
		Take (L/min)	0.250	0.250	0.250	0.250	0.250	0.210	0.250	0.210	0.240	0.230	0.230	0.230	0.240	0.220	0.230				
			575.500	575.750	576.000	576.250	576.500	576.710	576.96	577.17	577.41	577.64	577.87	578.100	578.340	578.560	578.790				
			575.250	575.500	575.750	576.000	576.250	576.500	576.710	576.960	577.170	577.410	577.640	577.870	578.100	578.340	578.560				
		Take (l/min)	0.250	0.250	0.250	0.250	0.250	0.210	0.250	0.210	0.240	0.230	0.230	0.230	0.240	0.220	0.230				

Test Pressure = Gauge pressure + static head - friction losses. **Note: friction losses ignored for this calculation.**

One Lugeon = 1 litre per minute per metre at a pressure of 10 bars.

K = Flow x ln(2 x Test Length/Hole diameter) / (2 x pi xTest length x Net head of water table at centre of test section) **Ref. Hoek and Bray.**





Approximate Permeability (m/s)

Min k =	4.9E-09
Max k =	1.3E-08
Avg K =	7.0E-09
Best fit K =	8.7E-09

Flow Type Interpretation

Laminar	Yes
Turbulant	No
Washout	No
Swelling	No
Hydrofracturing	No

Comments

Ground water depth taken prior to packer test.
Gauge height assumed to be 0.6 m.

PACKER TEST CALCULATION SHEET

Klohn Crippen Berger

PROJECT	AJAX GW Study	**PROJECT NO.**	M09871A01	**DATE**	30-Apr-14

Drill Hole ID KAX-14-130

Hole Plunge	70	deg	True depth to ground water	11.9	m
Test Interval from	36.75	44.5 m	Gauge height above ground	1.8	m
Test length	7.75	m	Ground surface elevation		m
Hole diameter	0.096	m	Static Head	134.40	kPa

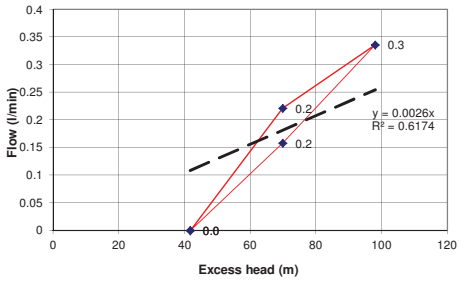
= (true gauge height (m) + groundwater depth (m)) x 9.81

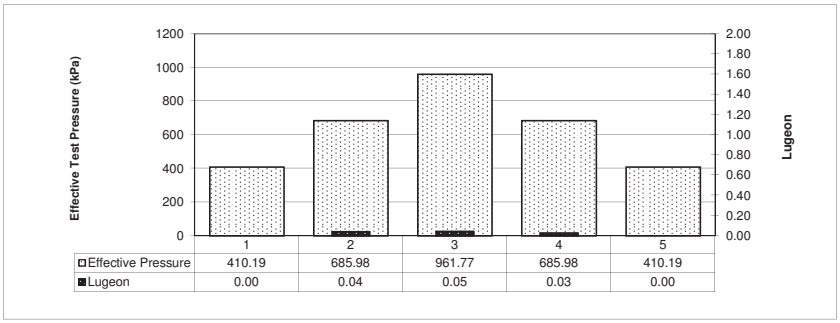
Gauge Pressure (psi)	Net Test Pressure (kPa)	Water Loss																Average flow (l/min)	Take (l/min/m)	Lugeon	Permeability (m/s)
40	410.19	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.00	0.00	0.00	0.00E+00
		Take (L/min)	0.000	0.000	0.000	0.000	0.000														
			753.60	753.60	753.60	753.60	753.60														
			753.60	753.60	753.60	753.60	753.60														
		Take (l/min)	0.000	0.000	0.000	0.000	0.000														
80	685.98	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.22	0.03	0.04	5.71E-09
		Take (L/min)	0.240	0.240	0.210	0.240	0.220	0.210	0.230	0.200	0.230	0.200	0.200	0.230							
			756.00	756.24	756.45	756.69	756.91	757.12	757.35	757.55	757.78	757.98	758.18	758.41							
			755.76	756.00	756.24	756.45	756.69	756.91	757.12	757.35	757.55	757.78	757.98	758.18							
		Take (l/min)	0.240	0.240	0.210	0.240	0.220	0.210	0.230	0.200	0.230	0.200	0.200	0.230	0.000	0.000	0.000				
120	961.77	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.34	0.04	0.05	6.19E-09
		Take (L/min)	0.360	0.330	0.370	0.330	0.350	0.310	0.340	0.320	0.340	0.310									
			762.08	762.41	762.78	763.11	763.46	763.77	764.11	764.43	764.77	765.08									
			761.72	762.08	762.41	762.78	763.11	763.46	763.77	764.11	764.43	764.77									
		Take (l/min)	0.360	0.330	0.370	0.330	0.350	0.310	0.340	0.320	0.340	0.310									
80	685.98	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.16	0.02	0.03	4.08E-09
		Take (L/min)	0.130	0.150	0.190	0.130	0.180	0.160	0.150	0.170	0.150	0.170									
		Take (l/min)	0.130	0.150	0.190	0.130	0.180	0.160	0.150	0.170	0.150	0.170	0.000	0.000	0.000	0.000	0.000				
40	410.19	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.00	0.00	0.00	0.00E+00
		Take (L/min)	0.000	0.000	0.000	0.000	0.000														
		Take (l/min)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000				

Test Pressure = Gauge pressure + static head - friction losses. **Note: friction losses ignored for this calculation.**

One Lugeon = 1 litre per minute per metre at a pressure of 10 bars.

K = Flow x ln(2 x Test Length/Hole diameter) / (2 x pi xTest length x Net head of water table at centre of test section) **Ref. Hoek and Bray.**





Approximate Permeability (m/s)

Min k =	4.1E-09
Max k =	6.2E-09
Avg K =	5.3E-09
Best fit K =	4.7E-09

Flow Type Interpretation

Laminar	Yes
Turbulant	No
Washout	No
Swelling	No
Hydrofracturing	No

Comments

Ground water depth taken prior to packer test.
No flow observed at P1 and P5 (40 psi) pressure stages; average K excludes these stages.

PACKER TEST CALCULATION SHEET

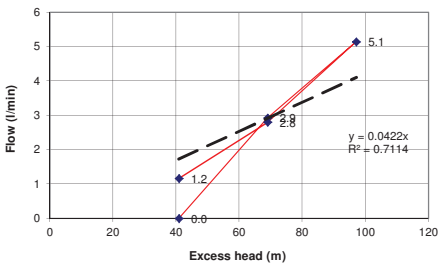
Klohn Crippen Berger

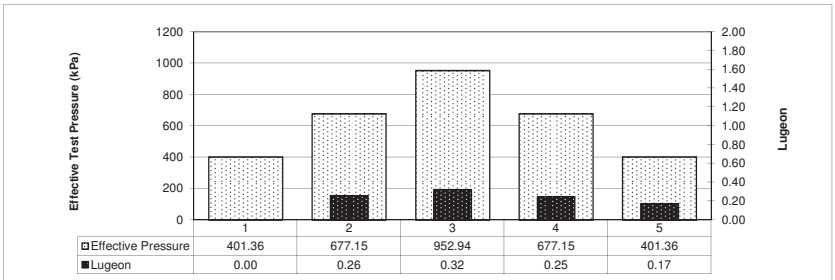
PROJECT	AJAX GW Study	**PROJECT NO.**	M09871A01	**DATE**	30-Apr-14

Drill Hole ID	KAX-14-130	True depth to ground water	11 m
Hole Plunge	70 deg	Gauge height above ground	1.8 m
Test Interval from	65.05 m to 81.8 m	Ground surface elevation	m
Test length	16.75 m	Static Head	125.57 kPa
Hole diameter	0.096 m	= (true gauge height (m) + groundwater depth (m)) x 9.81	

Gauge Pressure (psi)	Net Test Pressure (kPa)	Water Loss																Average flow (l/min)	Take (l/min/m)	Lugeon	Permeability (m/s)
40	401.36	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.00	0.00	0.00	0.00E+00
		Take (L/min)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000									
		Take (l/min)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000				
80	677.15	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	2.92	0.17	0.26	4.09E-08
		Take (L/min)	3.000	2.950	2.920	2.880	2.950	2.950	2.900	2.900	2.900	2.900	2.900								
		Take (l/min)	3.000	2.950	2.920	2.880	2.950	2.950	2.900	2.900	2.900	2.900	2.900	0.000	0.000	0.000	0.000				
120	952.94	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	5.13	0.31	0.32	5.10E-08
		Take (L/min)	5.050	5.050	5.150	5.200	5.100	5.300	5.200	5.000	5.150	5.250	5.400	5.000	4.900						
		Take (l/min)	5.050	5.050	5.150	5.200	5.100	5.300	5.200	5.000	5.150	5.250	5.400	5.000	4.900	0.000	0.000				
80	677.15	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	2.80	0.17	0.25	3.91E-08
		Take (L/min)	2.700	2.950	2.800	2.800	2.800	2.800	2.800	2.750	2.800	2.750	2.800	2.800							
		Take (l/min)	2.700	2.950	2.800	2.800	2.800	2.800	2.800	2.750	2.800	2.750	2.800	2.800	0.000	0.000	0.000				
40	401.36	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	1.16	0.07	0.17	2.74E-08
		Take (L/min)	1.180	1.120	1.160	1.100	1.220	1.160	1.160	1.150	1.160	1.170	1.180	1.150							
		Take (l/min)	1.180	1.120	1.160	1.100	1.220	1.160	1.160	1.150	1.160	1.170	1.180	1.150	0.000	0.000	0.000				

Test Pressure = Gauge pressure + static head - friction losses. Note: friction losses ignored for this calculation.
One Lugeon = 1 litre per minute per metre at a pressure of 10 bars.
K = Flow x ln(2 x Test Length/Hole diameter) / (2 x pi xTest length x Net head of water table at centre of test section) Ref. Hoek and Bray.





Approximate Permeability (m/s)

Min k =	2.7E-08
Max k =	5.1E-08
Avg K =	4.0E-08
Best fit K =	4.1E-08

Flow Type Interpretation

Laminar	Yes
Turbulant	No
Washout	No
Swelling	No
Hydrofracturing	No

Comments

Ground water depth taken prior to packer test.
No flow observed at the first pressure step.

PACKER TEST CALCULATION SHEET

Klohn Crippen Berger

PROJECT	AJAX GW Study	**PROJECT NO.**	M09871A01	**DATE**	30-Apr-14

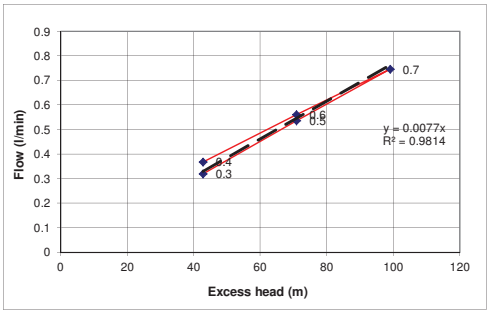
Drill Hole ID	KAX-14-130	True depth to ground water	12.9 m
Hole Plunge	70 deg	Gauge height above ground	1.8 m
Test Interval from	71.25 m to 83.5 m	Ground surface elevation	m
Test length	12.25 m	Static Head	144.21 kPa
Hole diameter	0.096 m	= (true gauge height (m) + groundwater depth (m)) x 9.81	

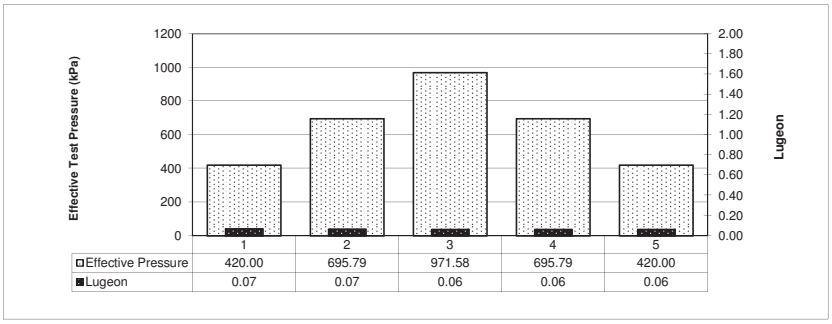
Gauge Pressure (psi)	Net Test Pressure (kPa)	Water Loss																Average flow (l/min)	Take (l/min/m)	Lugeon	Permeability (m/s)
40	420.00	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.37	0.03	0.07	1.07E-08
		Take (L/min)	0.320	0.460	0.370	0.350	0.330	0.370	0.350	0.320	0.380	0.430									
		Take (l/min)	0.320	0.460	0.370	0.350	0.330	0.370	0.350	0.320	0.380	0.430	0.000	0.000							
80	695.79	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.56	0.05	0.07	9.89E-09
		Take (L/min)	0.620	0.550	0.600	0.560	0.560	0.550	0.550	0.550	0.550	0.550	0.550	0.550							
		Take (l/min)	0.620	0.550	0.600	0.560	0.560	0.550	0.550	0.550	0.550	0.550	0.550	0.550							
120	971.58	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.75	0.06	0.06	9.41E-09
		Take (L/min)	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.740	0.740	0.730								
		Take (l/min)	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.740	0.740	0.730	0.000	0.000	0.000	0.000				
80	695.79	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.54	0.04	0.06	9.45E-09
		Take (L/min)	0.520	0.550	0.570	0.530	0.550	0.530	0.520	0.580	0.490	0.530									
		Take (l/min)	0.520	0.550	0.570	0.530	0.550	0.530	0.520	0.580	0.490	0.530	0.000	0.000	0.000	0.000	0.000				
40	420.00	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.32	0.03	0.06	9.33E-09
		Take (L/min)	0.330	0.300	0.320	0.340	0.310	0.350	0.310	0.330	0.310	0.300									
		Take (l/min)	0.330	0.300	0.320	0.340	0.310	0.350	0.310	0.330	0.310	0.300									

Test Pressure = Gauge pressure + static head - friction losses. **Note: friction losses ignored for this calculation.**

One Lugeon = 1 litre per minute per metre at a pressure of 10 bars.

K = Flow x ln(2 x Test Length/Hole diameter) / (2 x pi xTest length x Net head of water table at centre of test section) **Ref. Hoek and Bray.**





Approximate Permeability (m/s)

Min k =	9.3E-09
Max k =	1.1E-08
Avg K =	9.8E-09
Best fit K =	9.6E-09

Flow Type Interpretation

Laminar	Yes
Turbulant	No
Washout	No
Swelling	No
Hydrofracturing	No

Comments

Ground water depth taken prior to packer test.

PACKER TEST CALCULATION SHEET

Klohn Crippen Berger

PROJECT	AJAX GW Study	**PROJECT NO.**	M09871A01	**DATE**	2-May-14

Drill Hole ID KAX-14-130

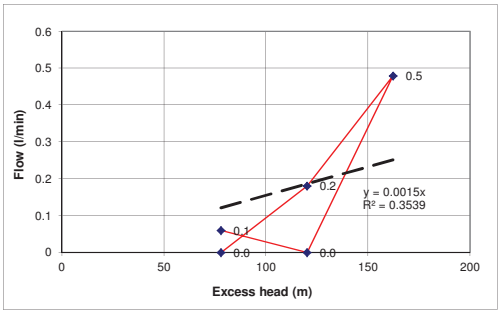
Hole Plunge	70	deg	True depth to ground water	34	m
Test Interval from	83.25	m to 109 m	Gauge height above ground	1.8	m
Test length	25.75	m	Ground surface elevation		m
Hole diameter	0.096	m	Static Head	351.20	kPa
			= (true gauge height (m) + groundwater depth (m)) x 9.81		

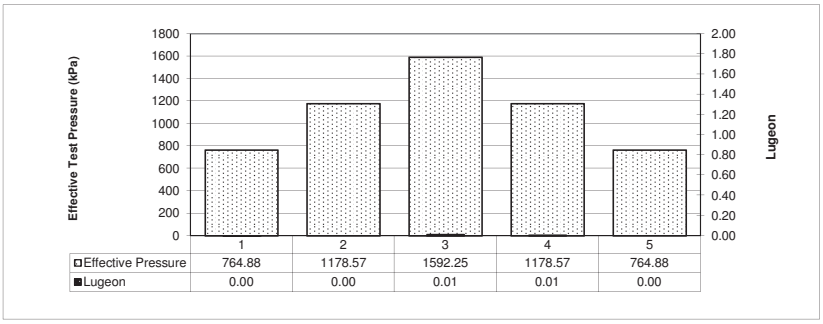
Gauge Pressure (psi)	Net Test Pressure (kPa)	Water Loss																Average flow (l/min)	Take (l/min/m)	Lugeon	Permeability (m/s)
60	764.88	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.06	0.00	0.00	5.20E-10
		Take (L/min)	0.000	0.050	0.030	0.130	0.080	0.010	0.000	0.000	0.000	0.000									
		Take (l/min)	0.000	0.050	0.030	0.130	0.080	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000				
120	1178.57	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.00	0.00	0.00	0.00E+00
		Take (L/min)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000									
		Take (l/min)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000				
180	1592.25	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.48	0.02	0.01	1.99E-09
		Take (L/min)	0.420	0.540	0.530	0.450	0.480	0.530	0.480	0.420	0.420	0.520									
		Take (l/min)	0.420	0.540	0.530	0.450	0.480	0.530	0.480	0.420	0.420	0.520	0.000	0.000	0.000						
120	1178.57	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.18	0.01	0.01	1.02E-09
		Take (L/min)	0.160	0.210	0.210	0.220	0.170	0.000	0.000	0.060	0.000	0.080	0.180	0.250	0.250	0.200	0.180				
		Take (l/min)	0.160	0.210	0.210	0.220	0.170	0.000	0.000	0.060	0.000	0.080	0.180	0.250	0.250	0.200	0.180				
60	764.88	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.00	0.00	0.00	0.00E+00
		Take (L/min)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000											
		Take (l/min)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000											

Test Pressure = Gauge pressure + static head - friction losses. **Note: friction losses ignored for this calculation.**

One Lugeon = 1 litre per minute per metre at a pressure of 10 bars.

K = Flow x ln(2 x Test Length/Hole diameter) / (2 x pi xTest length x Net head of water table at centre of test section) **Ref. Hoek and Bray.**





Approximate Permeability (m/s)

Min k =	5.2E-10
Max k =	2.0E-09
Avg K =	1.2E-09
Best fit K =	1.0E-09

Flow Type Interpretation

Laminar	Yes
Turbulant	No
Washout	No
Swelling	No
Hydrofracturing	No

Comments

Ground water depth taken prior to packer test.
No measureable flow observed at P2 and P5 pressure stages; average K excludes these stages.

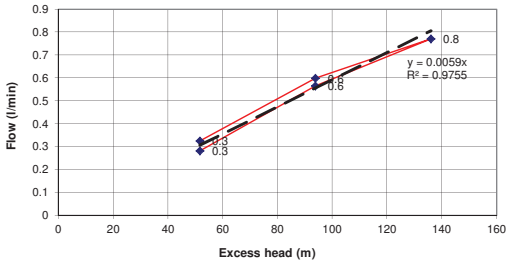
PACKER TEST CALCULATION SHEET

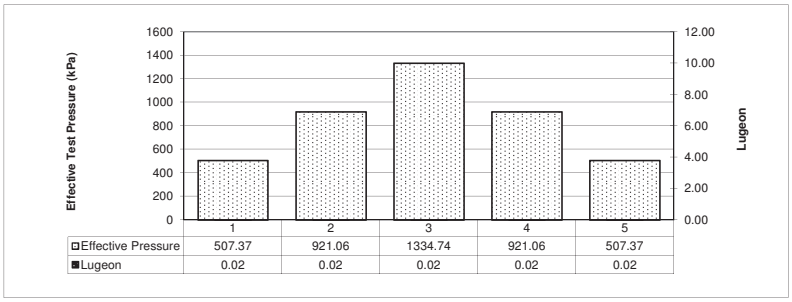
Klohn Crippen Berger

PROJECT	AJAX GW Study	**PROJECT NO.**	M09871A01	**DATE**	3-May-14
Drill Hole ID	KAX-14-130	True depth to ground water	7.75 m		
Hole Plunge	70 deg	Gauge height above ground	1.8 m		
Test Interval from	110.25 m to 137.5 m	Ground surface elevation	m		
Test length	27.25 m	Static Head	93.69 kPa		
Hole diameter	0.096 m	= (true gauge height (m) + groundwater depth (m)) x 9.81			

Gauge Pressure (psi)	Net Test Pressure (kPa)	Water Loss																Average flow (l/min)	Take (l/min/m)	Lugeon	Permeability (m/s)
		Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14				
60	507.37	Take (L/min)	0.340	0.330	0.340	0.310	0.330	0.310	0.330	0.310	0.350	0.300						0.33	0.01	0.02	4.05E-09
		Take (l/min)	0.340	0.330	0.340	0.310	0.330	0.310	0.330	0.310	0.350	0.300	0.000	0.000	0.000	0.000	0.000				
		Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14				
120	921.06	Take (L/min)	0.620	0.630	0.590	0.610	0.580	0.580	0.580	0.600	0.570	0.620	0.620	0.600	0.580			0.60	0.02	0.02	4.11E-09
		Take (l/min)	0.620	0.630	0.590	0.610	0.580	0.580	0.580	0.600	0.570	0.620	0.620	0.600	0.580	0.000	0.000				
		Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14				
180	1334.74	Take (L/min)	0.790	0.780	0.770	0.760	0.790	0.760	0.780	0.740	0.780	0.750	0.780	0.810	0.720	0.780		0.77	0.03	0.02	3.65E-09
		Take (l/min)	0.790	0.780	0.770	0.760	0.790	0.760	0.780	0.740	0.780	0.750	0.780	0.810	0.720	0.780	0.000				
		Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14				
120	921.06	Take (L/min)	0.570	0.580	0.580	0.590	0.570	0.590	0.550	0.600	0.490	0.560	0.530	0.570				0.57	0.02	0.02	3.88E-09
		Take (l/min)	0.570	0.580	0.580	0.590	0.570	0.590	0.550	0.600	0.490	0.560	0.530	0.570							
		Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14				
60	507.37	Take (L/min)	0.250	0.290	0.260	0.290	0.230	0.290	0.290	0.290	0.300	0.300	0.280	0.300	0.280	0.280	0.300	0.28	0.01	0.02	3.51E-09
		Take (l/min)	0.250	0.290	0.260	0.290	0.230	0.290	0.290	0.290	0.300	0.300	0.280	0.300	0.280	0.280	0.300				

Test Pressure = Gauge pressure + static head - friction losses. **Note: friction losses ignored for this calculation.**
One Lugeon = 1 litre per minute per metre at a pressure of 10 bars.
K = Flow x ln(2 x Test Length/Hole diameter) / (2 x pi xTest length x Net head of water table at centre of test section) **Ref. Hoek and Bray.**





Approximate Permeability (m/s)

Min k =	3.5E-09
Max k =	4.1E-09
Avg K =	3.8E-09
Best fit K =	3.8E-09

Flow Type Interpretation

Laminar	Yes
Turbulant	No
Washout	No
Swelling	No
Hydrofracturing	No

Comments

Ground water depth taken prior to packer test.

PACKER TEST CALCULATION SHEET

Klohn Crippen Berger

PROJECT	AJAX GW Study	**PROJECT NO.**	M09871A01	**DATE**	30-Apr-14

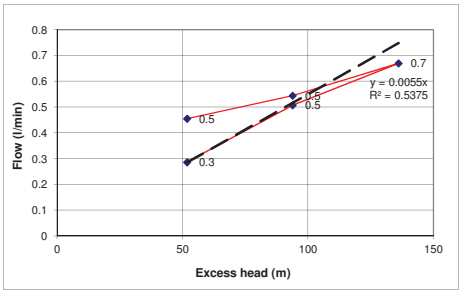
Drill Hole ID	KAX-14-130	True depth to ground water	7.75 m
Hole Plunge	70 deg	Gauge height above ground	1.8 m
Test Interval from	138.75 m to 169 m	Ground surface elevation	m
Test length	30.25 m	Static Head	93.69 kPa
Hole diameter	0.096 m	= (true gauge height (m) + groundwater depth (m)) x 9.81	

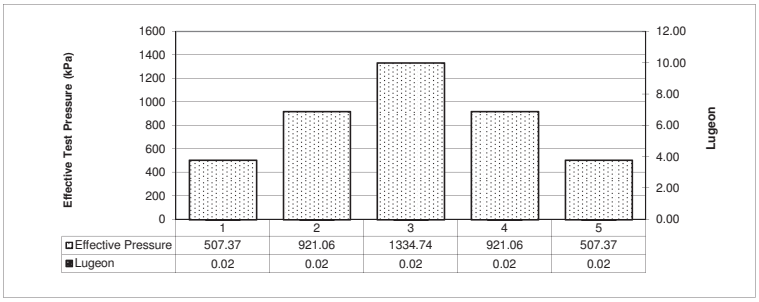
Gauge Pressure (psi)	Net Test Pressure (kPa)	Water Loss																Average flow (l/min)	Take (l/min/m)	Lugeon	Permeability (m/s)
		Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14				
		Take (L/min)	0.450	0.430	0.490	0.470	0.470	0.440	0.470	0.430	0.460	0.440									
60	507.37																	0.46	0.02	0.03	5.19E-09
		Take (l/min)	0.450	0.430	0.490	0.470	0.470	0.440	0.470	0.430	0.460	0.440	0.000	0.000	0.000	0.000	0.000				
		Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14				
		Take (L/min)	0.550	0.550	0.550	0.550	0.550	0.550	0.550	0.500	0.550	0.550									
120	921.06																	0.55	0.02	0.02	3.42E-09
		Take (l/min)	0.550	0.550	0.550	0.550	0.550	0.550	0.550	0.500	0.550	0.550	0.000	0.000	0.000	0.000	0.000				
		Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14				
		Take (L/min)	0.670	0.680	0.700	0.700	0.650	0.750	0.600	0.650	0.680	0.620	0.700	0.630	0.680						
180	1334.74																	0.67	0.02	0.02	2.90E-09
		Take (l/min)	0.670	0.680	0.700	0.700	0.650	0.750	0.600	0.650	0.680	0.620	0.700	0.630	0.680	0.000	0.000				
		Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14				
		Take (L/min)	0.520	0.530	0.500	0.500	0.500	0.500	0.530	0.480	0.520	0.480	0.520								
120	921.06																	0.51	0.02	0.02	3.19E-09
		Take (l/min)	0.520	0.530	0.500	0.500	0.500	0.500	0.530	0.480	0.520	0.480	0.520								
		Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14				
		Take (L/min)	0.300	0.300	0.290	0.280	0.320	0.300	0.310	0.200	0.290	0.280									
60	507.37																	0.29	0.01	0.02	3.27E-09
		Take (l/min)	0.300	0.300	0.290	0.280	0.320	0.300	0.310	0.200	0.290	0.280	0.000	0.000	0.000	0.000	0.000				

Test Pressure = Gauge pressure + static head - friction losses. **Note: friction losses ignored for this calculation.**

One Lugeon = 1 litre per minute per metre at a pressure of 10 bars.

K = Flow x ln(2 x Test Length/Hole diameter) / (2 x pi xTest length x Net head of water table at centre of test section) **Ref. Hoek and Bray.**





Approximate Permeability (m/s)

Min k =	2.9E-09
Max k =	5.2E-09
Avg K =	3.6E-09
Best fit K =	3.2E-09

Flow Type Interpretation

Laminar	Yes
Turbulant	No
Washout	No
Swelling	No
Hydrofracturing	No

Comments

Ground water depth assumed to be 7.75 m.

PACKER TEST CALCULATION SHEET

Klohn Crippen Berger

PROJECT	AJAX GW Study	**PROJECT NO.**	M09871A01
DATE	5-May-14		

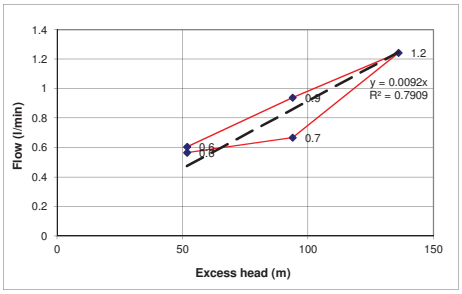
Drill Hole ID	KAX-14-130	True depth to ground water	7.75 m
Hole Plunge	70 deg	Gauge height above ground	1.8 m
Test Interval from	189.75 m to 226 m	Ground surface elevation	m
Test length	36.25 m	Static Head	93.69 kPa
Hole diameter	0.096 m	= (true gauge height (m) + groundwater depth (m)) x 9.81	

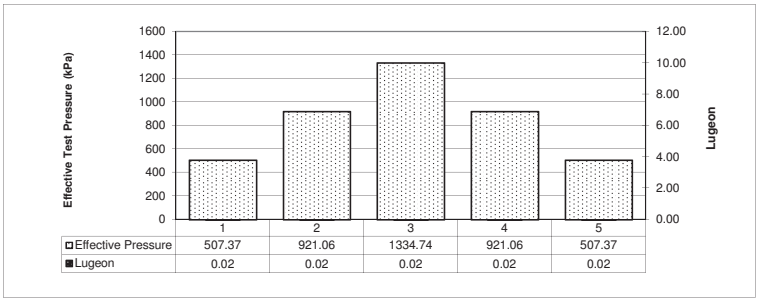
Gauge Pressure (psi)	Net Test Pressure (kPa)	Water Loss																Average flow (l/min)	Take (l/min/m)	Lugeon	Permeability (m/s)
60	507.37	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.60	0.02	0.03	5.92E-09
		Take (L/min)	0.670	0.690	0.650	0.540	0.510	0.590	0.610	0.590	0.590	0.590	0.620								
		Take (l/min)	0.670	0.690	0.650	0.540	0.510	0.590	0.610	0.590	0.590	0.590	0.620	0.000	0.000	0.000	0.000				
120	921.06	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.94	0.03	0.03	5.07E-09
		Take (L/min)	0.970	0.840	0.880	0.960	0.950	0.950	0.950	0.970	0.950	0.970	0.950	0.930							
		Take (l/min)	0.970	0.840	0.880	0.960	0.950	0.950	0.950	0.970	0.950	0.970	0.950	0.930	0.000	0.000	0.000				
180	1334.74	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	1.24	0.03	0.03	4.63E-09
		Take (L/min)	1.270	1.230	1.260	1.260	1.180	1.240	1.250	1.240	1.280	1.250	1.230	1.210	1.280						
		Take (l/min)	1.270	1.230	1.260	1.260	1.180	1.240	1.250	1.240	1.280	1.250	1.230	1.210	1.280	0.000	0.000				
120	921.06	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.67	0.02	0.02	3.61E-09
		Take (L/min)	0.950	0.980	0.950	0.920	0.700	0.150	0.300	0.400											
		Take (l/min)	0.950	0.980	0.950	0.920	0.700	0.150	0.300	0.400	0.000	0.000	0.000								
60	507.37	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.57	0.02	0.03	5.54E-09
		Take (L/min)	0.540	0.510	0.590	0.580	0.580	0.560	0.590	0.580	0.580	0.540	0.560	0.580							
		Take (l/min)	0.540	0.510	0.590	0.580	0.580	0.560	0.590	0.580	0.580	0.540	0.560	0.580	0.000	0.000	0.000				

Test Pressure = Gauge pressure + static head - friction losses. **Note: friction losses ignored for this calculation.**

One Lugeon = 1 litre per minute per metre at a pressure of 10 bars.

K = Flow x ln(2 x Test Length/Hole diameter) / (2 x pi xTest length x Net head of water table at centre of test section) **Ref. Hoek and Bray.**





Approximate Permeability (m/s)

Min k =	3.6E-09
Max k =	5.9E-09
Avg K =	5.0E-09
Best fit K =	4.7E-09

Flow Type Interpretation

Laminar	Yes
Turbulant	No
Washout	No
Swelling	No
Hydrofracturing	No

Comments

Ground water depth assumed to be 7.75 m.

PACKER TEST CALCULATION SHEET

Klohn Crippen Berger

PROJECT	AJAX GW Study	**PROJECT NO.**	M09871A01
DATE	5-May-14		

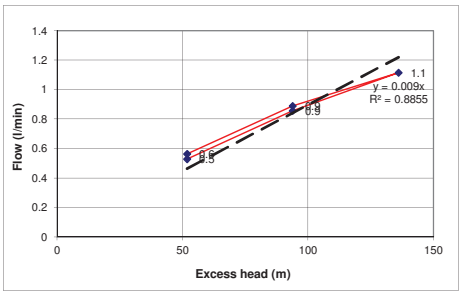
Drill Hole ID	KAX-14-130	True depth to ground water	7.75 m
Hole Plunge	70 deg	Gauge height above ground	1.8 m
Test Interval from	159.75 m to 169.75 m	Ground surface elevation	m
Test length	10 m	Static Head	93.69 kPa
Hole diameter	0.096 m	= (true gauge height (m) + groundwater depth (m)) x 9.81	

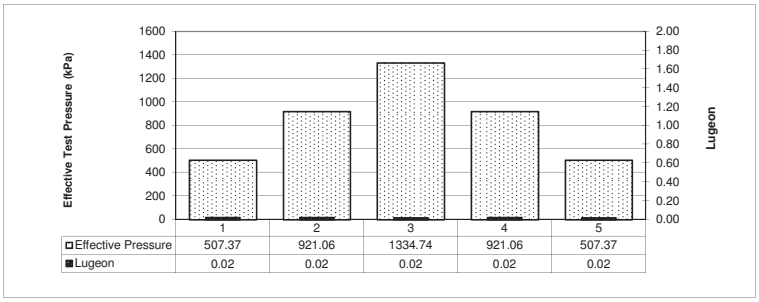
Gauge Pressure (psi)	Net Test Pressure (kPa)	Water Loss																Average flow (l/min)	Take (l/min/m)	Lugeon	Permeability (m/s)
60	507.37	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.56	0.06	0.11	1.61E-08
		Take (L/min)	0.570	0.570	0.570	0.560	0.580	0.570	0.550	0.560	0.550	0.570	0.560	0.560							
		Take (l/min)	0.570	0.570	0.570	0.560	0.580	0.570	0.550	0.560	0.550	0.570	0.560	0.560	0.000	0.000	0.000				
120	921.06	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.89	0.09	0.10	1.39E-08
		Take (L/min)	0.850	0.870	0.920	0.890	0.880	0.890	0.900	0.900	0.880	0.870	0.900	0.950	0.900	0.850					
		Take (l/min)	0.850	0.870	0.920	0.890	0.880	0.890	0.900	0.900	0.880	0.870	0.900	0.950	0.900	0.850	0.000				
180	1334.74	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	1.12	0.11	0.08	1.21E-08
		Take (L/min)	1.100	1.150	1.100	1.050	1.110	1.190	1.150	1.050	1.120	1.130	1.100	1.130	1.150	1.120	1.100				
		Take (l/min)	1.100	1.150	1.100	1.050	1.110	1.190	1.150	1.050	1.120	1.130	1.100	1.130	1.150	1.120	1.100				
120	921.06	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.86	0.09	0.09	1.34E-08
		Take (L/min)	0.850	0.850	0.850	0.850	0.900	0.850	0.850	0.850	0.850	0.900	0.820	0.830	0.900	0.850					
		Take (l/min)	0.850	0.850	0.850	0.850	0.900	0.850	0.850	0.850	0.850	0.900	0.820	0.830	0.900	0.850					
60	507.37	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.53	0.05	0.10	1.51E-08
		Take (L/min)	0.510	0.540	0.540	0.510	0.530	0.550	0.520	0.510	0.540	0.540									
		Take (l/min)	0.510	0.540	0.540	0.510	0.530	0.550	0.520	0.510	0.540	0.540	0.000	0.000	0.000	0.000	0.000				

Test Pressure = Gauge pressure + static head - friction losses. **Note: friction losses ignored for this calculation.**

One Lugeon = 1 litre per minute per metre at a pressure of 10 bars.

K = Flow x ln(2 x Test Length/Hole diameter) / (2 x pi xTest length x Net head of water table at centre of test section) **Ref. Hoek and Bray.**





Approximate Permeability (m/s)

Min k =	1.2E-08
Max k =	1.6E-08
Avg K =	1.4E-08
Best fit K =	1.3E-08

Flow Type Interpretation

Laminar	Yes
Turbulant	No
Washout	No
Swelling	No
Hydrofracturing	No

Comments

Ground water depth assumed to be 7.75 m.

PACKER TEST CALCULATION SHEET

Klohn Crippen Berger

PROJECT	AJAX GW Study	**PROJECT NO.**	M09871A01
DATE	6-May-14		

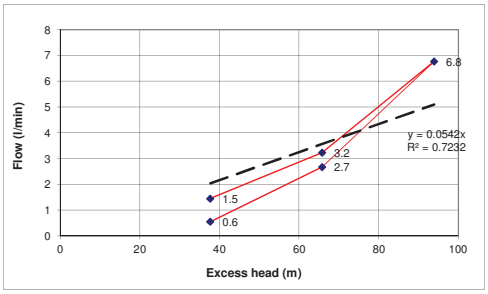
Drill Hole ID	KAX-14-130	True depth to ground water	7.75 m
Hole Plunge	70 deg	Gauge height above ground	1.8 m
Test Interval from	56.25 m to 64.25 m	Ground surface elevation	m
Test length	8 m	Static Head	93.69 kPa
Hole diameter	0.096 m	= (true gauge height (m) + groundwater depth (m)) x 9.81	

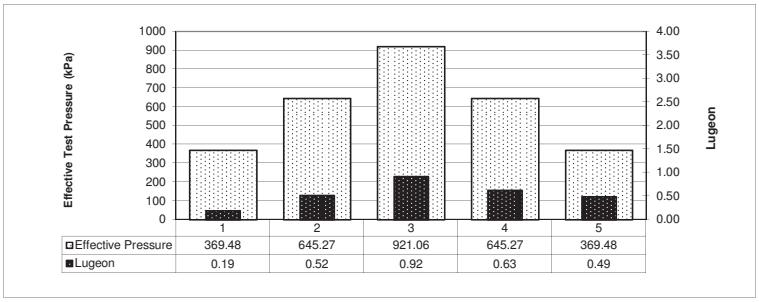
Gauge Pressure (psi)	Net Test Pressure (kPa)	Water Loss																Average flow (l/min)	Take (l/min/m)	Lugeon	Permeability (m/s)
40	369.48	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	0.56	0.07	0.19	2.60E-08
		Take (L/min)	0.550	0.600	0.550	0.520	0.580	0.560	0.540	0.550	0.570	0.550									
		Take (l/min)	0.550	0.600	0.550	0.520	0.580	0.560	0.540	0.550	0.570	0.550	0.000	0.000	0.000	0.000	0.000				
80	645.27	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	2.67	0.33	0.52	7.16E-08
		Take (L/min)	2.850	2.700	2.550	2.650	2.700	2.650	2.800	2.650	2.600	2.650	2.600								
		Take (l/min)	2.850	2.700	2.550	2.650	2.700	2.650	2.800	2.650	2.600	2.650	2.600	0.000	0.000	0.000	0.000				
120	921.06	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	6.78	0.85	0.92	1.27E-07
		Take (L/min)	6.700	6.700	6.700	6.700	6.700	6.800	6.800	6.900	6.900	6.900									
		Take (l/min)	6.700	6.700	6.700	6.700	6.700	6.800	6.800	6.900	6.900	6.900	0.000	0.000	0.000	0.000	0.000				
80	645.27	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	3.24	0.41	0.63	8.68E-08
		Take (L/min)	3.350	3.200	3.100	3.350	3.150	3.200	3.200	3.250	3.350	3.300	3.200								
		Take (l/min)	3.350	3.200	3.100	3.350	3.150	3.200	3.200	3.250	3.350	3.300	3.200								
40	369.48	Time (mins)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	1.46	0.18	0.49	6.80E-08
		Take (L/min)	1.450	1.450	1.450	1.450	1.450	1.450	1.450	1.500	1.450	1.450									
		Take (l/min)	1.450	1.450	1.450	1.450	1.450	1.450	1.450	1.500	1.450	1.450	0.000	0.000	0.000	0.000	0.000				

Test Pressure = Gauge pressure + static head - friction losses. **Note: friction losses ignored for this calculation.**

One Lugeon = 1 litre per minute per metre at a pressure of 10 bars.

K = Flow x ln(2 x Test Length/Hole diameter) / (2 x pi xTest length x Net head of water table at centre of test section) **Ref. Hoek and Bray.**





Approximate Permeability (m/s)

Min k =	2.6E-08
Max k =	1.3E-07
Avg K =	7.6E-08
Best fit K =	9.5E-08

Flow Type Interpretation

Laminar	Yes
Turbulant	No
Washout	No
Swelling	No
Hydrofracturing	No

Comments

Ground water depth assumed to be 7.75 m.

APPENDIX VI

VWP Calibration Certificates

innovation in geotechnical instrumentation

RST Instruments Ltd., 11545 Kingston St., Maple Ridge, British Columbia, Canada V2X 0Z5
Tel: 604 540 1100 • Fax: 604 540 1005 • Toll Free: 1 800 665 5599 (North America only)
e-mail: info@rstinstruments.com • Website: www.rstinstruments.com

Calibration Record

Vibrating Wire Piezometer

Customer:	GEOTECH DRILLING SERVICES LTD.		
Model:	VW2100-2.0		
Serial Number:	**VW28458**		
Mfg Number:	1407321		
Range:	2.0	MPa	
Temperature:	20.2	°C	
Barometric Pressure:	1002.8	millibars	
Work Order Number:	203668		
Cable Length:	210	meters	
Cable Markings:	361358 m - 361568 m		
Cable Colour Code:	Red / Black (Coil)	Green / White	(Thermistor)
Cable Type:	EL380004		
Thermistor Type:	3	kΩ	

Applied Pressure (MPa)	First Reading (B units)	Second Reading (B units)	Average Reading (B units)	Calculated Linear (MPa)	Linearity Error (% FS)	Polynomial Error (% FS)
0.0	8912	8913	8913	0.003	0.17	-0.01
0.4	8234	8234	8234	0.400	-0.01	0.02
0.8	7554	7554	7554	0.797	-0.15	-0.01
1.2	6869	6870	6870	1.197	-0.15	-0.01
1.6	6181	6181	6181	1.599	-0.04	0.00
2.0	5489	5489	5489	2.004	0.18	0.00
				Max. Error (%):	0.18	0.02

Linear Calibration Factor:	**C.F.=**	**0.00058427 MPa/B unit**
Regression Zero:	**At Calibration =**	**8918.2 B unit**
Temperature Correction Factor:	**Tk =**	**0.0001586 MPa/°C rise**

Polynomial Gage Factors (MPa) **A:** -2.2594E-09 **B:** -0.00055173 **C:** 5.0966

Pressure is calculated with the following equations:

Linear: $P(MPa) = C.F.(Li-Lc) - [Tk(Ti-Tc)] + [0.00010(Bi-Bc)]$

Polynomial: $P(MPa) = A(Lc)^2 + BLc + C + Tk(Tc-Ti) - [0.00010(Bc-Bi)]$

	Date (dd/mm/yy)	VW Readout Pos. B (Li)	Temp °C (Ti)	Baro (Bi)
Shipped Zero Readings:	10-Apr-14	8923	24.7	1025.5

Li, Lc = initial (at installation) and current readings
Ti, Tc = initial (at installation) and current temperature, in °C
Bi, Bc = initial (at installation) and current barometric pressure readings, in millibars
B units = B scale output of VW 2102, VW 2104, VW 2106 and DT 2011 readouts
B units = Hz^2 / 1000 ie: 1700Hz = 2890 B units

Technician: Z. Soos ZS Date: 10-Apr-14

This instrument has been calibrated using standards traceable to the NIST in compliance with ANSI Z540-1

Applied Science Technologists and Technicians of British Columbia
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Document Number: ELL0143H

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RST Instruments Ltd., 11545 Kingston St., Maple Ridge, British Columbia, Canada V2X 0Z5
Tel: 604 540 1100 • Fax: 604 540 1005 • Toll Free: 1 800 665 5599 (North America only)
e-mail: info@rstinstruments.com • Website: www.rstinstruments.com

Calibration Record

Vibrating Wire Piezometer

Customer:	GEOTECH DRILLING SERVICES LTD.		
Model:		VW2100-2.0	
Serial Number:		**VW28459**	
Mfg Number:		1407322	
Range:		2.0	MPa
Temperature:		20.2	°C
Barometric Pressure:		1002.8	millibars
Work Order Number:		203668	
Cable Length:		210	meters
Cable Markings:		361570 m - 361780 m	
Cable Colour Code:	Red / Black (Coil)	Green / White	(Thermistor)
Cable Type:		EL380004	
Thermistor Type:		3	kΩ

Applied Pressure (MPa)	First Reading (B units)	Second Reading (B units)	Average Reading (B units)	Calculated Linear (MPa)	Linearity Error (% FS)	Polynomial Error (% FS)
0.0	8896	8897	8897	0.004	0.19	-0.01
0.4	8226	8226	8226	0.400	-0.02	0.02
0.8	7553	7553	7553	0.797	-0.16	0.00
1.2	6876	6876	6876	1.197	-0.17	-0.01
1.6	6194	6194	6194	1.599	-0.04	0.00
2.0	5508	5508	5508	2.004	0.20	0.00
			Max. Error (%):		0.20	0.02

Linear Calibration Factor:	**C.F.=**	**0.00059032 MPa/B unit**
Regression Zero:	**At Calibration =**	**8902.9 B unit**
Temperature Correction Factor:	**Tk =**	**-0.00003098 MPa/°C rise**

Polynomial Gage Factors (MPa) **A:** -2.6059E-09 **B:** -0.00055278 **C:** 5.1239

Pressure is calculated with the following equations:

Linear: $P(MPa) = C.F.(Li-Lc) - [Tk(Ti-Tc)] + [0.00010(Bi-Bc)]$

Polynomial: $P(MPa) = A(Lc)^2 + BLc + C + Tk(Tc-Ti) - [0.00010(Bc-Bi)]$

	Date (dd/mm/yy)	VW Readout Pos. B (Li)	Temp °C (Ti)	Baro (Bi)
Shipped Zero Readings:	10-Apr-14	8905	24.4	1025.5

Li, Lc = initial (at installation) and current readings
Ti, Tc = initial (at installation) and current temperature, in °C
Bi, Bc = initial (at installation) and current barometric pressure readings, in millibars
B units = B scale output of VW 2102, VW 2104, VW 2106 and DT 2011 readouts
B units = $Hz^2 / 1000$ ie: 1700Hz = 2890 B units

Technician: Z. Soos ZS Date: 10-Apr-14

Applied Science Technologists and Technicians of British Columbia 22724 A.C. AL CULLEY ASCT

This instrument has been calibrated using standards traceable to the NIST in compliance with ANSI Z540-1

Document Number: ELL0143H

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Certificate of Compliance

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RST Instruments Ltd., 11545 Kingston St., Maple Ridge, British Columbia, Canada V2X 0Z5
Tel: 604 540 1100 • Fax: 604 540 1005 • Toll Free: 1 800 665 5599 (North America only)
e-mail: info@rstinstruments.com • Website: www.rstinstruments.com

Model DT2011B Vibrating Wire Data Logger FW Ver: 2.07

The DT2011B is designed to meet specifications without adjustments of any kind. This is to certify that s/n DT08309 has been tested to, and meets, the following specifications:

Indicated B units at 3.0000 kHz: 9000.0 ± 0.5
Indicated °C at 3000.0 ohms: 25.0 ± 0.1
Idle current in micro amperes: 20 ± 10
Correct function with VW piezometer

Technician: K.Hicks Date: April 3, 2014

Applicable standards: Agilent 34401A SN 36053118, Tektronics CMC251 SN TW53715, VW2100-100 SN 56812

ELL0158E

Certificate of Compliance

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e-mail: info@rstinstruments.com • Website: www.rstinstruments.com

Model DT2011B Vibrating Wire Data Logger FW Ver: 2.07

The DT2011B is designed to meet specifications without adjustments of any kind. This is to certify that s/n DT08310 has been tested to, and meets, the following specifications:

Indicated B units at 3.0000 kHz: 9000.0 ± 0.5
Indicated °C at 3000.0 ohms: 25.0 ± 0.1
Idle current in micro amperes: 20 ± 10
Correct function with VW piezometer

Technician: K.Hicks Date: April 3, 2014

Applicable standards: Agilent 34401A SN 36053118, Tektronics CMC251 SN TW53715, VW2100-100 SN 56812

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Tel: 604 540 1100 • Fax: 604 540 1005 • Toll Free: 1 800 665 5599 (North America only)
e-mail: info@rstinstruments.com • Website: www.rstinstruments.com

Calibration Record

Vibrating Wire Piezometer

Customer:	GEOTECH DRILLING SERVICES LTD		
Model:	VW2100-2.0		
Serial Number:	**VW28708**		
Mfg Number:	1410654		
Range:	2.0	MPa	
Temperature:	23.8	°C	
Barometric Pressure:	992.5	millibars	
Work Order Number:	203799		
Cable Length:	210	meters	
Cable Markings:	432010 m - 432221 m		
Cable Colour Code:	Red / Black (Coil)	Green / White	(Thermistor)
Cable Type:	EL380004		
Thermistor Type:	3	kΩ	

Applied Pressure (MPa)	First Reading (B units)	Second Reading (B units)	Average Reading (B units)	Calculated Linear (MPa)	Linearity Error (% FS)	Polynomial Error (% FS)
0.0	8784	8784	8784	0.003	0.17	0.00
0.4	8119	8119	8119	0.399	-0.03	0.00
0.8	7451	7451	7451	0.797	-0.14	-0.01
1.2	6779	6779	6779	1.197	-0.14	0.00
1.6	6103	6104	6104	1.599	-0.03	0.01
2.0	5425	5425	5425	2.003	0.17	0.00
			Max. Error (%):		0.17	0.01

Linear Calibration Factor:	**C.F.=**	**0.00059539 MPa/B unit**
Regression Zero:	**At Calibration =**	**8789.8 B unit**
Temperature Correction Factor:	**Tk =**	**0.0001768 MPa/°C rise**

Polynomial Gage Factors (MPa) **A:** -2.2968E-09 **B:** -0.00056276 **C:** 5.1205

Pressure is calculated with the following equations:

Linear: $P(MPa) = C.F.(Li-Lc) - [Tk(Ti-Tc)] + [0.00010(Bi-Bc)]$

Polynomial: $P(MPa) = A(Lc)^2 + BLc + C + Tk(Tc-Ti) - [0.00010(Bc-Bi)]$

	Date (dd/mm/yy)	VW Readout Pos. B (Li)	Temp °C (Ti)	Baro (Bi)
Shipped Zero Readings:	30-Apr-14	8781	21.4	1029.9

Li, Lc = initial (at installation) and current readings
Ti, Tc = initial (at installation) and current temperature, in °C
Bi, Bc = initial (at installation) and current barometric pressure readings, in millibars
B units = B scale output of VW 2102, VW 2104, VW 2106 and DT 2011 readouts
B units = Hz^2 / 1000 ie: 1700Hz = 2890 B units

Technician: Z. Soos ZS Date: 30-Apr-14

This instrument has been calibrated using standards traceable to the NIST in compliance with ANSI Z540-1

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e-mail: info@rstinstruments.com • Website: www.rstinstruments.com

Calibration Record

Vibrating Wire Piezometer

Customer:	GEOTECH DRILLING SERVICES LTD		
Model:	VW2100-2.0		
Serial Number:	**VW28709**		
Mfg Number:	1410655		
Range:	2.0	MPa	
Temperature:	23.8	°C	
Barometric Pressure:	992.5	millibars	
Work Order Number:	203799		
Cable Length:	210	meters	
Cable Markings:	431798 m - 432009 m		
Cable Colour Code:	Red / Black (Coil)	Green / White	(Thermistor)
Cable Type:	EL380004		
Thermistor Type:	3	kΩ	

Applied Pressure (MPa)	First Reading (B units)	Second Reading (B units)	Average Reading (B units)	Calculated Linear (MPa)	Linearity Error (% FS)	Polynomial Error (% FS)
0.0	8787	8786	8787	0.004	0.21	-0.01
0.4	8116	8116	8116	0.399	-0.03	0.01
0.8	7442	7442	7442	0.797	-0.17	0.01
1.2	6764	6764	6764	1.196	-0.19	-0.01
1.6	6081	6081	6081	1.599	-0.06	-0.01
2.0	5392	5393	5393	2.005	0.23	0.01
			Max. Error (%):		0.23	0.01

Linear Calibration Factor:	**C.F.=**	**0.00058939**	**MPa/B unit**
Regression Zero:	**At Calibration =**	**8793.6**	**B unit**
Temperature Correction Factor:	**Tk =**	**0.0001722**	**MPa/°C rise**

Polynomial Gage Factors (MPa) A: -2.8792E-09 B: -0.00054856 C: 5.0420

Pressure is calculated with the following equations:

Linear: $P(MPa) = C.F.(Li-Lc) - [Tk(Ti-Tc)] + [0.00010(Bi-Bc)]$

Polynomial: $P(MPa) = A(Lc)^2 + BLc + C + Tk(Tc-Ti) - [0.00010(Bc-Bi)]$

	Date (dd/mm/yy)	VW Readout Pos. B (Li)	Temp °C (Ti)	Baro (Bi)
Shipped Zero Readings:	30-Apr-14	8784	21.7	1029.1

Li, Lc = initial (at installation) and current readings
Ti, Tc = initial (at installation) and current temperature, in °C
Bi, Bc = initial (at installation) and current barometric pressure readings, in millibars
B units = B scale output of VW 2102, VW 2104, VW 2106 and DT 2011 readouts
B units = $Hz^2 / 1000$ ie: 1700Hz = 2890 B units

Technician: Z. Soos ZS Date: 30-Apr-14

This instrument has been calibrated using standards traceable to the NIST in compliance with ANSI Z540-1

Association of Applied Science Technologists and Technicians of British Columbia 22724 A.C AL CULLEY ASCT

Document Number: ELL0143H

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Model DT2011B Vibrating Wire Data Logger FW Ver: 2.07

The DT2011B is designed to meet specifications without adjustments of any kind. This is to certify that s/n DT08380 has been tested to, and meets, the following specifications:

Indicated B units at 3.0000 kHz: 9000.0 ± 0.5
Indicated °C at 3000.0 ohms: 25.0 ± 0.1
Idle current in micro amperes: 20 ± 10
Correct function with VW piezometer

Technician: S. Kim SK Date: April 9, 2014
Applicable standards: Agilent 34401A SN 36053118, Tektronics CMC251 SN TW53715, VW2100-100 SN 56812
ELL0158E

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Indicated °C at 3000.0 ohms: 25.0 ± 0.1
Idle current in micro amperes: 20 ± 10
Correct function with VW piezometer

Technician: S. Kim SK Date: April 9, 2014
Applicable standards: Agilent 34401A SN 36053118, Tektronics CMC251 SN TW53715, VW2100-100 SN 56812
ELL0158E

APPENDIX II

Non-Drilling SI Data

KGHM INTERNATIONAL LTD., AJAX PROJECT

REPORT ON

BATHYMETRIC AND SUB-BOTTOM

ACOUSTIC PROFILING SURVEY

JACKO LAKE

KAMLOOPS, B.C.

by

Kevin Payne, P.Eng.

Cliff Candy, P.Geo.

SEPTEMBER, 2014 **PROJECT FGI-1365**

Frontier Geosciences Inc. 237 St. Georges Avenue, North Vancouver, B.C., Canada V7L 4T4
Tel: 604.987.3037 Fax: 604.984.3074

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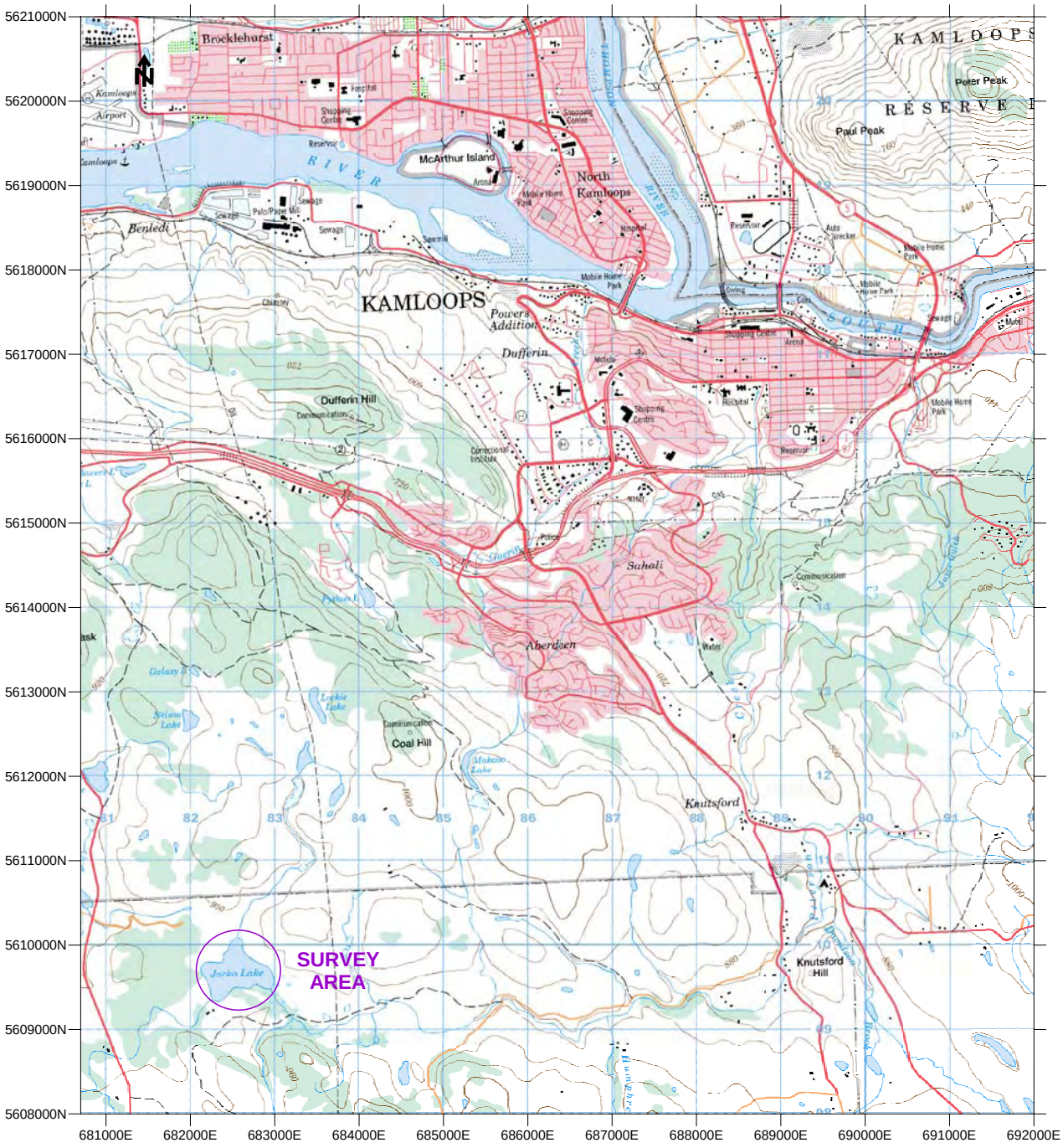
1. INTRODUCTION

In the period September 4 to 6, 2014, Frontier Geosciences Inc. carried out bathymetric and sub-bottom acoustic profiling surveys for KGHM International Ltd. The survey was carried out at Jacko Lake near the Ajax mine site, near Kamloops, B.C. A Survey Location Plan of the area is shown at a scale of 1:75,000 in Figure 1.

In total, approximately 31 kilometres of data were recorded along 78 survey lines. A Site Plan illustrating the locations of the survey lines is presented at a scale of 1:5,000 in Figure 2 of Appendix A. The purpose of the bathymetric and sub-bottom acoustic profiling surveys was to determine the thickness and properties of the lake bed sediment layers. A high frequency sonar was used to measure the depth of the lake. A sub-bottom sonar system was used to profile the shallow layers of sediment. A lower frequency, sub-bottom seismic system was also used to achieve deeper penetration and profile the underlying, basal layer interpreted to be the bedrock.



0 750 1500 2250 3000

METRES

KGHM AJAX MINING INC. JACKO LAKE, KAMLOOPS		
HYDROGRAPHIC SURVEY		
SURVEY LOCATION PLAN		
FRONTIER GEOSCIENCES INC.		
DATE: SEPT. 2014	SCALE 1:75,000	FIG. 1

2. HYDROGRAPHIC SURVEY

2.1 Bathymetric Survey

2.1.1 Equipment

The bathymetric survey was completed using an Imagenex, Model 852 Digital Imaging Sonar. The sonar operates at a frequency of 675 kHz, has a 10 degree beam width, and a 2 centimetre range resolution. The sonar was placed in the water at a depth of 0.46 metres, at the stern of the boat. A Raymarine differential GPS unit was located above the sonar, and the sonar data were correlated with the positioning information, so that the location of each sonar pulse could be contoured for final data presentation and interpretation. The positioning accuracy of the GPS was 3 to 5 metres. The positioning datum of NAD83 in UTM grid coordinates was used on all plans.

2.1.2 Data Processing and Interpretation Procedure

The sonar files were loaded into software written by Frontier Geosciences to convert them into seismic SEG-2 file format. The full waveform data were then loaded into the Seismic Micro Technologies (SMT) 2D/3D seismic interpretation package. The lake bottom was identified in the records and digitized. A value of 1450 m/s was used to convert the sonar range information into depth. This value was determined by an estimate of the salinity and temperature of the lake water, and confirmed with a lead-line measurement taken in the deepest part of the lake. The results were gridded to produce a three dimensional surface image of the lake bottom. The contoured results are shown in depth. The elevation of the lake during the survey could be determined in the future by determining the elevation of the staff gauge in the southeast bay of the lake, which indicated a lake level of 4.6 metres during the survey.

2.2 Sub-Bottom Acoustic Profiling Survey

2.2.1 Equipment

2.2.1.1 Sub-Bottom Sonar System

The EdgeTech 3200 high penetration sub-bottom sonar system, with Model 512 Towfish, is a wideband frequency modulated (FM) sub-bottom profiler utilizing EdgeTech's proprietary full spectrum Compressed High Intensity Radiated Pulse (CHIRP) technology. The system provides high resolution detail capable of identifying near surface layering at sub-metre scale, to a depth of about 20 m, depending on the soil type. The transmitter was set to emit a frequency band from 0.5 to 4.5 kHz. The EdgeTech system was towed just below the surface of the lake, at a depth of about 0.5 metres, and at a distance of 10 metres behind the boat. A Raymarine differential GPS unit was mounted directly over the sub-bottom sonar, and the sonar data were correlated with the positioning information, so that the location of each sonar pulse could be contoured for final data presentation and interpretation.

2.2.1.2 Sub-Bottom Seismic System

The seismic system uses an electric pulser source (precision double coil, vertical boomer), and a pressure-sensitive, multi-element hydrophone receiver array to conduct the acoustic profiling survey. The timing of the pulse was calibrated in milliseconds, and the source has a broad band output with a 250 Hz centre frequency. The reflected signals of the source energy were amplified for viewing and recorded in a field computer. The field computer recorded a seismogram of 200 milliseconds two-way time duration, approximately twice per second. Power for the seismic system was provided from the 120V AC portable generator.

The pulser source was placed in the water, 15 metres astern of the vessel. The midpoint of the receiver hydrophone "eel" was 10 metres behind the source. In operation, pulses from the source were reflected from the bottom and sub-bottom horizons, were summed in the eel hydrophone elements, and were transferred to the recording amplifiers to produce the seismic profile.

2.2.2 Data Processing and Interpretation Procedure

The sub-bottom sonar and sub-bottom seismic data were processed into SEG-Y format and imported into the Seismic Unix (SU) reflection processing package. For the seismic data, the positioning information was processed to account for the lay-back distance of the seismic source and receiver from the GPS receiver. The data and positioning information were then imported into the Seismic Micro Technologies (SMT) 2D/3D seismic interpretation package. This software is a comprehensive 2D/3D seismic interpretation program that provides interpretive and horizon picking tools integrated into a map and section database, data management and display system.

The gridded bathymetry data were also imported into the SMT package, as a horizon overlay on the sub-bottom data sets. The next stage in the analysis was the use of the horizon picking tools to identify subsurface reflectors in the data. The software shows time markers at the intersection of survey lines and tie-lines, facilitating the picking of a consistent event throughout the map area. Reflectors in the higher resolution, sub-bottom sonar data were identified first, and then overlaid onto the lower resolution, deeper penetrating sub-bottom seismic data to expand the interpretation. The identified reflectors were then converted to depth, using an assumed velocity of 1700 m/s for the sub-bottom layering which is typical for saturated sediments. The layer depths and thicknesses were then plotted in colour contour format.

3. GEOPHYSICAL RESULTS

3.1 General

The bathymetric contour plan of Jacko Lake is shown in Figure 3, at a scale of 1:5,000. In general, the lake bottom drops off rapidly from the shorelines to a depth of about 15 metres, where its outline is roughly rectangular in shape. The deepest area of the lake is in the centre, where its outline is roughly square at about 20 meters depth. The maximum depth is 24 metres.

The bathymetric survey coverage was more extensive than the sub-bottom survey coverage, as the shallow water in the five bays of the lake caused too many reverberations in the data, and subsurface reflectors could not be identified. Five sub-bottom boundaries were identified below the lake bottom, the deepest of which was interpreted to be the bedrock surface. Below these, there was also some indication of even deeper events, but these were interpreted to be more likely to be artifacts in the data caused by the multiple reflections and also by acoustic diffraction patterns, and were not real subsurface boundaries.

The contour plan of the interpreted depth to bedrock is shown in Figure 4. The interpreted bedrock and lake bottom surfaces are generally similar, with a main depression in the middle of the lake reaching a bedrock depth of about 43 metres. A second depression in the bedrock lies to northeast of the lake centre, at about 34 metres in depth and elongated in a northwest-southeast direction, roughly parallel to the northeast shoreline of the lake.

The total thickness of sediments measured between the lake bottom and interpreted bedrock surface is shown in Figure 5. In general, there is about 10 metres of sediments overlying the interpreted bedrock. The thickness increases in the two bedrock depressions, reaching 15 to 19 meters.

3.2 Discussion

In Appendix B, Figures 6 and 7 show two example profiles of the sub-bottom data. Figure 6 shows an example of the sub-bottom sonar data, and Figure 7 shows an example of the sub-bottom seismic data, which were collected along the same survey line. In addition to the lake bottom boundary, five sub-bottom boundaries were identified as reflectors in the data. The higher resolution, sub-bottom sonar records were interpreted first. The results were then overlaid onto the seismic records, which are lower resolution but penetrate deeper than the sonar records. The seismic records were used to extend the interpretation from the sonar records, and to interpret the depth of the bedrock surface, which could rarely be seen in the sonar data. For example, on the left side of the sonar data shown in Figure 6, the magenta circles indicate where the depth of sub-bottom boundary No. 4 was identified in the seismic data shown in Figure 7. Similarly, the black circles shown on Figure 6 indicate where the interpreted bedrock boundary was identified in the seismic data. On the left side of Figure 6 the sonar data shows a weak reflector that matched well with the interpreted bedrock boundary identified in the seismic data. Generally, the sonar data did not fully resolve the bedrock surface, but the seismic data did. Conversely the sonar data imaged the sediment interfaces in more detail than the seismic data did.

The depth of sub-bottom boundary No. 1 is shown as a contour plan in Figure 8. The thickness of sub-bottom layer No. 1 is the difference between this boundary and the lake bottom, and is shown as an isopach plan in Figure 9. The contour lines generally follow the lake bottom, and the thickness of this layer is about one to two metres. Sub-bottom boundary No. 1 was the first strong reflector identified below the lake bottom, and was interpreted to represent the depth of firmer sediments below the surficial lake bottom deposits. The isopach plan shown in Figure 9 represents the thickness of these surficial deposits. In the centre of the lake where the bathymetric surface is relatively flat, these surficial deposits were interpreted (based on our experience with similar data) to have locally trapped biogenic gasses within fine grained lake sediments, as a strong return in the sonar data was measured at the lake bottom. This obscured the sub-surface layering visible in the higher frequency sonar data, and the less obscured lower frequency seismic data were used to interpolate layer depths in this area.

The depth of sub-bottom boundary No. 2 is shown as a contour plan in Figure 10. The thickness of sub-bottom layer No. 2 is the difference between this boundary and sub-bottom boundary No. 1, and is shown as an isopach plan in Figure 11. This layer was interpreted to be an additional boundary in the sediment layering of sub-bottom layer No. 3. The response is not as strong as the other boundaries, and this layer was only thick enough (1 to 2 metres)

to be discernible in two areas, one in the north area and one in the west area of the lake. The isopach plan shown in Figure 11 represents the thickness of the materials between the overlying strong reflector, and this weaker intermediate reflector.

The depth of sub-bottom boundary No. 3 is shown as a contour plan in Figure 12. The thickness of sub-bottom layer No. 3 is the difference between this boundary and sub-bottom boundary No. 1, and is shown as an isopach plan in Figure 13. Note that the thickness of this layer includes the thickness of the partial sub-bottom layer No. 2. Sub-bottom boundary No. 3 was interpreted to be the second main boundary in the sediment layering, due to its relatively stronger reflection amplitude. The thickness of this layer of sediments is generally about two metres, except in two zones of additional thickness (4 to 7 metres) which infill depressions in the deepest areas of interpreted bedrock.

The depth of sub-bottom boundary No. 4 is shown as a contour plan in Figure 14. The thickness of sub-bottom layer No. 4 is the difference between this boundary and sub-bottom boundary No. 3, and is shown as an isopach plan in Figure 15. Sub-bottom boundary No. 4 did not create a strong reflector in the sub-bottom sonar data due to its depth, but where it was visible, a strong coincident reflector was found in the seismic data. The strength of this reflector in the seismic data suggests that this may be the boundary between the overlying sediments and a till layer that lies above the bedrock, although this cannot be confirmed directly from the seismic data alone. The thickness of this layer is generally two to three metres, although some areas are thicker, primarily in the centre of the lake where the thickness is about four to eight metres. The isopach plan shown in Figure 15 represents the thickness of the materials between the interpreted till boundary, and the overlying strong reflector in the sediments.

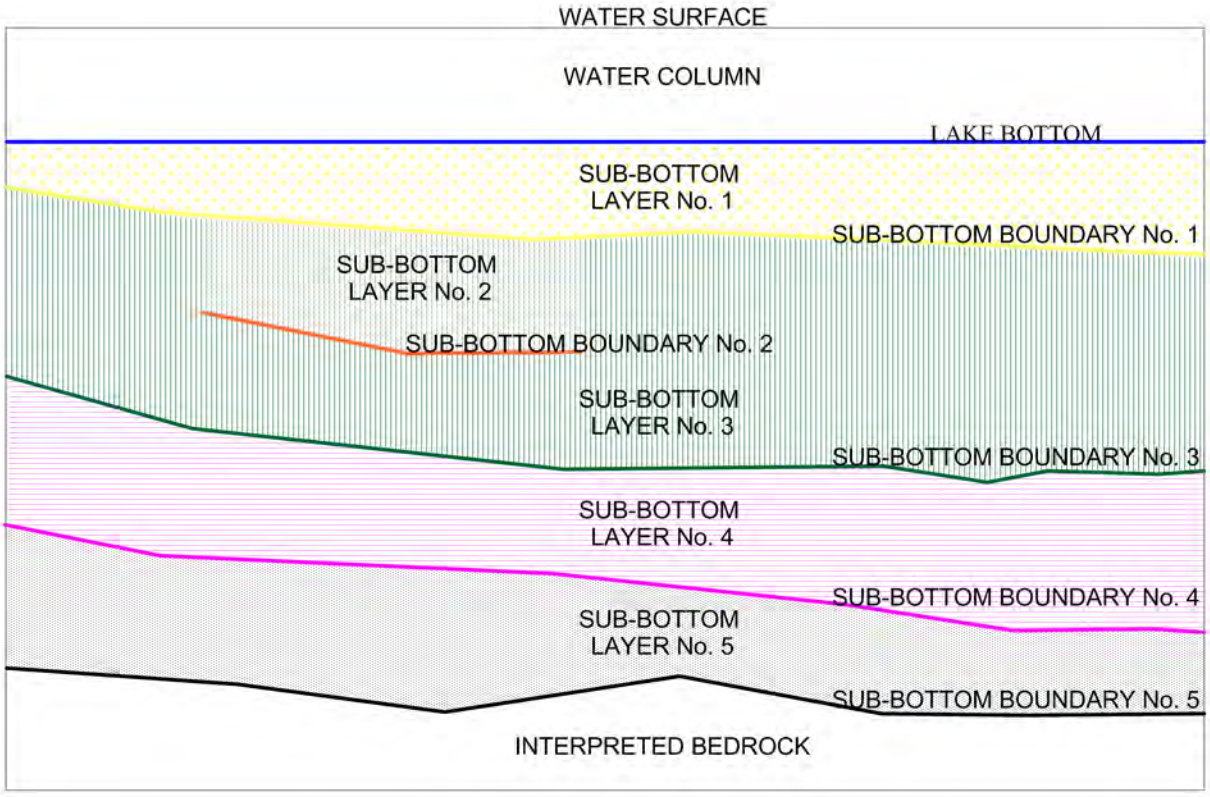
Sub-bottom boundary No. 5 is the interpreted bedrock surface, shown as a contour plan in Figure 4. The thickness of sub-bottom layer No. 5 is the difference between this boundary and sub-bottom boundary No. 4, and is shown as an isopach plan in Figure 16. This layer is interpreted to be till, based on the strength and depth of the reflected seismic energy. The layer thickness ranges from about 2 to 8 metres, and is generally about 4 metres on average.

A summary of the sub-bottom layer boundaries and interpreted material descriptions is listed in the following table, and portrayed in the following sketch:

Table 1: Sub-Bottom Layer Description

Layer	Upper Boundary	Lower Boundary	Minimum Layer Thickness (m)	Maximum Layer Thickness (m)	Typical Layer Thick. (m)	Interpreted Material Description
No. 1	Lake Bottom Bathymetric Surface	Sub-Bottom Boundary No. 1	0	2.5	1-2	Surficial lake bottom deposits.
No. 2	Sub-Bottom Boundary No. 1	Sub-Bottom Boundary No. 2	0.1	4	1-2	Partial layer, additional boundary in Sub-Bottom Layer No. 3
No. 3	Sub-Bottom Boundary No. 1	Sub-Bottom Boundary No. 3	0	7.9	2, some 4-7	Denser sediment layer. (Includes Layer No. 2)
No. 4	Sub-Bottom Boundary No. 3	Sub-Bottom Boundary No. 4 (Interpreted Till)	0.2	9.3	2-3, some 4-8	Denser sediment layer.
No. 5	Sub-Bottom Boundary No. 4 (Interpreted Till)	Sub-Bottom Boundary No. 5 (Interpreted Bedrock)	0.3	9.1	4	Till

Figure 17: Sketch of Sub-Bottom Layers



4. LIMITATIONS

The depths to subsurface boundaries derived from overwater seismic acoustic profiling surveys are generally accepted as accurate to within ten percent of the true depths to the boundaries. In practice, the seismic velocities of sub-bottom materials are not determined in the course of an overwater acoustic profiling investigation, and typical values are adopted from other similar settings. Errors may arise from application of an assumed velocity for saturated materials to determine the depths to sub-surface horizons when only the travel time to the horizon is known. An underestimate of the velocity function would produce depths that are too shallow, with the reverse occurring using an overestimate of velocity. True depths may be established by carrying out overwater seismic refraction surveying or by determining velocities with known borehole intersections. Small errors may also occur in data gridding.

The nature and composition of sub-bottom layers identified in acoustic profiling surveys are not directly determined by inspection of the data. Several indicators such as reflector strength, diffraction patterns, lack of internal reflectors, multiple thin-bed reflectors, depth position, smoothness of reflectors, and reflector relief can provide insight to the interpreter into sub-surface features. For positive identification, the geology of horizons identified in the overwater acoustic profiling survey would have to be established by borehole intersections.

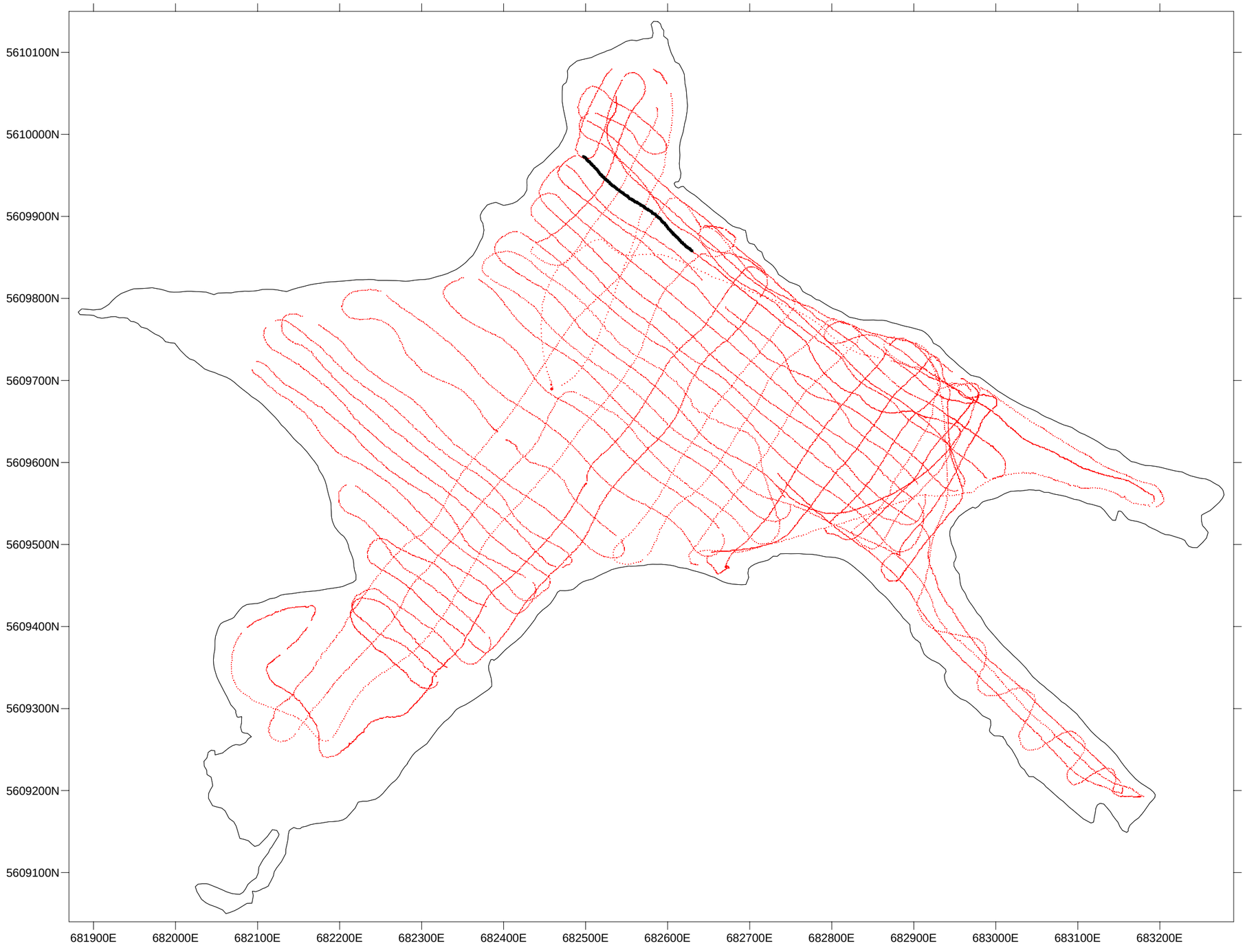
The information in this report is based upon acoustic measurements and field procedures and our interpretation of the data. The geological information is based upon our estimate of the subsurface conditions considering the acoustic profiling data and all other information available to us. The results are interpretive in nature and are considered to be a reasonably accurate presentation of existing lake bottom and subsurface conditions within the limitations of the acoustic profiling methods.

For: Frontier Geosciences Inc.

Kevin Payne, P.Eng.

Cliff Candy, P.Geo.

APPENDIX A



NOTES:

-UTM NAD83 ZONE 10N HORIZONTAL DATUM
-WSC STAFF GAUGE LAKE LEVEL: 4.6 METRES

-BOAT TRACK: +++++
-EXAMPLE PROFILE LOCATION: +++++
(FIGURES 6 AND 7)

0 50 100 150 200

METRES

KGHM AJAX MINING INC.

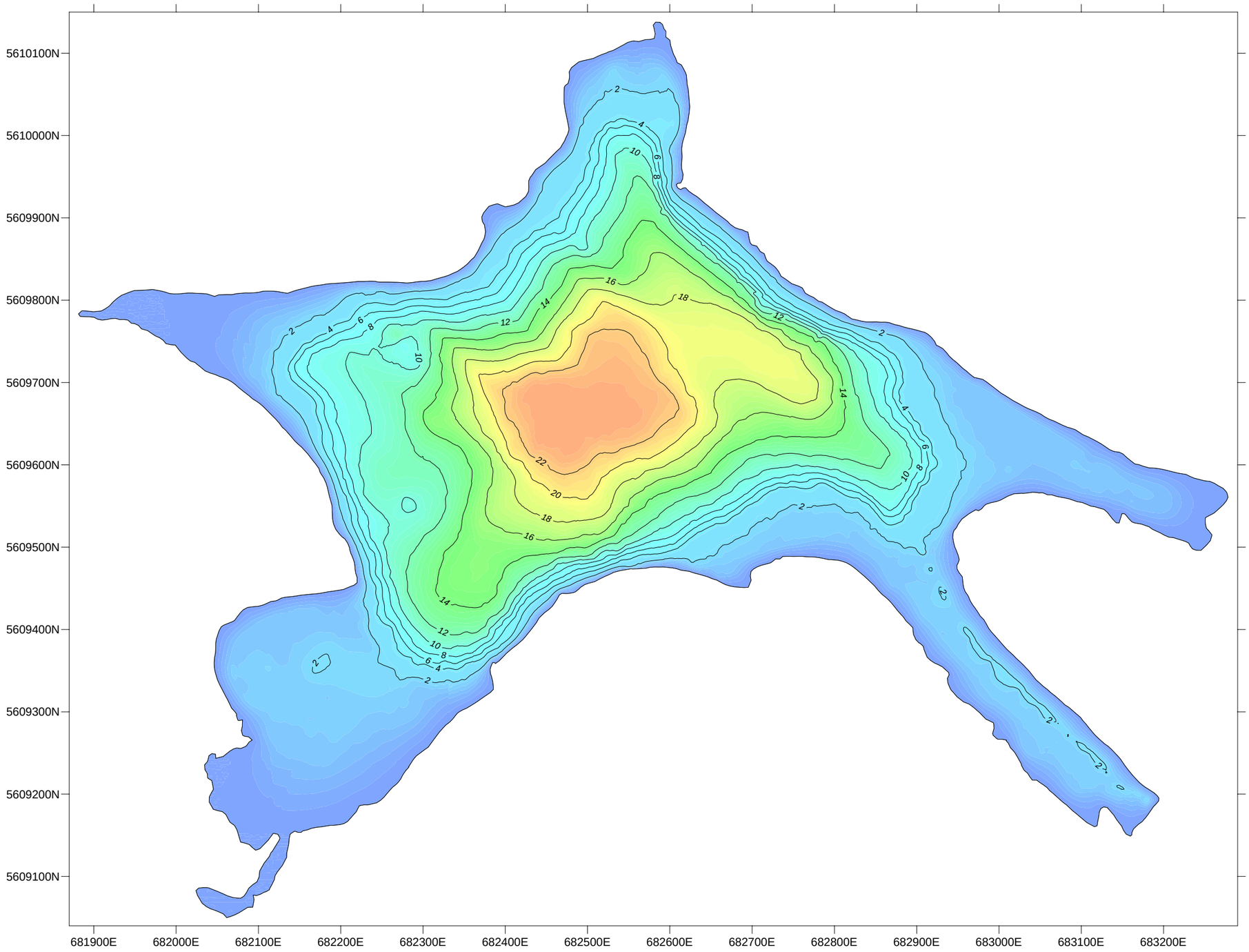
JACKO LAKE, KAMLOOPS

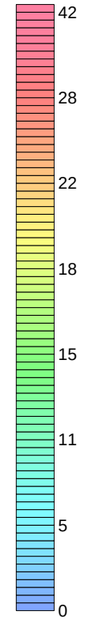
HYDROGRAPHIC SURVEY

SITE PLAN

FRONTIER GEOSCIENCES INC.

DATE: SEPT. 2014	SCALE 1:5,000	FIG. 2

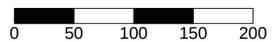




WATER DEPTH (m)

NOTES:

-CONTOUR INTERVAL: 2 METRE
-UTM NAD83 ZONE 10N HORIZONTAL DATUM
-WSC STAFF GAUGE LAKE LEVEL: 4.6 METRES



METRES

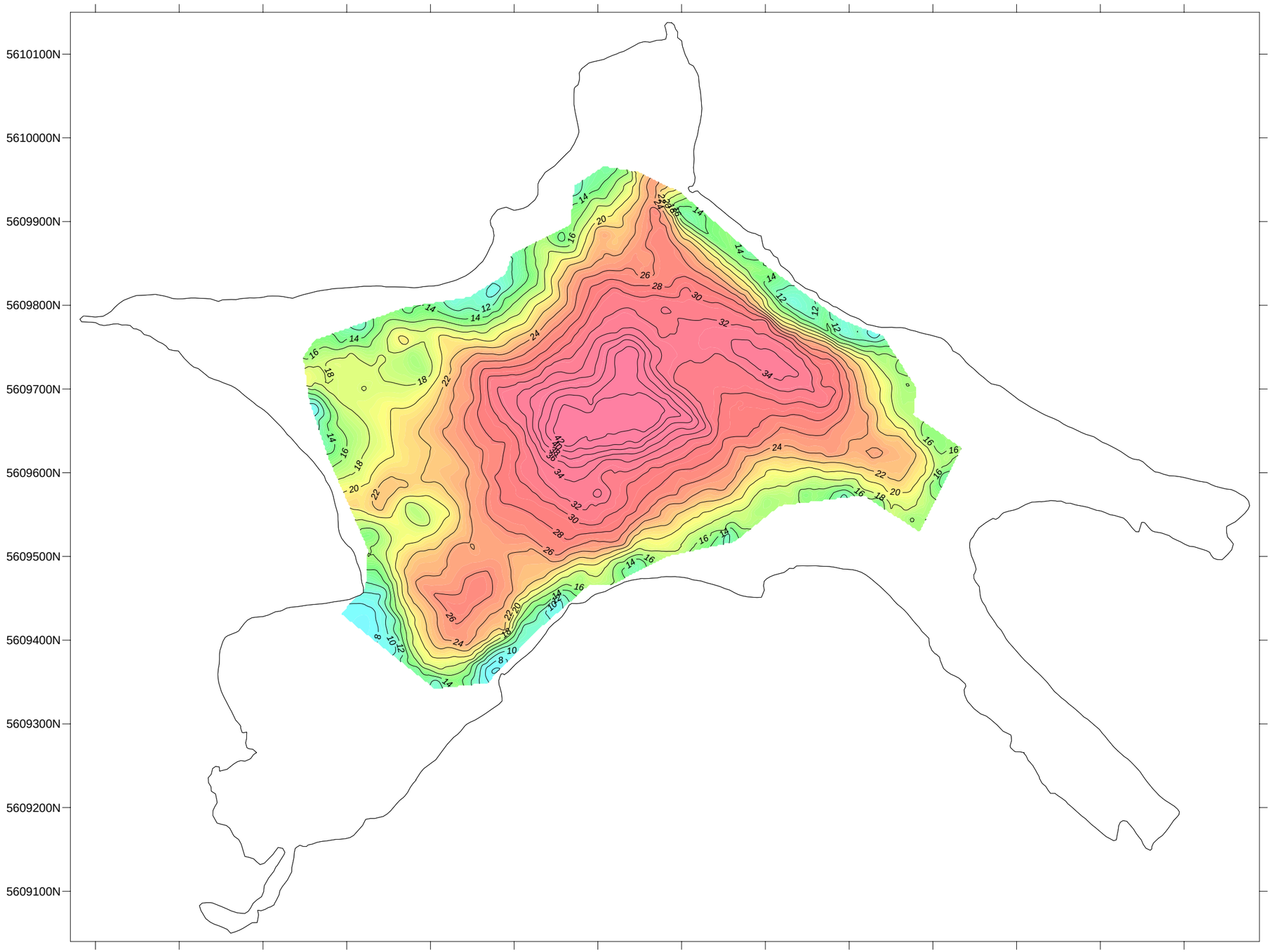
KGHM AJAX MINING INC.
JACKO LAKE, KAMLOOPS

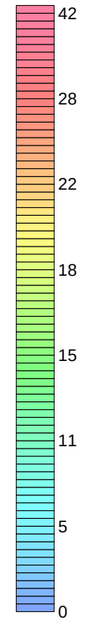
HYDROGRAPHIC SURVEY

BATHYMETRIC CONTOUR PLAN

FRONTIER GEOSCIENCES INC.

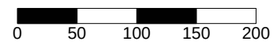
DATE: SEPT. 2014	SCALE 1:5,000	FIG. 3





NOTES:

-CONTOUR INTERVAL: 2 METRE
-UTM NAD83 ZONE 10N HORIZONTAL DATUM
-WSC STAFF GAUGE LAKE LEVEL: 4.6 METRES



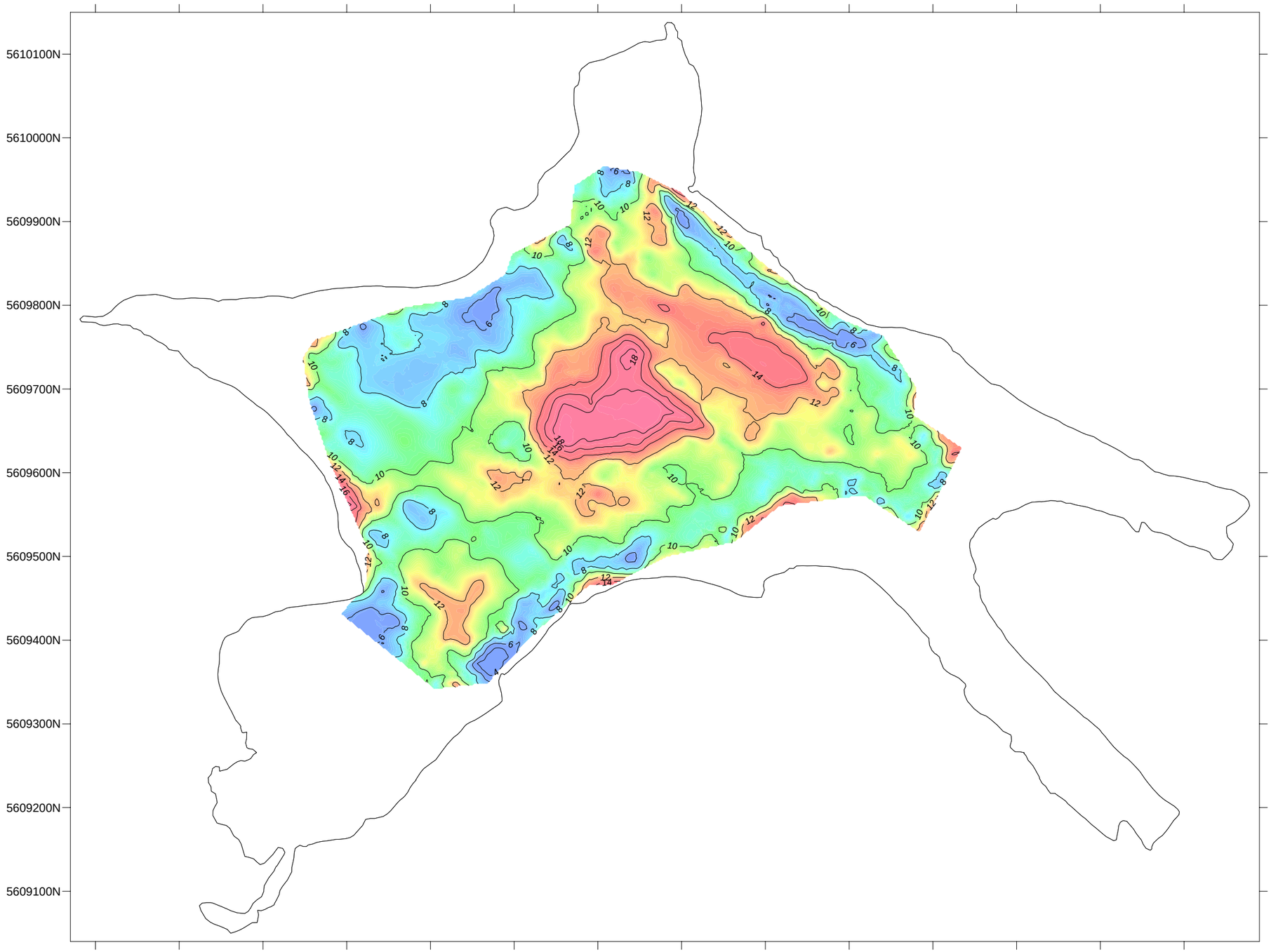
KGHM AJAX MINING INC.
JACKO LAKE, KAMLOOPS

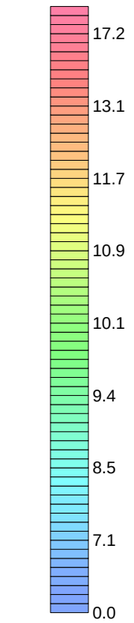
HYDROGRAPHIC SURVEY

SUB-BOTTOM BOUNDARY NO. 5 (INTERPRETED BEDROCK) CONTOUR PLAN

FRONTIER GEOSCIENCES INC.

DATE: SEPT. 2014	SCALE 1:5,000	FIG. 4





NOTES:

-CONTOUR INTERVAL: 2 METRE
-UTM NAD83 ZONE 10N HORIZONTAL DATUM
-WSC STAFF GAUGE LAKE LEVEL: 4.6 METRES

0 50 100 150 200

METRES

KGHM AJAX MINING INC.

JACKO LAKE, KAMLOOPS

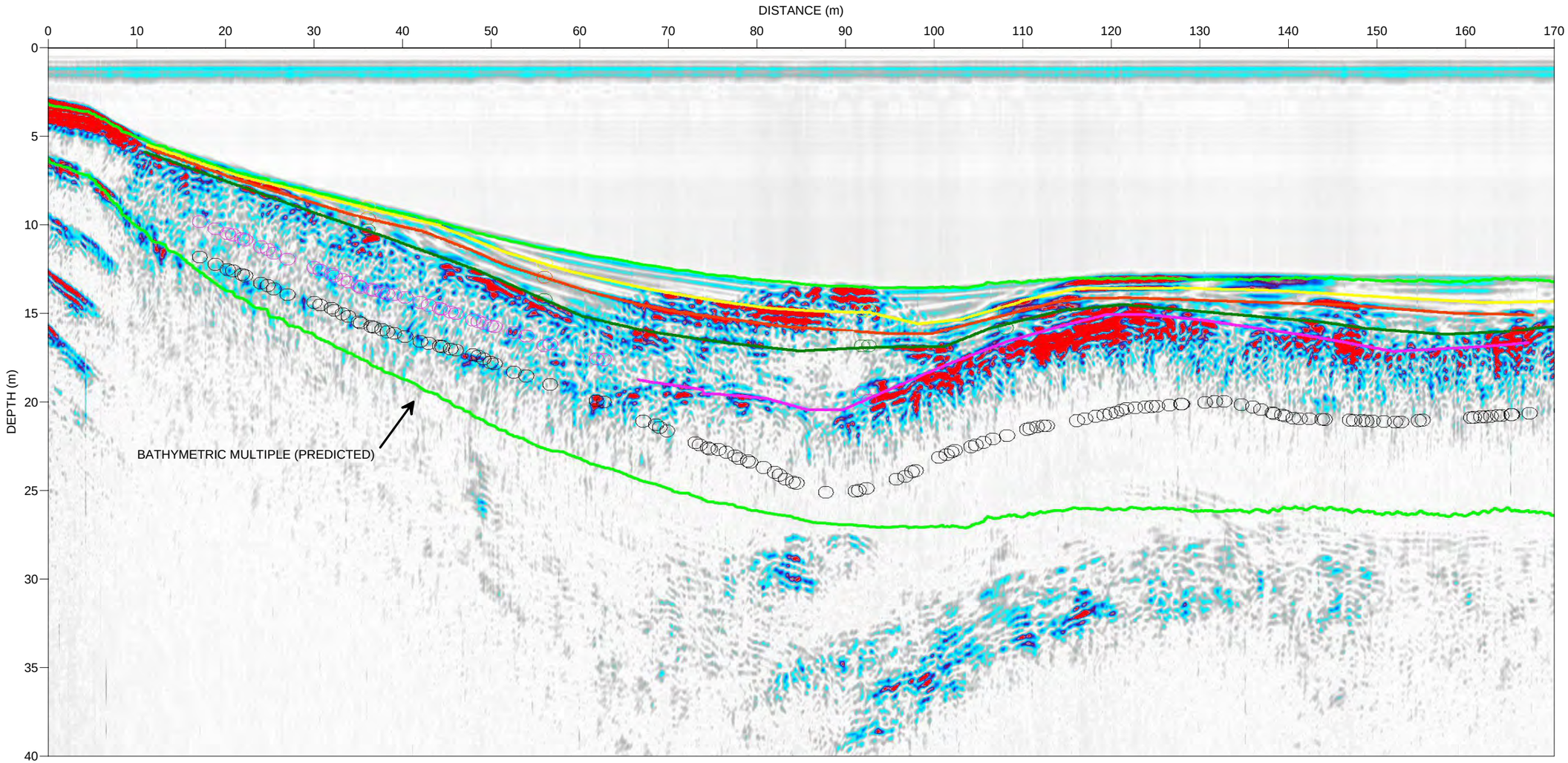
HYDROGRAPHIC SURVEY

TOTAL INTERPRETED SEDIMENTS ISOPACH PLAN

FRONTIER GEOSCIENCES INC.

DATE: SEPT. 2014	SCALE 1:5,000	FIG. 5

APPENDIX B



LEGEND:

- -BATHYMETRY (LAKE BOTTOM)
- -SUB-BOTTOM LAYER 1
- -SUB-BOTTOM LAYER 2
- -SUB-BOTTOM LAYER 3
- -SUB-BOTTOM LAYER 4
- -SUB-BOTTOM LAYER 4 (IDENTIFIED IN SEISMIC DATA)
- -SUB-BOTTOM LAYER 5 (IDENTIFIED IN SEISMIC DATA)

NOTES:

-EXAMPLE PROFILE LOCATION SHOWN ON FIGURE 2
-APPROXIMATE SCALES, 2:1 VERTICAL EXAGGERATION
-HORIZONTAL SCALE 1:500
-VERTICAL SCALE 1:250
-BATHYMETRIC MULTIPLE IS DUE TO ENERGY REVERBERATIONS IN THE WATER COLUMN, AND IS CALCULATED TO AID INTERPRETATION OF SUB-BOTTOM BOUNDARIES

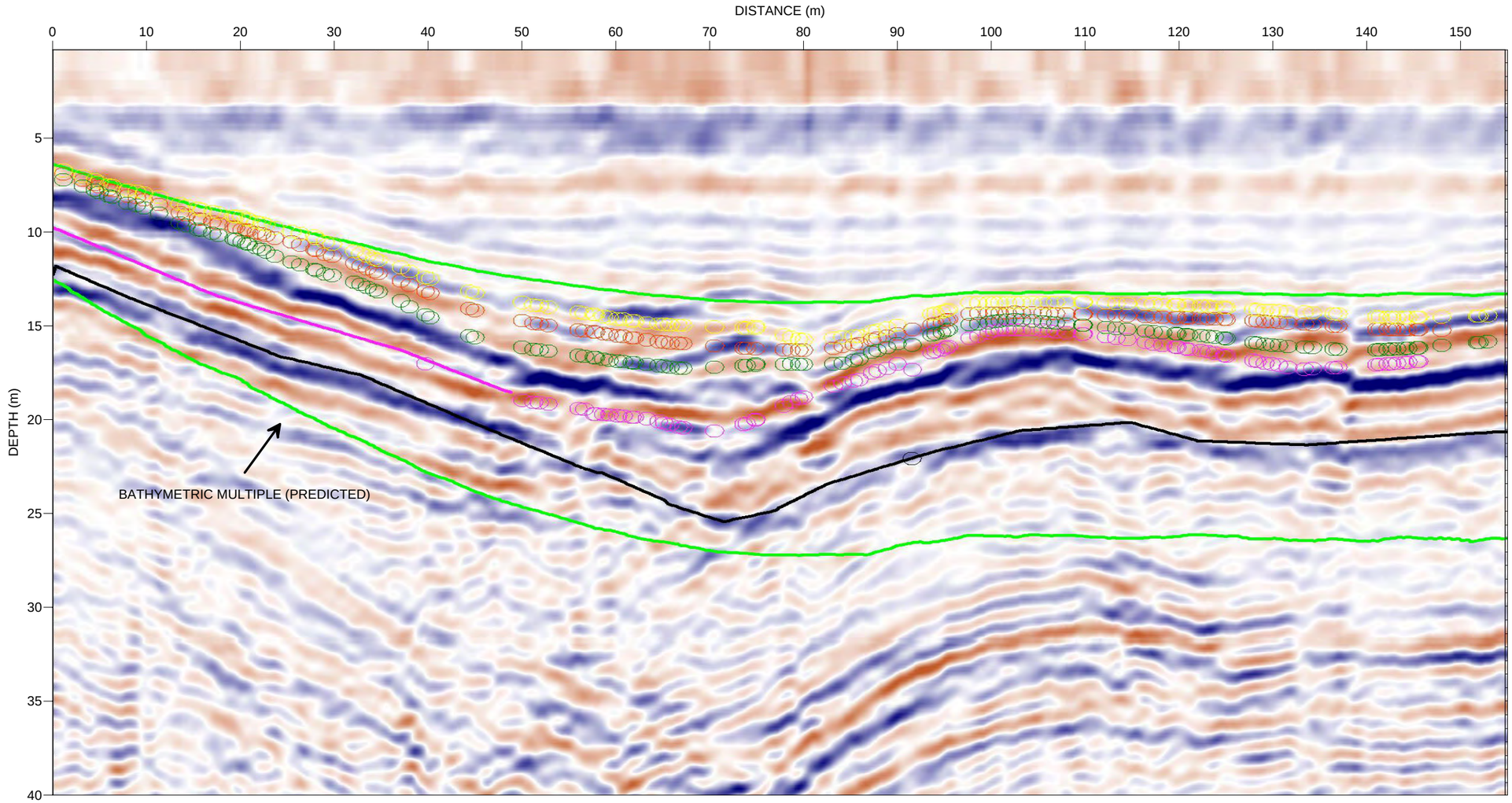
KGHM AJAX MINING INC.
JACKO LAKE, KAMLOOPS

HYDROGRAPHIC SURVEY

SUB-BOTTOM SONAR EXAMPLE PROFILE

FRONTIER GEOSCIENCES INC.

DATE: SEPT. 2014		FIG. 6



LEGEND:

- -BATHYMETRY (LAKE BOTTOM)
- -SUB-BOTTOM LAYER 1(IDENTIFIED IN SONAR DATA)
- -SUB-BOTTOM LAYER 2(IDENTIFIED IN SONAR DATA)
- -SUB-BOTTOM LAYER 3(IDENTIFIED IN SONAR DATA)
- -SUB-BOTTOM LAYER 4(IDENTIFIED IN SONAR DATA)
- -SUB-BOTTOM LAYER 4
- -SUB-BOTTOM LAYER 5 (BASAL)

NOTES:

-EXAMPLE PROFILE LOCATION SHOWN ON FIGURE 2
-APPROXIMATE SCALES, 2:1 VERTICAL EXAGGERATION
-HORIZONTAL SCALE 1:500
-VERTICAL SCALE 1:250
-BATHYMETRIC MULTIPLE IS DUE TO ENERGY REVERBERATIONS IN THE WATER COLUMN, AND IS CALCULATED TO AID INTERPRETATION OF SUB-BOTTOM BOUNDARIES

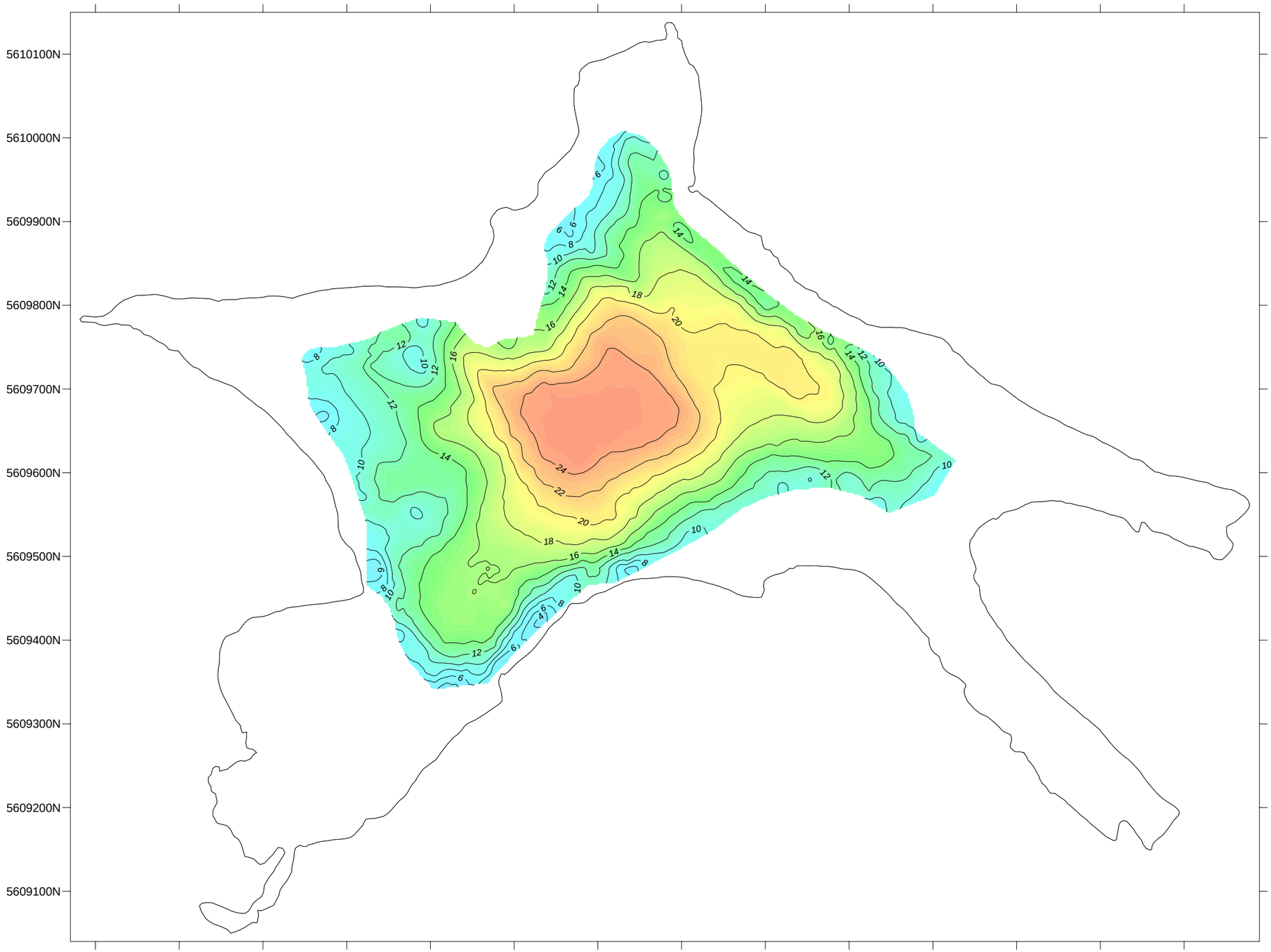
KGHM AJAX MINING INC.
JACKO LAKE, KAMLOOPS

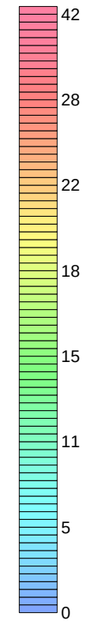
HYDROGRAPHIC SURVEY

SEISMIC ACOUSTIC PROFILING EXAMPLE PROFILE

FRONTIER GEOSCIENCES INC.

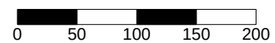
DATE: SEPT. 2014		FIG. 7





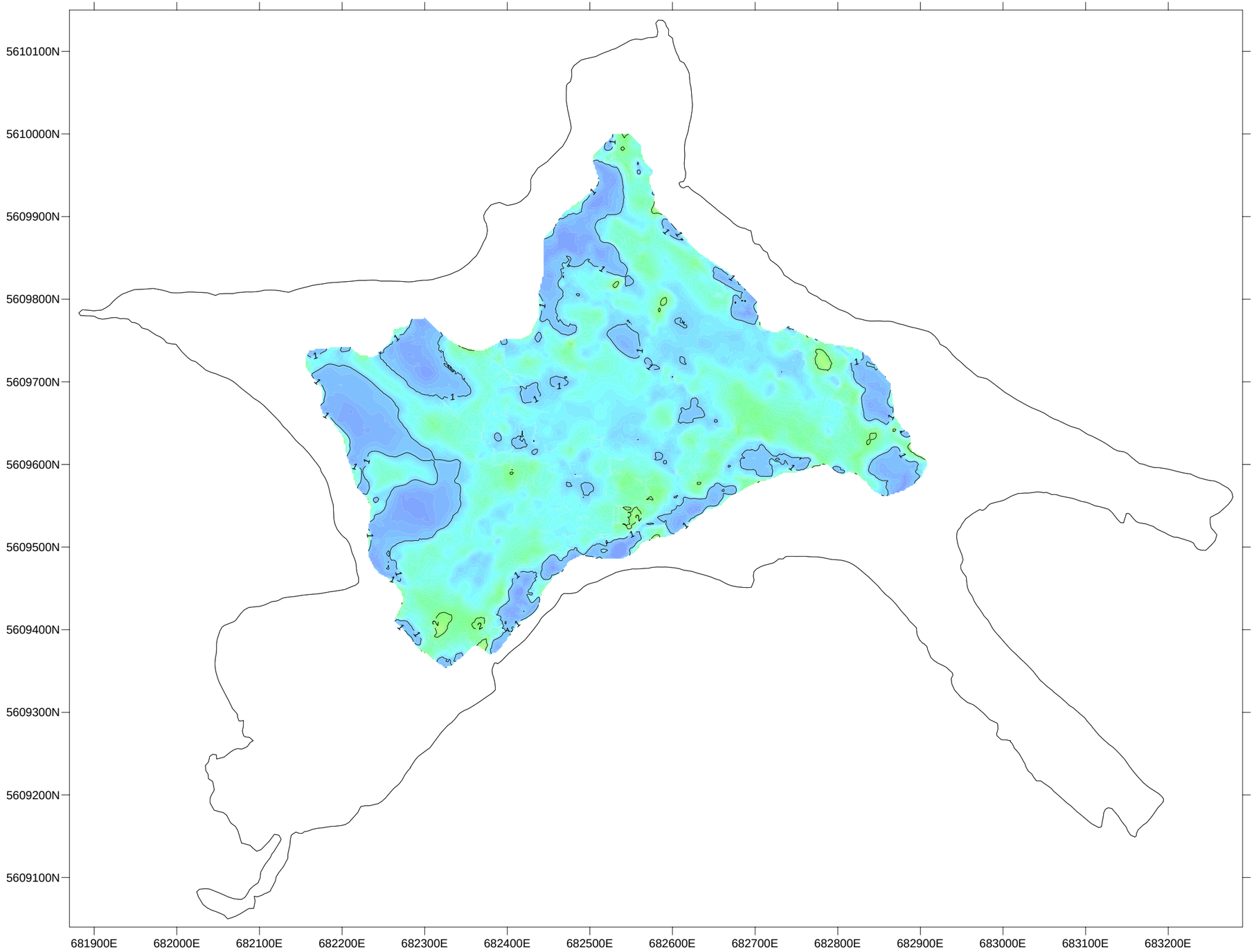
NOTES:

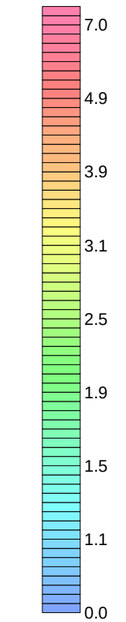
-CONTOUR INTERVAL: 2 METRE
-UTM NAD83 ZONE 10N HORIZONTAL DATUM
-WSC STAFF GAUGE LAKE LEVEL: 4.6 METRES



KGHM AJAX MINING INC. JACKO LAKE, KAMLOOPS
HYDROGRAPHIC SURVEY
SUB-BOTTOM BOUNDARY No. 1 CONTOUR PLAN
FRONTIER GEOSCIENCES INC.

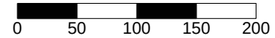
DATE: SEPT. 2014	SCALE 1:5,000	FIG. 8





NOTES:

-CONTOUR INTERVAL: 1 METRE
-UTM NAD83 ZONE 10N HORIZONTAL DATUM
-WSC STAFF GAUGE LAKE LEVEL: 4.6 METRES



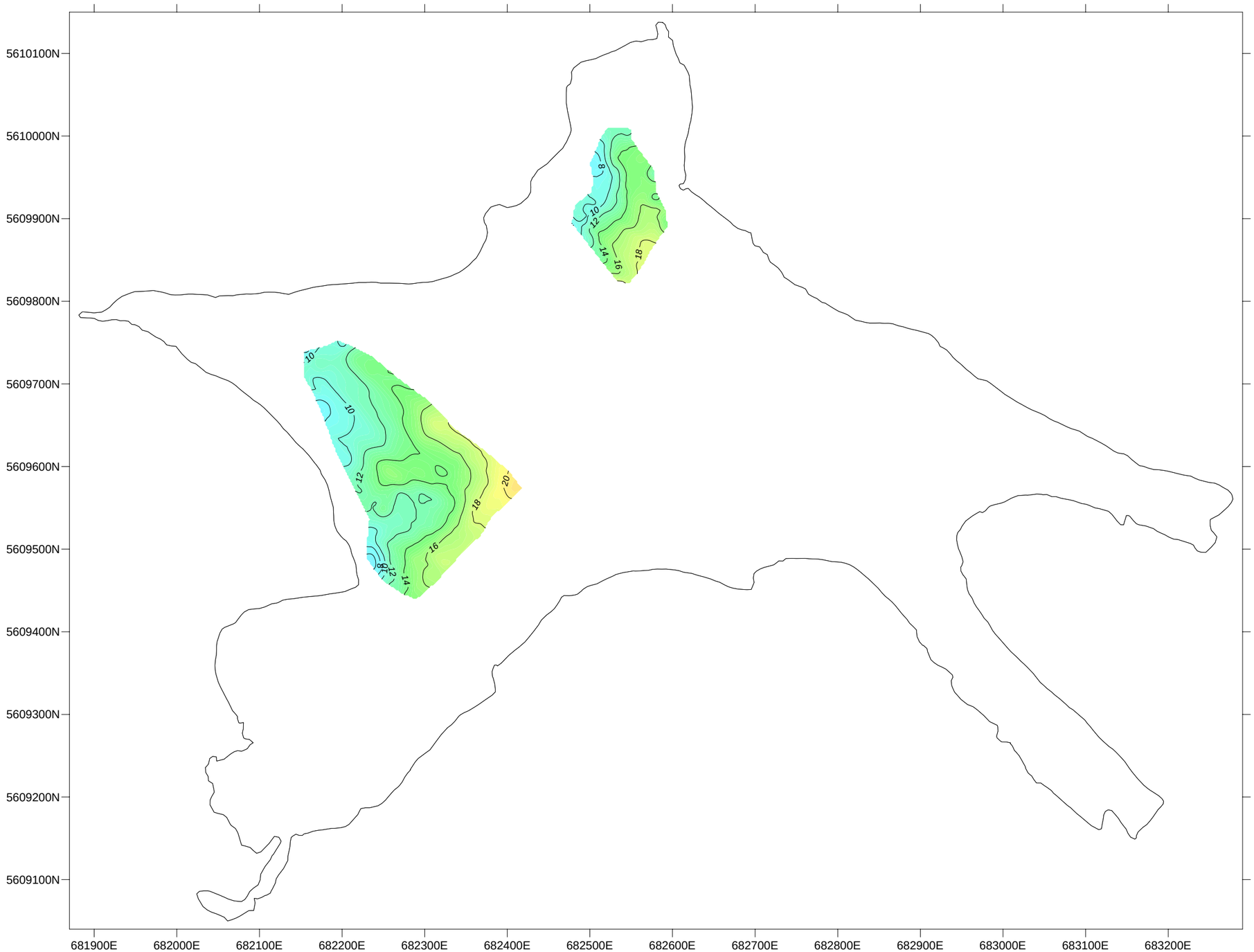
KGHM AJAX MINING INC.
JACKO LAKE, KAMLOOPS

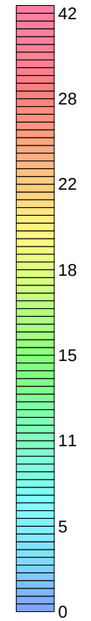
HYDROGRAPHIC SURVEY

SUB-BOTTOM LAYER No. 1 ISOPACH PLAN

FRONTIER GEOSCIENCES INC.

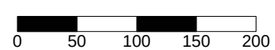
DATE: SEPT. 2014	SCALE 1:5,000	FIG. 9





NOTES:

-CONTOUR INTERVAL: 2 METRE
-UTM NAD83 ZONE 10N HORIZONTAL DATUM
-WSC STAFF GAUGE LAKE LEVEL: 4.6 METRES



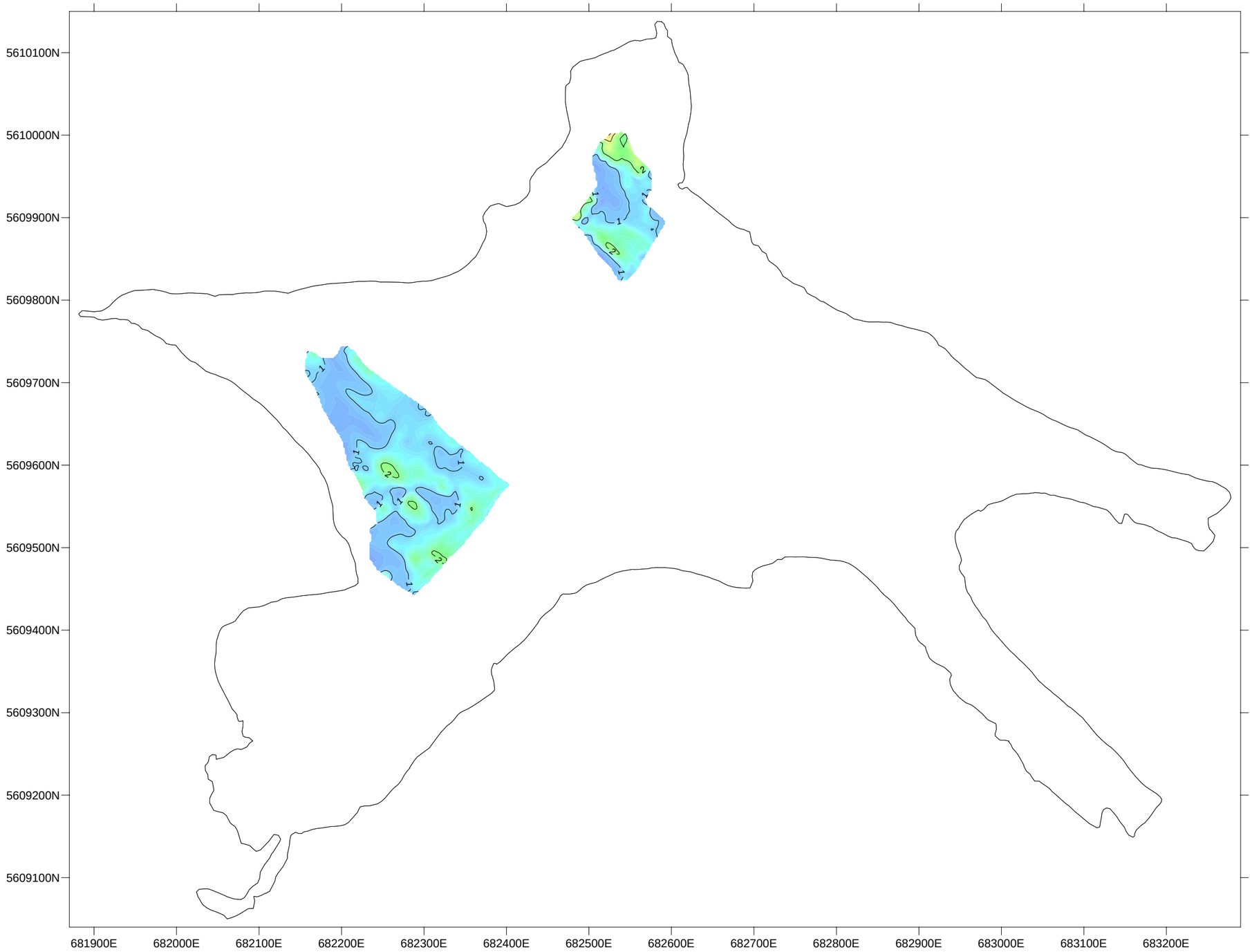
KGHM AJAX MINING INC.
JACKO LAKE, KAMLOOPS

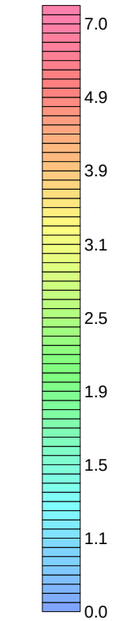
HYDROGRAPHIC SURVEY

SUB-BOTTOM BOUNDARY No. 2 CONTOUR PLAN

FRONTIER GEOSCIENCES INC.

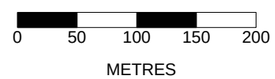
DATE: SEPT. 2014	SCALE 1:5,000	FIG. 10





NOTES:

-CONTOUR INTERVAL: 1 METRE
-UTM NAD83 ZONE 10N HORIZONTAL DATUM
-WSC STAFF GAUGE LAKE LEVEL: 4.6 METRES



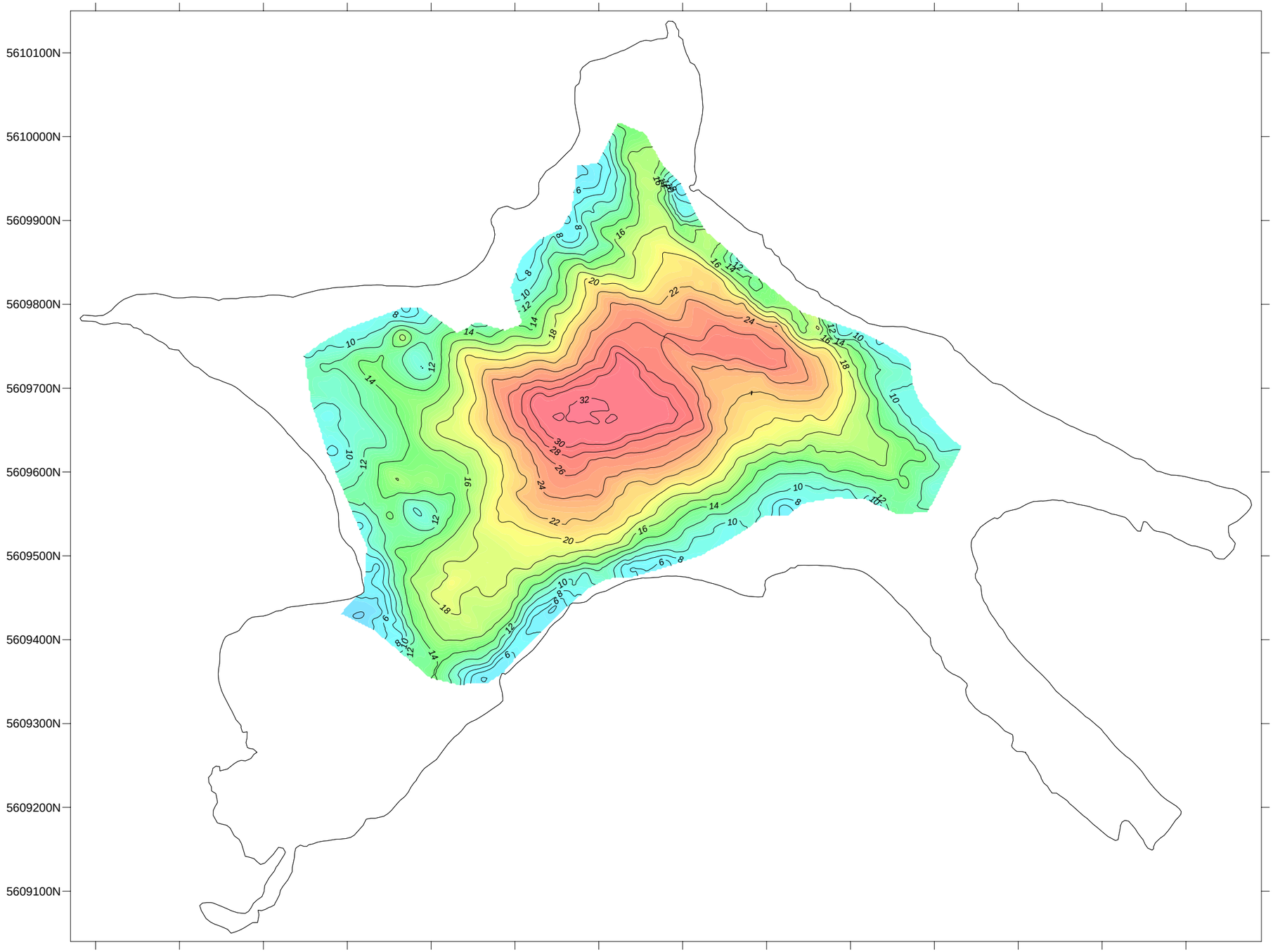
KGHM AJAX MINING INC.
JACKO LAKE, KAMLOOPS

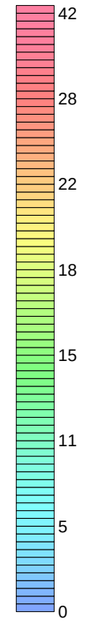
HYDROGRAPHIC SURVEY

SUB-BOTTOM LAYER No. 2 ISOPACH PLAN

FRONTIER GEOSCIENCES INC.

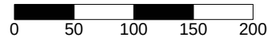
DATE: SEPT. 2014	SCALE 1:5,000	FIG. 11





NOTES:

-CONTOUR INTERVAL: 2 METRE
-UTM NAD83 ZONE 10N HORIZONTAL DATUM
-WSC STAFF GAUGE LAKE LEVEL: 4.6 METRES



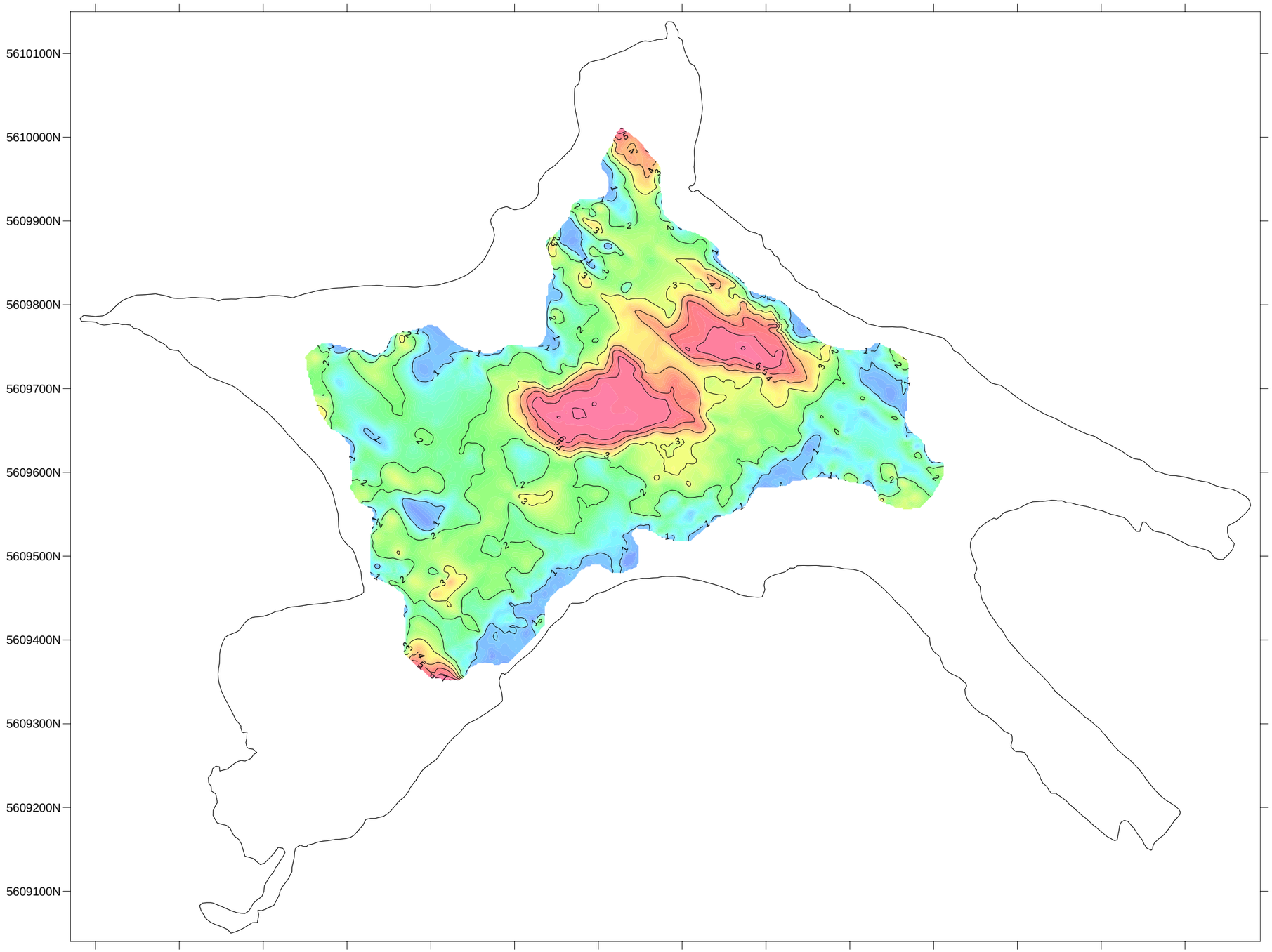
KGHM AJAX MINING INC.
JACKO LAKE, KAMLOOPS

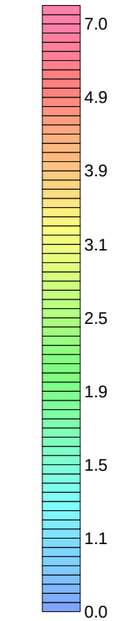
HYDROGRAPHIC SURVEY

SUB-BOTTOM BOUNDARY No. 3 CONTOUR PLAN

FRONTIER GEOSCIENCES INC.

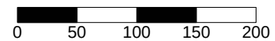
DATE: SEPT. 2014	SCALE 1:5,000	FIG. 12





NOTES:

-CONTOUR INTERVAL: 1 METRE
-UTM NAD83 ZONE 10N HORIZONTAL DATUM
-WSC STAFF GAUGE LAKE LEVEL: 4.6 METRES



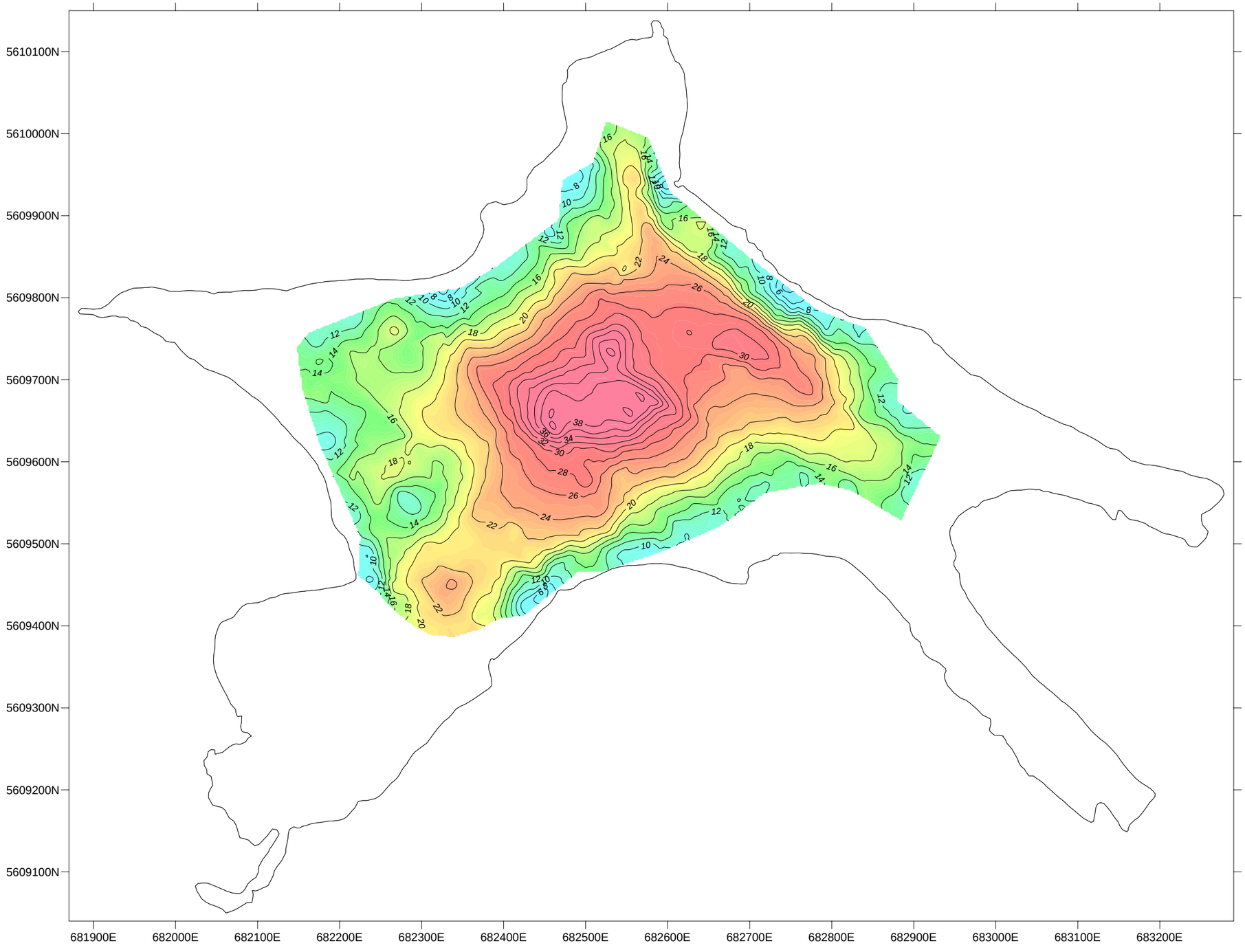
KGHM AJAX MINING INC.
JACKO LAKE, KAMLOOPS

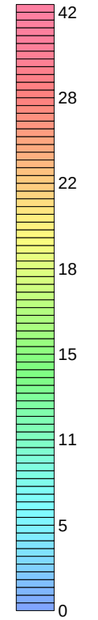
HYDROGRAPHIC SURVEY

SUB-BOTTOM LAYER No. 3 ISOPACH PLAN

FRONTIER GEOSCIENCES INC.

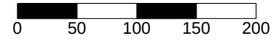
DATE: SEPT. 2014	SCALE 1:5,000	FIG. 13





NOTES:

-CONTOUR INTERVAL: 2 METRE
-UTM NAD83 ZONE 10N HORIZONTAL DATUM
-WSC STAFF GAUGE LAKE LEVEL: 4.6 METRES



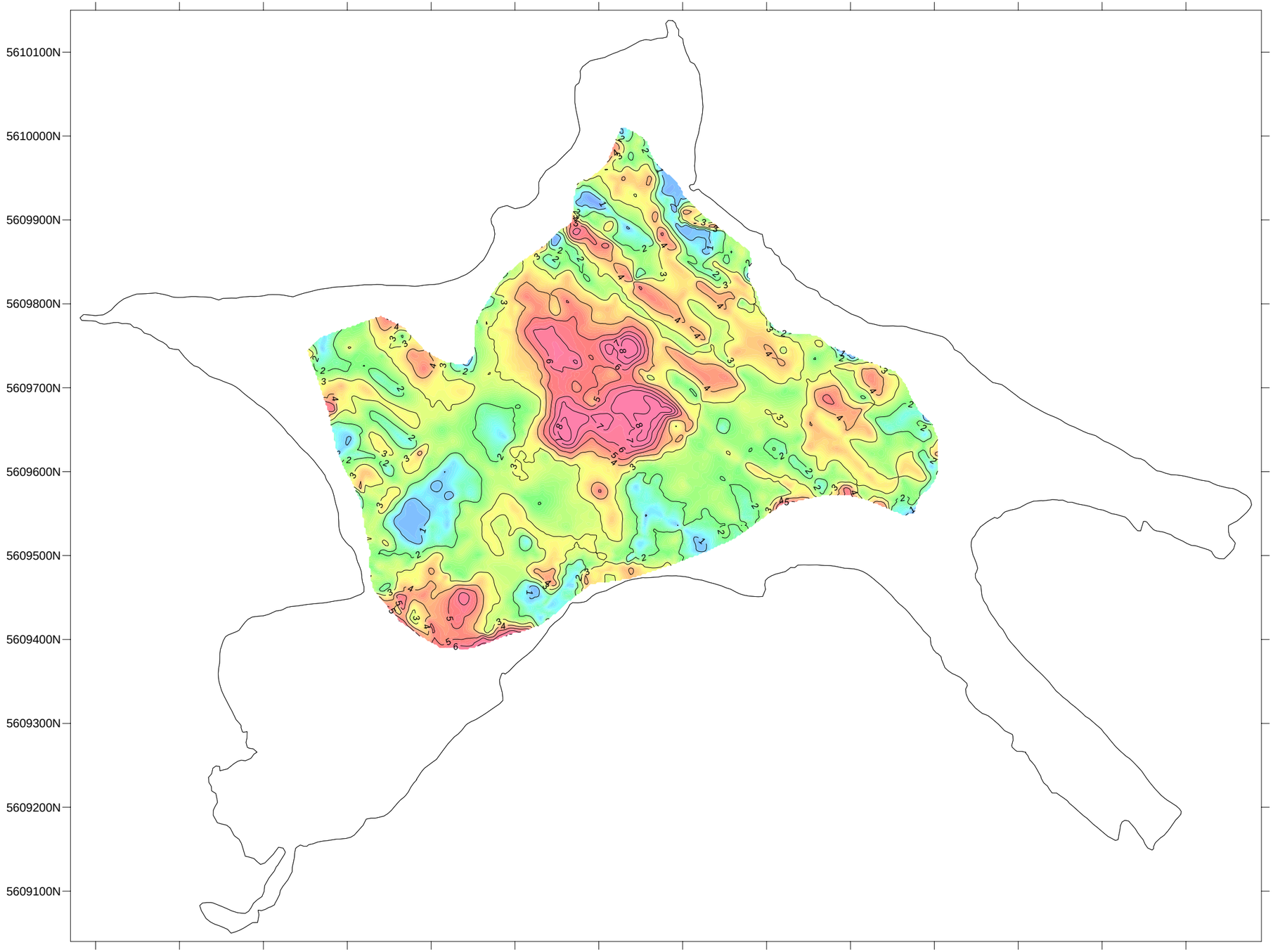
KGHM AJAX MINING INC.
JACKO LAKE, KAMLOOPS

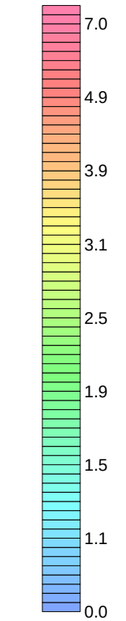
HYDROGRAPHIC SURVEY

SUB-BOTTOM BOUNDARY No. 4 CONTOUR PLAN

FRONTIER GEOSCIENCES INC.

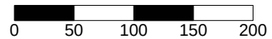
DATE: SEPT. 2014	SCALE 1:5,000	FIG. 14





NOTES:

-CONTOUR INTERVAL: 1 METRE
-UTM NAD83 ZONE 10N HORIZONTAL DATUM
-WSC STAFF GAUGE LAKE LEVEL: 4.6 METRES



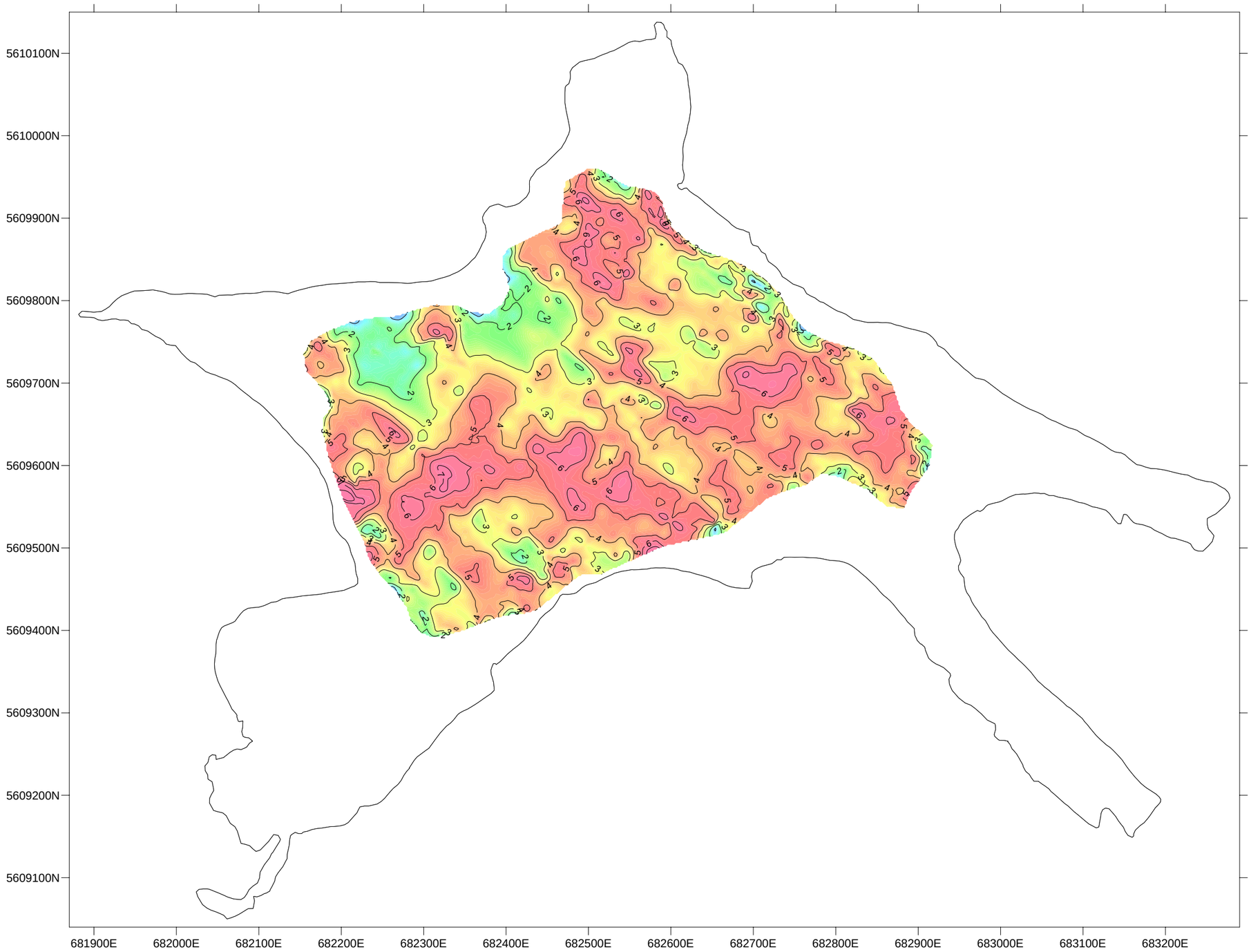
KGHM AJAX MINING INC.
JACKO LAKE, KAMLOOPS

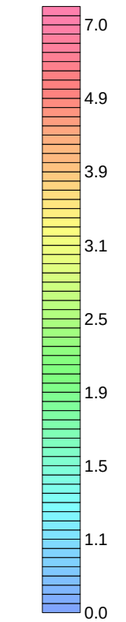
HYDROGRAPHIC SURVEY

SUB-BOTTOM LAYER No. 4 ISOPACH PLAN

FRONTIER GEOSCIENCES INC.

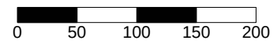
DATE: SEPT. 2014	SCALE 1:5,000	FIG. 15





NOTES:

-CONTOUR INTERVAL: 1 METRE
-UTM NAD83 ZONE 10N HORIZONTAL DATUM
-WSC STAFF GAUGE LAKE LEVEL: 4.6 METRES



KGHM AJAX MINING INC.
JACKO LAKE, KAMLOOPS

HYDROGRAPHIC SURVEY

SUB-BOTTOM LAYER No. 5 (INTERPRETED TILL THICKNESS) ISOPACH PLAN

FRONTIER GEOSCIENCES INC.

DATE: SEPT. 2014	SCALE 1:5,000	FIG. 16

HAND AUGER LOG KCB14-HA1

STARTED: Aug 19, 2014 **FINISHED:** Aug 19, 2014
METHOD: Hand Auger
GROUND ELEV. (m): 893.9
COORDINATES (m): N 682973 E 5609547

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE AND NO.	CORE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
					0.1 / 893.8 ORGANIC SILT (OL), trace medium gravel (sub-angular), dark brown, moist, abundant roots and rootlets throughout (matted), gradual change to	
					0.4 / 893.6 SILT (ML), clayey, trace fine to medium gravel (sub-rounded to sub-angular), dark brown, moist, trace roots, gradual change to	
					0.7 / 893.3 CLAY (CL), silty, gravelly (fine to medium, sub-rounded to sub-angular), low plasticity, brown to grey, moist to wet, gradual change to	
					0.8 / 893.1 GRAVEL (GC), fine to coarse, clayey (low plasticity), (sub-angular to rounded), brown to grey, wet	
1					End of Test Pit at 0.8 m.	
2						

Su - kPa
25 75 125 175 225
UC/2 P.PEN/2
WATER1 WATER2 WATER3
% FINES SPT N LPT N
W_P% W% W_L%
20 40 60 80

PROJECT NO.: M09871A01
PROJECT: Ajax Mine Groundwater Study
LOCATION: Jacko Lake
LOGGED BY: AH **CHECKED BY:** MC
SHEET 1 **OF** 1 **HOLE NO.:** KCB14-HA1

Klohn Crippen Berger

KCBL_HAND_AUGER-SI 140624 AJAX OVERBURDEN_ES.GPJ KC_DATA.GDT 3/11/15

HAND AUGER LOG KCB14-HA2

STARTED: Aug 22, 2014 **FINISHED:** Aug 22, 2014
METHOD: Hand Auger
GROUND ELEV. (m): 894.3
COORDINATES (m): N 682990 E 5609557

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE AND NO.	CORE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
					ORGANIC SILT (OL), trace fine to coarse gravel, dark brown, moist, roots and rootlets throughout, gradual change to	
					0.2 894.2 CLAY (CI), silty, gravel throughout (angular-sub-rounded fine to medium), medium plasticity, brown, moist, occasional roots and rootlets, gradual change to	
					0.4 893.9 CLAY (CL), gravelly, silty, fine to coarse gravel (angular to sub-rounded), low plasticity, brown-grey, moist to wet	
					0.7 893.7 CLAY (CL), sandy, silty, abundant gravel (fine to coarse, sub-angular to rounded), low plasticity, wet	
					0.7 893.6 End of Test Pit at 0.7 m.	
1						
2						

Su - kPa
25 75 125 175 225
◆ UC/2 ▲ P.PEN/2
WATER1 ▽ WATER2 ▼ WATER3 ▼
★ % FINES ■ SPT N ◘ LPT N
W_P% W% W_L%
× – – – – ▲ – – – – ×
20 40 60 80

Klohn Crippen Berger

PROJECT NO.: M09871A01
PROJECT: Ajax Mine Groundwater Study
LOCATION: Jacko Lake
LOGGED BY: AH **CHECKED BY:** MC
SHEET 1 **OF** 1 **HOLE NO.:** KCB14-HA2

KCBL_HAND_AUGER-SI 140624 AJAX OVERBURDEN_ES.GPJ KC_DATA.GDT 3/11/15

HAND AUGER LOG KCB14-HA3

STARTED: Aug 20, 2014 **FINISHED:** Aug 20, 2014
METHOD: Hand Auger
GROUND ELEV. (m): 889.6
COORDINATES (m): N 682967 E 5609542

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE AND NO.	CORE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
					0.1 889.5 ORGANIC SILT (OL), with sub-angular to angular gravel (up to 20 mm diameter), dark brown, moist, roots and rootlets throughout, gradual change to CLAY (CL), silty, fine to coarse gravel throughout (rounded to angular), low plasticity, grey to brown, moist, occasional roots, some mottling, gradual change to	
					0.4 889.2 CLAY (CL), gravelly (fine to coarse, rounded to angular, up to 20 mm diameter), silty, with fine sand, low plasticity, brown to grey, wet	
1					0.5 889.1 End of Test Pit at 0.5 m.	
2						

Su - kPa
25 75 125 175 225
◆ UC/2 ▲ P.PEN/2
WATER1 ▽ WATER2 ▼ WATER3 ▼
★ % FINES ■ SPT N ◘ LPT N
W_P% W% W_L%
× – – – – ▲ – – – – ×
20 40 60 80

Klohn Crippen Berger

PROJECT NO.: M09871A01
PROJECT: Ajax Mine Groundwater Study
LOCATION: Jacko Lake
LOGGED BY: AH **CHECKED BY:** MC
SHEET 1 **OF** 1 **HOLE NO.:** KCB14-HA3

KCBL_HAND_AUGER-SI 140624 AJAX OVERBURDEN_ES.GPJ KC_DATA.GDT 3/11/15

HAND AUGER LOG KCB14-HA4

STARTED: Aug 22, 2014 **FINISHED:** Aug 22, 2014
METHOD: Hand Auger
GROUND ELEV. (m): 891.0
COORDINATES (m): N 682997 E 5609561

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE AND NO.	CORE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
					ORGANIC SILT (OL), trace fine gravel (angular-sub-angular), dark brown, dry to moist, roots and rootlets throughout	
0.3 / 890.8					SILT (ML), clayey, abundant gravel throughout (angular to sub-rounded), medium plasticity, medium stiff, brown, dry to moist, gradual change to	
0.5 / 890.6					CLAY (CL), silty, gravelly (fine to coarse, angular to rounded), with silt (possibly from disturbance of material), low plasticity, grey (brown due to water), wet	
0.6 / 890.4					End of Test Pit at 0.6 m.	
1						
2						

Su - kPa
25 75 125 175 225
UC/2 P.PEN/2
WATER1 WATER2 WATER3
% FINES SPT N LPT N
W_P% W% W_L%
20 40 60 80

Klohn Crippen Berger

PROJECT NO.: M09871A01
PROJECT: Ajax Mine Groundwater Study
LOCATION: Jacko Lake
LOGGED BY: AH **CHECKED BY:** MC
SHEET 1 **OF** 1 **HOLE NO.:** KCB14-HA4

KCBL_HAND_AUGER-SI 140624 AJAX OVERBURDEN_ES.GPJ KC_DATA.GDT 3/11/15

HAND AUGER LOG KCB14-HA5

STARTED: Aug 21, 2014 **FINISHED:** Aug 21, 2014
METHOD: Hand Auger
GROUND ELEV. (m): 888.1
COORDINATES (m): N 682951 E 5609530

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE AND NO.	CORE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
					SILT (ML), clayey, occasional fine to coarse gravel (angular to sub-rounded), medium stiff, dark brown, moist, abundant roots and rootlets throughout, gradual change to	
					0.2 888.0 CLAY (CL), gravelly (fine to coarse gravel throughout, angular to sub-rounded), silty, low plasticity, brown-grey, moist from 0.15 to 0.22 m, moist to wet from 0.22 to 0.4 m	
					0.4 887.7 End of Test Pit at 0.4 m.	
1						
2						

Su - kPa
25 75 125 175 225
◆ UC/2 ▲ P.PEN/2
WATER1 ▽ WATER2 ▼ WATER3 ▼
★ % FINES ■ SPT N ◘ LPT N
W_P% W% W_L%
× – – – – ▲ – – – – ×
20 40 60 80

Klohn Crippen Berger

PROJECT NO.: M09871A01
PROJECT: Ajax Mine Groundwater Study
LOCATION: Jacko Lake
LOGGED BY: AH **CHECKED BY:** MC
SHEET 1 **OF** 1 **HOLE NO.:** KCB14-HA5

KCBL_HAND_AUGER-SI 140624 AJAX OVERBURDEN_ES.GPJ KC_DATA.GDT 3/11/15

HAND AUGER LOG KCB14-HA6

STARTED: Aug 22, 2014 **FINISHED:** Aug 22, 2014
METHOD: Hand Auger
GROUND ELEV. (m): 890.3
COORDINATES (m): N 683007 E 5609565

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE AND NO.	CORE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
					ORGANIC SILT (OL), clayey, fine to coarse gravel (angular to rounded), dark brown, moist, roots and rootlets throughout, gradual change to	
					0.4 / 890.0 CLAY (CL), gravelly (fine to coarse, sub-angular to rounded), occasional cobbles up to 20 mm diameter, low plasticity, grey, moist to wet (below WT, core material moist to wet)	
					0.5 / 889.8 End of Test Pit at 0.5 m.	
1						
2						

Su - kPa
25 75 125 175 225
UC/2 P.PEN/2
WATER1 WATER2 WATER3
% FINES SPT N LPT N
W_P% W% W_L%
20 40 60 80

Klohn Crippen Berger

PROJECT NO.: M09871A01
PROJECT: Ajax Mine Groundwater Study
LOCATION: Jacko Lake
LOGGED BY: AH **CHECKED BY:** MC
SHEET 1 **OF** 1 **HOLE NO.:** KCB14-HA6

KCBL_HAND_AUGER-SI 140624 AJAX OVERBURDEN_ES.GPJ KC_DATA.GDT 3/11/15

HAND AUGER LOG KCB14-HA7

STARTED: Aug 22, 2014 **FINISHED:** Aug 22, 2014
METHOD: Hand Auger
GROUND ELEV. (m): 885.7
COORDINATES (m): N 682943 E 5609517

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE AND NO.	CORE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
					ORGANIC SILT (OL), clayey, trace fine to medium gravel (sub-rounded to sub-angular), dark brown, moist, abundant roots and rootlets throughout, gradual change to	
					0.1 / 885.6	
					CLAY (CL), gravelly (fine to coarse gravel, sub-angular to rounded, single cobble is sub-angular, 40 mm diameter), silty, low plasticity, grey-brown, moist-wet, with rootlets throughout, gradual change to	
					0.2 / 885.5	
					CLAY (CL), gravelly (fine to coarse gravel, angular to sub-rounded), low plasticity, density increases with depth, moist to wet, brown-grey, occasional rootlets to 0.25 m, seepage at ~0.5 m however inner sample from auger is moist only	
					0.6 / 885.1	
					End of Test Pit at 0.6 m.	
1						
2						

Su - kPa
25 75 125 175 225
◆ UC/2 ▲ P.PEN/2
WATER1 ▽ WATER2 ▼ WATER3 ▼
★ % FINES ■ SPT N ◘ LPT N
W_P% W% W_L%
× – – – – ▲ – – – – ×
20 40 60 80

Klohn Crippen Berger

PROJECT NO.: M09871A01
PROJECT: Ajax Mine Groundwater Study
LOCATION: Jacko Lake
LOGGED BY: AH **CHECKED BY:** MC
SHEET 1 **OF** 1 **HOLE NO.:** KCB14-HA7

KCBL_HAND_AUGER-SI 140624 AJAX OVERBURDEN_ES.GPJ KC_DATA.GDT 3/11/15

HAND AUGER LOG KCB14-HA8

STARTED: Aug 22, 2014 **FINISHED:** Aug 22, 2014
METHOD: Hand Auger
GROUND ELEV. (m): 894.6
COORDINATES (m): N 682945 E 5609501

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE AND NO.	CORE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
					SILT (ML), trace fine angular gravel, dark brown, moist, abundant roots and rootlets, gradual change	
					0.3 894.3 SILT (ML), clayey, trace fine to coarse gravel and medium sand, grey to brown, moist, moist to wet from 0.4 m, trace rootlets	
					0.5 894.1 CLAY (CL-CI), gravelly (fine to coarse, sub-angular to rounded), medium sand throughout, brown to grey, low to medium plasticity, wet	
1					0.7 894.0 End of Test Pit at 0.7 m.	
2						

Su - kPa
25 75 125 175 225
◆ UC/2 ▲ P.PEN/2
WATER1 ▽ WATER2 ▼ WATER3 ▼
★ % FINES ■ SPT N ◘ LPT N
W_P% W% W_L%
× – – – – ▲ – – – – ×
20 40 60 80

Klohn Crippen Berger

PROJECT NO.: M09871A01
PROJECT: Ajax Mine Groundwater Study
LOCATION: Jacko Lake
LOGGED BY: AH **CHECKED BY:** MC
SHEET 1 **OF** 1 **HOLE NO.:** KCB14-HA8

KCBL_HAND_AUGER-SI 140624 AJAX OVERBURDEN_ES.GPJ KC_DATA.GDT 3/11/15

TEST PIT LOG TP-1

STARTED: Aug 21, 2014 **FINISHED:** Aug 21, 2014
METHOD: Excavator
GROUND ELEV. (m): 887.2
COORDINATES (m): N 683144 E 5609624

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE AND NO.	CORE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
					0.2 / 887.1 ORGANIC SILT (OL), with abundant gravel (angular-sub-rounded), occasional cobbles up to 100 mm diameter, loose to moderate density, dark brown, dry to moist, pocket penetrometer 1 to 3 kg/cm², abundant roots and rootlets throughout, gradual change to	
					GRAVEL (GC), fine to coarse, some sand, some silt or clay, some cobbles/boulders, well graded, maximum particle size 600 mm, flat, sub-angular, brown-grey, no odour, dry to moist, pocket penetrometer 1.5 to 3.5 kg/cm², weak cementation, strong reaction to HCl, trace roots	
1		1				
					1.7 / 885.5 Bedrock, weathered, dark grey, fractured deep joints, altered volcanics	
2		2				
					2.1 / 885.1 End of Test Pit at 2.1 m.	
3						
4						
5						

Su - kPa
25 75 125 175 225
UC/2 P.PEN/2
WATER1 WATER2 WATER3
% FINES SPT N LPT N
W_P% W% W_L%
20 40 60 80

Klohn Crippen Berger

PROJECT NO.: M09871A01
PROJECT: Ajax Mine Groundwater Study
LOCATION: Jacko Lake
LOGGED BY: AH **CHECKED BY:** MC
SHEET 1 **OF** 1 **HOLE NO.:** TP-1

KCBL_TEST_PITS-SI 140624 AJAX OVERBURDEN_ES.GPJ KC_DATA.GDT 3/11/15

TEST PIT LOG TP-2

STARTED: Aug 21, 2014 **FINISHED:** Aug 21, 2014
METHOD: Excavator
GROUND ELEV. (m): 892.9
COORDINATES (m): N 683152 E 5609624

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE AND NO.	CORE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
					CLAY (CL), silty, trace fine to coarse gravel and small cobbles throughout (sub-rounded fine to coarse sub-angular and up to 150 mm diameter), loose, dark brown, dry to moist, low plasticity, pocket penetrometer 1 to 2 kg/cm², partially matted by roots, abundant roots and rootlets throughout	
0.4					892.5	
					GRAVEL (GC), fine to coarse, sandy, some silt or clay, poorly graded, density increases with depth, maximum particle size 200 mm, flat, sub-angular, grey-brown, no odour, dry to moist, pocket penetrometer 1.5 to 2.25 kg/cm², weak cementation, strong reaction to HCl	
1						
		1				
2.0					890.9	
2					End of Test Pit at 2.0 m.	
3						
4						
5						

Su - kPa
25 75 125 175 225
UC/2 P.PEN/2
WATER1 WATER2 WATER3
% FINES SPT N LPT N
W_P% W% W_L%
20 40 60 80

PROJECT NO.: M09871A01
PROJECT: Ajax Mine Groundwater Study
LOCATION: Jacko Lake
LOGGED BY: AH **CHECKED BY: MC**
SHEET 1 **OF** 1 **HOLE NO.:** TP-2

Klohn Crippen Berger

KCBL_TEST_PITS-SI 140624 AJAX OVERBURDEN_ES.GPJ KC_DATA.GDT 3/11/15

TEST PIT LOG TP-A

STARTED: Aug 20, 2014 **FINISHED:** Aug 20, 2014
METHOD: Excavator
GROUND ELEV. (m): 893.9
COORDINATES (m): N 682996 E 5609543

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE AND NO.	CORE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
					SILT (ML), clayey, sub-angular to sub-rounded gravel (1 to 10mm diameter), low plasticity, stiff, dark brown, moist, pocket penetrometer 1 to 1.15 kg/cm², abundant roots and rootlets throughout gradual change to	
					0.3 / 893.7	
					0.4 / 893.5 SAND (SC), fine to coarse, gravelly, clayey, poorly graded, maximum particle size 66 mm, flat, sub-angular, dark brown, no odor, moist, weak cementation, weak reaction to HCl, some roots, pocket penetrometer 1 to 2 kg/cm², gradual change to	
		1				
					GRAVEL (GC), fine to coarse, some sand to sandy, poorly graded becomes well graded at 3.1 m, moderate in-situ density, maximum particle size 200 mm, sub-angular to sub-rounded, brown-grey, no odour, moist, pocket penetrometer 1.25 to 2.5 kg/cm², weak to moderate cementation, weak reaction to HCl, some roots to 0.9 m	
1		2				
2						
		3				
3					3.1 / 890.8	
					End of Test Pit at 3.1 m.	
4						
5						

Su - kPa
25 75 125 175 225
UC/2 P.PEN/2
WATER1 WATER2 WATER3
% FINES SPT N LPT N
W_P% W% W_L%
20 40 60 80

PROJECT NO.: M09871A01
PROJECT: Ajax Mine Groundwater Study
LOCATION: Jacko Lake
LOGGED BY: AH **CHECKED BY: MC**
SHEET 1 **OF** 1 **HOLE NO.:** TP-A

Klohn Crippen Berger

KCBL_TEST_PITS-SI 140624 AJAX OVERBURDEN_ES.GPJ KC_DATA.GDT 3/11/15

TEST PIT LOG TP-B

STARTED: Aug 20, 2014 **FINISHED:** Aug 20, 2014
METHOD: Excavator
GROUND ELEV. (m): 888.9
COORDINATES (m): N 682969 E 5609543

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE AND NO.	CORE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
					ORGANIC SILT (OL), clayey, trace fine angular to sub-rounded gravel, low plasticity, stiff, dark brown, moist, pocket penetrometer 1.5 to 2 kg/cm², roots and rootlets throughout, gradual change to	
					0.3 / 888.6	
					GRAVEL and SAND (GC), fine to coarse, some silt or clay, some cobbles, poorly graded, maximum particle size 200 mm, flat and elongated, sub-angular to sub-rounded, grey to brown, no odour, moist, pocket penetrometer 1.0 to 2.25 kg/cm² from 0 to 0.5 m, becoming consolidated at 0.5 m, moderate to strong cementation, strong reaction to HCl, some roots to 0.6 m	
1		1				
2						
3						
4		2				
					4.2 / 884.7	
					End of Test Pit at 4.2 m.	
5						

Su - kPa
25 75 125 175 225
◆ UC/2 ▲ P.PEN/2
WATER1 ▽ WATER2 ▼ WATER3 ▼
★ % FINES ■ SPT N ◘ LPT N
W_P% W% W_L%
× – – – – ▲ – – – – ×
20 40 60 80

Klohn Crippen Berger

PROJECT NO.: M09871A01
PROJECT: Ajax Mine Groundwater Study
LOCATION: Jacko Lake
LOGGED BY: AH **CHECKED BY:** MC
SHEET 1 **OF** 1 **HOLE NO.:** TP-B

KCBL_TEST_PITS-SI 140624 AJAX OVERBURDEN_ES.GPJ KC_DATA.GDT 3/11/15

TEST PIT LOG TP-C

STARTED: Aug 20, 2014 **FINISHED:** Aug 20, 2014
METHOD: Excavator
GROUND ELEV. (m): 887.9
COORDINATES (m): N 682962 E 5609526

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE AND NO.	CORE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
					0.2 / 887.7 ORGANIC SILT (OL), clayey, trace fine to medium gravel (sub-angular), dark brown, dry to moist, pocket penetrometer 0.5 to 1.5 kg/cm², roots and rootlets throughout, gradual change to	
					0.3 / 887.6 CLAY (CI), silty, abundant gravel and cobbles throughout (angular to rounded), grey to brown to brown to grey, dry to moist [moist zones associated with clayey zones (occasional); grey, medium plasticity]	
		1			GRAVEL and SAND (GC), fine to coarse, clayey, poorly graded, dense (density increases with depth), maximum particle size 200 mm, flat and elongated, sub-rounded to sub-angular, grey-brown to brown-grey, moist, weak cementation (becomes moderate at 1.5 m and strong at 4 m), strong reaction to HCl, trace roots to 0.6 m.	
1		2				
2						
3		3				
		4				
4					4.0 / 883.9 End of Test Pit at 4.0 m.	
5						

Su - kPa
25 75 125 175 225
UC/2 P.PEN/2
WATER1 WATER2 WATER3
% FINES SPT N LPT N
W_P% W% W_L%
20 40 60 80

Klohn Crippen Berger

PROJECT NO.: M09871A01
PROJECT: Ajax Mine Groundwater Study
LOCATION: Jacko Lake
LOGGED BY: AH **CHECKED BY:** MC
SHEET 1 **OF** 1 **HOLE NO.:** TP-C

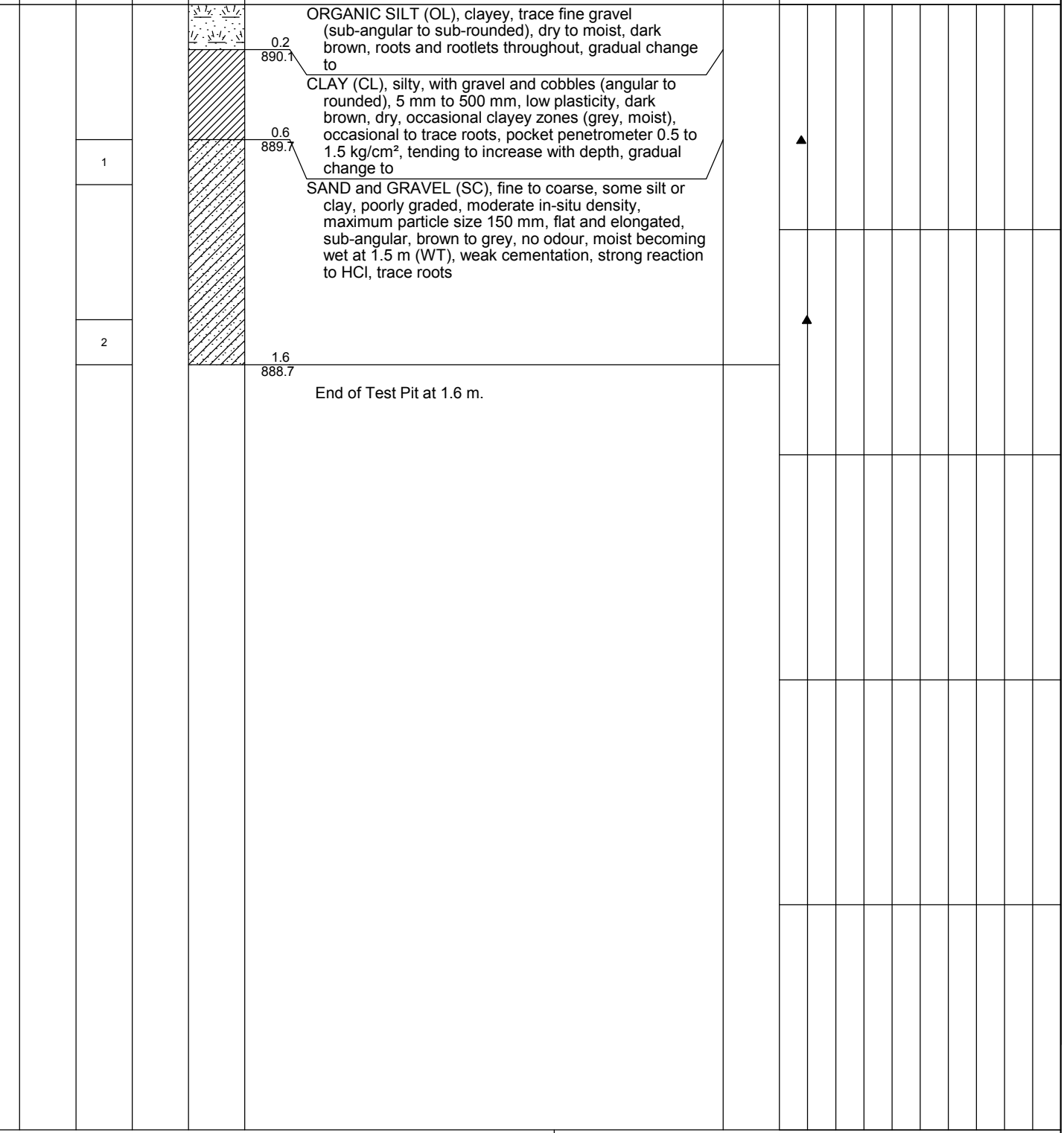
KCBL_TEST_PITS-SI 140624 AJAX OVERBURDEN_ES.GPJ KC_DATA.GDT 3/11/15

TEST PIT LOG TP-D

STARTED: Aug 20, 2014 **FINISHED:** Aug 20, 2014
METHOD: Excavator
GROUND ELEV. (m): 890.3
COORDINATES (m): N 682958 E 5609524

DEPTH (m)	SPT BLOWS PER 0.15m	SAMPLE TYPE AND NO.	CORE RECOVERY	SYMBOL	DESCRIPTION OF MATERIALS	INSTRUMENT DETAILS
					ORGANIC SILT (OL), clayey, trace fine gravel (sub-angular to sub-rounded), dry to moist, dark brown, roots and rootlets throughout, gradual change to	
0.2 (890.1)					CLAY (CL), silty, with gravel and cobbles (angular to rounded), 5 mm to 500 mm, low plasticity, dark brown, dry, occasional clayey zones (grey, moist), occasional to trace roots, pocket penetrometer 0.5 to 1.5 kg/cm², tending to increase with depth, gradual change to	
0.6 (889.7)		1			SAND and GRAVEL (SC), fine to coarse, some silt or clay, poorly graded, moderate in-situ density, maximum particle size 150 mm, flat and elongated, sub-angular, brown to grey, no odour, moist becoming wet at 1.5 m (WT), weak cementation, strong reaction to HCl, trace roots	
		2				
1.6 (888.7)					End of Test Pit at 1.6 m.	

Su - kPa
25 75 125 175 225
UC/2 P.PEN/2
WATER1 WATER2 WATER3
% FINES SPT N LPT N
W_P% W% W_L%
20 40 60 80



Klohn Crippen Berger

PROJECT NO.: M09871A01
PROJECT: Ajax Mine Groundwater Study
LOCATION: Jacko Lake
LOGGED BY: AH **CHECKED BY:** MC
SHEET 1 **OF** 1 **HOLE NO.:** TP-D

KCBL_TEST_PITS-SI 140624 AJAX OVERBURDEN_ES.GPJ KC_DATA.GDT 3/11/15

VISUAL SOIL DESCRIPTION

(ASTM 2487 - UNIFIED SOIL CLASSIFICATION SYSTEM)

Test Hole	Sample No.	Depth (m)	Group Symbol	Group Name	Soil Classification
TP-A		0.4	SC	CLAYEY SAND with GRAVEL	SAND; Gravelly, Clayey; some coarse gravel, some fine gravel; trace coarse sand, some medium sand, some fine sand; poorly graded, maximum particle size is 66 mm, flat, sub-angular; Fines are medium plasticity, none dilatancy, medium toughness, medium to high dry strength; none odor, moist, dark brown, soft to very soft, weak cementation, weak reaction to HCl, lots of roots.
TP-A		0.9	GC	CLAYEY GRAVEL with SAND	GRAVEL; Some Sand, Some Silt or Clay; and coarse gravel, some fine gravel; trace coarse sand, trace medium sand, some fine sand; poorly graded, maximum particle size is 60 mm, sub-angular; Fines are low plasticity, none dilatancy, low toughness, medium dry strength; none odor, moist, brown, soft, weak cementation, strong reaction to HCl, lots of roots.
TP-A		3.1	GC	CLAYEY GRAVEL with SAND	GRAVEL; Sandy, Some Silt or Clay; coarse gravelley, some fine gravel; trace coarse sand, some medium sand, some fine sand; well graded, maximum particle size is 60 mm, sub-angular and sub-rounded; Fines are low plasticity, none dilatancy, low toughness, medium dry strength; none odor, moist, brown, soft to firm, moderate cementation, weak reaction to HCl.
TP-B		0.6	GC	CLAYEY GRAVEL with SAND	GRAVEL; Sandy, Some Silt or Clay; and coarse gravel, some fine gravel; some coarse sand, some medium sand, trace fine sand; poorly graded, maximum particle size is 90 mm, flat and elongated, sub-angular and sub-rounded; Fines are medium plasticity, none dilatancy, medium toughness, medium to high dry strength; none odor, moist, brown, firm, moderate cementation, strong reaction to HCl, lots of roots.
TP-B		4.2	SC	CLAYEY SAND with GRAVEL	SAND; Gravelly, Clayey; trace coarse gravel, fine gravelley; trace coarse sand, some medium sand, some fine sand; poorly graded, maximum particle size is 33 mm, flat and elongated, sub-angular; Fines are low plasticity, none dilatancy, low to medium toughness, low dry strength; none odor, moist to dry, greyish brown, firm, moderate to strong cementation, strong reaction to HCl.
TP-C		0.6	GC	CLAYEY GRAVEL with SAND	GRAVEL; Sandy, Clayey; coarse gravelley, some fine gravel; trace coarse sand, trace medium sand, some fine sand; poorly graded, maximum particle size is 59 mm, flat and elongated, sub-angular and sub-rounded; Fines are medium plasticity, none dilatancy, medium toughness, medium dry strength; none odor, moist to dry, brown, soft, weak cementation, strong reaction to HCl, trace roots.
TP-C		1.55	SC	CLAYEY SAND with GRAVEL	SAND; Gravelly, Clayey; some coarse gravel, fine gravelley; trace coarse sand, some medium sand, fine sandy; poorly graded, maximum particle size is 48 mm, flat and elongated, sub-angular; Fines are low plasticity, none dilatancy, low to medium toughness, medium to high dry strength; none odor, moist, brown, firm, moderate cementation, strong reaction to HCl.
TP-C		3.4	GC	CLAYEY GRAVEL with SAND	GRAVEL; Sandy, Clayey; coarse gravelley, fine gravelley; trace coarse sand, trace medium sand, some fine sand; poorly graded, maximum particle size is 75 mm, flat and elongated, sub-angular; Fines are low to medium plasticity, none dilatancy, medium toughness, high dry strength; none odor, moist, brown, soft, weak cementation, strong reaction to HCl.
TP-C		4	SC	CLAYEY SAND with GRAVEL	SAND; Gravelly, Some Silt or Clay; trace coarse gravel, fine gravelley; trace coarse sand, some medium sand, some fine sand; poorly graded, maximum particle size is 56 mm, flat and elongated, sub-angular; Fines are low plasticity, none dilatancy, low to medium toughness, medium to high dry strength; none odor, moist to dry, brown, hard, blocky, strong cementation, strong reaction to HCl.
TP-D		0.6	SC	CLAYEY SAND with GRAVEL	SAND; And Gravel, Some Silt or Clay; some coarse gravel, fine gravelley; trace coarse sand, some medium sand, some fine sand; poorly graded, maximum particle size is 53 mm, flat and elongated, sub-angular; Fines are low to medium plasticity, none dilatancy, low to medium toughness, medium dry strength; none odor, moist, brown, soft, weak cementation, strong reaction to HCl, trace roots.
TP-D		1.5	SC	CLAYEY SAND with GRAVEL	SAND; Gravelly, Clayey; some coarse gravel, some fine gravel; trace coarse sand, some medium sand, some fine sand; poorly graded, maximum particle size is 56 mm, flat and elongated, sub-angular, sub-rounded; Fines are low to medium plasticity, none dilatancy, low to medium toughness, medium dry strength; none odor, moist, brown, soft, moderate cementation, strong reaction to HCl.
TP-1		1.00	GC	CLAYEY GRAVEL with SAND	GRAVEL; Some Sand, Some Silt or Clay; and coarse gravel, some fine gravel; trace coarse sand, trace medium sand, trace fine sand; well graded, maximum particle size is 99 mm, flat, sub-angular; Fines are low to medium plasticity, none dilatancy, low to medium toughness, low to medium dry strength; none odor, moist to dry, brown, very soft, weak cementation, strong reaction to HCl, trace roots.
TP-1		2.1	GC-GM	SILTY, CLAYEY GRAVEL with SAND	GRAVEL; Some Sand, Some Silt or Clay; and coarse gravel, some fine gravel; trace coarse sand, trace medium sand, some fine sand; poorly graded, maximum particle size is 97 mm, flat, sub-angular; Fines are low plasticity, slow dilatancy, low toughness, low to none dry strength; none odor, moist to dry, grey, soft, weak cementation, strong reaction to HCl, trace roots.
TP-2		1.7	GC-GM	SILTY, CLAYEY GRAVEL with SAND	GRAVEL; Sandy, Some Silt or Clay; coarse gravelley, some fine gravel; trace coarse sand, trace medium sand, some fine sand; poorly graded, maximum particle size is 114 mm, flat, sub-angular; Fines are low plasticity, none to slow dilatancy, low toughness, low to none dry strength; none odor, moist, brown, soft, weak cementation, strong reaction to HCl.

Klohn Crippen Berger

JOB NO.:	M09871A01		
PROJECT:	Ajax		
LOCATION:	BC		
DATE:	Oct 1, 2014		
TESTED BY:	BY	CHECKED BY:	JG

WATER CONTENT OF SOIL
(ASTM D2216)

Hole Number	Sample Number	Depth (m)	Wet Weight + Tare (g)	Dry Weight + Tare (g)	Tare (g)	Water Weight (g)	Total Dry Weight (g)	Water Content (%)
TP-A		0.4	1346.79	1184.38	169.00	162.41	1015.38	**15.99**
TP-A		0.9	2377.21	2191.04	163.96	186.17	2027.08	**9.18**
TP-A		3.1	2460.26	2264.19	162.08	196.07	2102.11	**9.33**
TP-B		0.6	2588.56	2376.72	168.41	211.84	2208.31	**9.59**
TP-B		4.2	2192.27	2058.29	159.33	133.98	1898.96	**7.06**
TP-C		0.6	1674.47	1538.19	139.11	136.28	1399.08	**9.74**
TP-C		1.55	1605.41	1494.21	162.85	111.20	1331.36	**8.35**
TP-C		3.4	1926.63	1836.94	165.04	89.69	1671.90	**5.36**
TP-C		4.0	2412.65	2270.90	158.22	141.75	2112.68	**6.71**
TP-D		0.6	1287.88	1206.27	156.77	81.61	1049.50	**7.78**
TP-D		1.5	1974.39	1812.68	155.42	161.71	1657.26	**9.76**
TP-1		1.0	3572.92	3388.38	177.64	184.54	3210.74	**5.75**
TP-1		2.1	2736.22	2587.07	164.12	149.15	2422.95	**6.16**
TP-2		1.7	2504.42	2374.79	170.38	129.63	2204.41	**5.88**

Klohn Crippen Berger

PROJECT NO:	M09871A01
PROJECT:	Ajax
LOCATION:	BC
DATE:	Oct 1, 2014
TESTED BY:	JG CHECKED BY: BY

SOILMOISTURE®

Guelph Permeameter

Single Head Method (1)

Reservoir Cross-sectional area in cm^2 (enter "35.22" for Combined and "2.16" for Inner reservoir):	2.16
Enter water Head Height ("H" in cm):	5
Enter the Borehole Radius ("a" in cm):	3

Enter the soil texture-structure category (enter one of the below numbers): **4**

1. Compacted, Structure-less, clayey or silty materials such as landfill caps and liners, lacustrine or marine sediments, etc.
2. Soils which are both fine textured (clayey or silty) and unstructured; may also include some fine sands.
3. Most structured soils from clays through loams; also includes unstructured medium and fine sands. The category most frequently applicable for agricultural soils.
4. Coarse and gravely sands; may also include some highly structured soils with large and/or numerous cracks, macropors, etc

Steady State Rate of Water Level Change ("R" in cm/min): **0.9001**

Res Type	2.16
H	5
a	3
H/a	1.667
a*	0.36
C0.01	0.809
C0.04	0.842
C0.12	0.803
C0.36	0.803
C	0.803
R	0.900
Q	0.032
pi	3.142

$\alpha^* =$ **0.36** cm^{-1}

$C =$ **0.803154**

$Q =$ **0.032404**

$K_{fs} =$ **9.75E-05** *cm/sec*
5.85E-03 *cm/min*
9.75E-07 *m/sec*
2.30E-03 *inch/min*
3.84E-05 *inch/sec*

$\Phi_m =$ **2.71E-04** cm^2/min

SOILMOISTURE®

Guelph Permeameter

Single Head Method (1)

Reservoir Cross-sectional area in cm^2 (enter "35.22" for Combined and "2.16" for Inner reservoir):	2.16
Enter water Head Height ("H" in cm):	10
Enter the Borehole Radius ("a" in cm):	3

Enter the soil texture-structure category (enter one of the below numbers): **4**

1. Compacted, Structure-less, clayey or silty materials such as landfill caps and liners, lacustrine or marine sediments, etc.
2. Soils which are both fine textured (clayey or silty) and unstructured; may also include some fine sands.
3. Most structured soils from clays through loams; also includes unstructured medium and fine sands. The category most frequently applicable for agricultural soils.
4. Coarse and gravely sands; may also include some highly structured soils with large and/or numerous cracks, macropors, etc

Steady State Rate of Water Level Change ("R" in cm/min): **0.3375**

Res Type	2.16
H	10
a	3
H/a	3.333
a*	0.36
C0.01	1.218
C0.04	1.29
C0.12	1.288
C0.36	1.288
C	1.288
R	0.338
Q	0.012
pi	3.142

$\alpha^* =$ 0.36 cm^{-1}

$C =$ 1.287543

$Q =$ 0.01215

$K_{fs} =$	1.86E-05	cm/sec
	1.12E-03	cm/min
	1.86E-07	m/sec
	4.40E-04	inch/min
	7.34E-06	inch/sec

$\Phi_m =$ 5.18E-05 cm^2/min

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Guelph Permeameter

Single Head Method (1)

Reservoir Cross-sectional area in cm^2 (enter "35.22" for Combined and "2.16" for Inner reservoir):	2.16
Enter water Head Height ("H" in cm):	15
Enter the Borehole Radius ("a" in cm):	3

Enter the soil texture-structure category (enter one of the below numbers): **4**

1. Compacted, Structure-less, clayey or silty materials such as landfill caps and liners, lacustrine or marine sediments, etc.
2. Soils which are both fine textured (clayey or silty) and unstructured; may also include some fine sands.
3. Most structured soils from clays through loams; also includes unstructured medium and fine sands. The category most frequently applicable for agricultural soils.
4. Coarse and gravely sands; may also include some highly structured soils with large and/or numerous cracks, macropors, etc

Steady State Rate of Water Level Change ("R" in cm/min): **0.2711**

Res Type	2.16
H	15
a	3
H/a	5
a*	0.36
C0.01	1.518
C0.04	1.629
C0.12	1.667
C0.36	1.667
C	1.667
R	0.271
Q	0.01
pi	3.142

$\alpha^* =$ 0.36 cm^{-1}

$C =$ 1.666893

$Q =$ 0.00976

$K_{fs} =$ 9.44E-06 cm/sec
5.67E-04 cm/min
9.44E-08 m/sec
2.23E-04 inch/min
3.72E-06 inch/sec

$\Phi_m =$ 2.62E-05 cm^2/min

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Single Head Method (1)

Reservoir Cross-sectional area in cm^2 (enter "35.22" for Combined and "2.16" for Inner reservoir):	2.16
Enter water Head Height ("H" in cm):	15
Enter the Borehole Radius ("a" in cm):	3

Enter the soil texture-structure category (enter one of the below numbers): **2**

1. Compacted, Structure-less, clayey or silty materials such as landfill caps and liners, lacustrine or marine sediments, etc.
2. Soils which are both fine textured (clayey or silty) and unstructured; may also include some fine sands.
3. Most structured soils from clays through loams; also includes unstructured medium and fine sands. The category most frequently applicable for agricultural soils.
4. Coarse and gravely sands; may also include some highly structured soils with large and/or numerous cracks, macropors, etc

Steady State Rate of Water Level Change ("R" in cm/min): **0.2711**

Res Type	2.16
H	15
a	3
H/a	5
a*	0.04
C0.01	1.518
C0.04	1.629
C0.12	1.667
C0.36	1.667
C	1.629
R	0.271
Q	0.01
pi	3.142

$\alpha^* =$ 0.04 cm^{-1}

$C =$ 1.629144

$Q =$ 0.00976

$K_{fs} =$	4.17E-06	cm/sec
	2.50E-04	cm/min
	4.17E-08	m/sec
	9.84E-05	inch/min
	1.64E-06	inch/sec

$\Phi_m =$ 1.04E-04 cm^2/min

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Single Head Method (1)

Reservoir Cross-sectional area in cm^2 (enter "35.22" for Combined and "2.16" for Inner reservoir):	2.16
Enter water Head Height ("H" in cm):	5
Enter the Borehole Radius ("a" in cm):	3

Enter the soil texture-structure category (enter one of the below numbers): **2**

1. Compacted, Structure-less, clayey or silty materials such as landfill caps and liners, lacustrine or marine sediments, etc.
2. Soils which are both fine textured (clayey or silty) and unstructured; may also include some fine sands.
3. Most structured soils from clays through loams; also includes unstructured medium and fine sands. The category most frequently applicable for agricultural soils.
4. Coarse and gravely sands; may also include some highly structured soils with large and/or numerous cracks, macropors, etc

Steady State Rate of Water Level Change ("R" in cm/min): **0.1500**

Res Type	2.16
H	5
a	3
H/a	1.667
a*	0.04
C0.01	0.809
C0.04	0.842
C0.12	0.803
C0.36	0.803
C	0.842
R	0.150
Q	0.005
pi	3.142

$\alpha^* =$ 0.04 cm^{-1}

$C =$ 0.842059

$Q =$ 0.0054

$K_{fs} =$	4.71E-06	cm/sec
	2.82E-04	cm/min
	4.71E-08	m/sec
	1.11E-04	inch/min
	1.85E-06	inch/sec

$\Phi_m =$ 1.18E-04 cm^2/min

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Single Head Method (1)

Reservoir Cross-sectional area in cm^2 (enter "35.22" for Combined and "2.16" for Inner reservoir):	2.16
Enter water Head Height ("H" in cm):	10
Enter the Borehole Radius ("a" in cm):	3

Enter the soil texture-structure category (enter one of the below numbers): **2**

1. Compacted, Structure-less, clayey or silty materials such as landfill caps and liners, lacustrine or marine sediments, etc.
2. Soils which are both fine textured (clayey or silty) and unstructured; may also include some fine sands.
3. Most structured soils from clays through loams; also includes unstructured medium and fine sands. The category most frequently applicable for agricultural soils.
4. Coarse and gravely sands; may also include some highly structured soils with large and/or numerous cracks, macropors, etc

Steady State Rate of Water Level Change ("R" in cm/min): **0.1500**

Res Type	2.16
H	10
a	3
H/a	3.333
a*	0.04
C0.01	1.218
C0.04	1.29
C0.12	1.288
C0.36	1.288
C	1.29
R	0.150
Q	0.005
pi	3.142

$\alpha^* =$ 0.04 cm^{-1}

$C =$ 1.290234

$Q =$ 0.0054

$K_{fs} =$ 3.12E-06 cm/sec
1.87E-04 cm/min
3.12E-08 m/sec
7.36E-05 inch/min
1.23E-06 inch/sec

$\Phi_m =$ 7.79E-05 cm^2/min

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Single Head Method (1)

Reservoir Cross-sectional area in cm^2 (enter "35.22" for Combined and "2.16" for Inner reservoir):	2.16
Enter water Head Height ("H" in cm):	15
Enter the Borehole Radius ("a" in cm):	3

Enter the soil texture-structure category (enter one of the below numbers): **2**

1. Compacted, Structure-less, clayey or silty materials such as landfill caps and liners, lacustrine or marine sediments, etc.
2. Soils which are both fine textured (clayey or silty) and unstructured; may also include some fine sands.
3. Most structured soils from clays through loams; also includes unstructured medium and fine sands. The category most frequently applicable for agricultural soils.
4. Coarse and gravely sands; may also include some highly structured soils with large and/or numerous cracks, macropors, etc

Steady State Rate of Water Level Change ("R" in cm/min): **0.2500**

Res Type	2.16
H	15
a	3
H/a	5
a*	0.04
C0.01	1.518
C0.04	1.629
C0.12	1.667
C0.36	1.667
C	1.629
R	0.250
Q	0.009
pi	3.142

$\alpha^* =$ 0.04 cm^{-1}

$C =$ 1.629144

$Q =$ 0.009

$K_{fs} =$	3.84E-06	cm/sec
	2.31E-04	cm/min
	3.84E-08	m/sec
	9.08E-05	inch/min
	1.51E-06	inch/sec

$\Phi_m =$ 9.61E-05 cm^2/min

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Single Head Method (1)

Reservoir Cross-sectional area in cm^2 (enter "35.22" for Combined and "2.16" for Inner reservoir):	2.16
Enter water Head Height ("H" in cm):	10
Enter the Borehole Radius ("a" in cm):	3

Enter the soil texture-structure category (enter one of the below numbers): **2**

1. Compacted, Structure-less, clayey or silty materials such as landfill caps and liners, lacustrine or marine sediments, etc.
2. Soils which are both fine textured (clayey or silty) and unstructured; may also include some fine sands.
3. Most structured soils from clays through loams; also includes unstructured medium and fine sands. The category most frequently applicable for agricultural soils.
4. Coarse and gravely sands; may also include some highly structured soils with large and/or numerous cracks, macropors, etc

Steady State Rate of Water Level Change ("R" in cm/min): **0.3625**

Res Type	2.16
H	10
a	3
H/a	3.333
a*	0.04
C0.01	1.218
C0.04	1.29
C0.12	1.288
C0.36	1.288
C	1.29
R	0.363
Q	0.013
pi	3.142

$\alpha^* =$ 0.04 cm^{-1}

$C =$ 1.290234

$Q =$ 0.01305

$K_{fs} =$ 7.53E-06 *cm/sec*
4.52E-04 *cm/min*
7.53E-08 *m/sec*
1.78E-04 *inch/min*
2.97E-06 *inch/sec*

$\Phi_m =$ 1.88E-04 cm^2/min

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Single Head Method (1)

Reservoir Cross-sectional area in cm^2 (enter "35.22" for Combined and "2.16" for Inner reservoir):	2.16
Enter water Head Height ("H" in cm):	5
Enter the Borehole Radius ("a" in cm):	3

Enter the soil texture-structure category (enter one of the below numbers): **4**

1. Compacted, Structure-less, clayey or silty materials such as landfill caps and liners, lacustrine or marine sediments, etc.
2. Soils which are both fine textured (clayey or silty) and unstructured; may also include some fine sands.
3. Most structured soils from clays through loams; also includes unstructured medium and fine sands. The category most frequently applicable for agricultural soils.
4. Coarse and gravely sands; may also include some highly structured soils with large and/or numerous cracks, macropors, etc

Steady State Rate of Water Level Change ("R" in cm/min): **0.1333**

Res Type	2.16
H	5
a	3
H/a	1.667
a*	0.36
C0.01	0.809
C0.04	0.842
C0.12	0.803
C0.36	0.803
C	0.803
R	0.133
Q	0.005
pi	3.142

$\alpha^* =$ **0.36** cm^{-1}

$C =$ **0.803154**

$Q =$ **0.004799**

$K_{fs} =$	1.44E-05	cm/sec
	8.66E-04	cm/min
	1.44E-07	m/sec
	3.41E-04	inch/min
	5.68E-06	inch/sec

$\Phi_m =$ **4.01E-05** cm^2/min

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Single Head Method (1)

Reservoir Cross-sectional area in cm^2 (enter "35.22" for Combined and "2.16" for Inner reservoir):	2.16
Enter water Head Height ("H" in cm):	10
Enter the Borehole Radius ("a" in cm):	3

Enter the soil texture-structure category (enter one of the below numbers): **4**

1. Compacted, Structure-less, clayey or silty materials such as landfill caps and liners, lacustrine or marine sediments, etc.
2. Soils which are both fine textured (clayey or silty) and unstructured; may also include some fine sands.
3. Most structured soils from clays through loams; also includes unstructured medium and fine sands. The category most frequently applicable for agricultural soils.
4. Coarse and gravely sands; may also include some highly structured soils with large and/or numerous cracks, macropors, etc

Steady State Rate of Water Level Change ("R" in cm/min): **0.1333**

Res Type	2.16
H	10
a	3
H/a	3.333
a*	0.36
C0.01	1.218
C0.04	1.29
C0.12	1.288
C0.36	1.288
C	1.288
R	0.133
Q	0.005
pi	3.142

$\alpha^* =$ 0.36 cm^{-1}

$C =$ 1.287543

$Q =$ 0.004799

$K_{fs} =$	7.36E-06	cm/sec
	4.42E-04	cm/min
	7.36E-08	m/sec
	1.74E-04	inch/min
	2.90E-06	inch/sec

$\Phi_m =$ 2.05E-05 cm^2/min

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Single Head Method (1)

Reservoir Cross-sectional area in cm^2 (enter "35.22" for Combined and "2.16" for Inner reservoir):	2.16
Enter water Head Height ("H" in cm):	10
Enter the Borehole Radius ("a" in cm):	3

Enter the soil texture-structure category (enter one of the below numbers): **2**

1. Compacted, Structure-less, clayey or silty materials such as landfill caps and liners, lacustrine or marine sediments, etc.
2. Soils which are both fine textured (clayey or silty) and unstructured; may also include some fine sands.
3. Most structured soils from clays through loams; also includes unstructured medium and fine sands. The category most frequently applicable for agricultural soils.
4. Coarse and gravely sands; may also include some highly structured soils with large and/or numerous cracks, macropors, etc

Steady State Rate of Water Level Change ("R" in cm/min): **0.1529**

Res Type	2.16
H	10
a	3
H/a	3.333
a*	0.04
C0.01	1.218
C0.04	1.29
C0.12	1.288
C0.36	1.288
C	1.29
R	0.153
Q	0.006
pi	3.142

$\alpha^* =$ **0.04** cm^{-1}

$C =$ **1.290234**

$Q =$ **0.005504**

$K_{fs} =$	**3.18E-06**	*cm/sec*
	1.91E-04	*cm/min*
	3.18E-08	*m/sec*
	7.50E-05	*inch/min*
	1.25E-06	*inch/sec*

$\Phi_m =$ **7.94E-05** cm^2/min

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Single Head Method (1)

Reservoir Cross-sectional area in cm^2 (enter "35.22" for Combined and "2.16" for Inner reservoir):	2.16
Enter water Head Height ("H" in cm):	20
Enter the Borehole Radius ("a" in cm):	3

Enter the soil texture-structure category (enter one of the below numbers): **2**

1. Compacted, Structure-less, clayey or silty materials such as landfill caps and liners, lacustrine or marine sediments, etc.
2. Soils which are both fine textured (clayey or silty) and unstructured; may also include some fine sands.
3. Most structured soils from clays through loams; also includes unstructured medium and fine sands. The category most frequently applicable for agricultural soils.
4. Coarse and gravely sands; may also include some highly structured soils with large and/or numerous cracks, macropors, etc

Steady State Rate of Water Level Change ("R" in cm/min): **0.1975**

Res Type	2.16
H	20
a	3
H/a	6.667
a*	0.04
C0.01	1.755
C0.04	1.903
C0.12	1.98
C0.36	1.98
C	1.903
R	0.198
Q	0.007
pi	3.142

$\alpha^* =$ **0.04** cm^{-1}

$C =$ **1.903071**

$Q =$ **0.00711**

$K_{fs} =$	2.37E-06	cm/sec
	1.42E-04	cm/min
	2.37E-08	m/sec
	5.60E-05	inch/min
	9.33E-07	inch/sec

$\Phi_m =$ **5.93E-05** cm^2/min

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Single Head Method (1)

Reservoir Cross-sectional area in cm^2 (enter "35.22" for Combined and "2.16" for Inner reservoir):	2.16
Enter water Head Height ("H" in cm):	5
Enter the Borehole Radius ("a" in cm):	3

Enter the soil texture-structure category (enter one of the below numbers): **2**

1. Compacted, Structure-less, clayey or silty materials such as landfill caps and liners, lacustrine or marine sediments, etc.
2. Soils which are both fine textured (clayey or silty) and unstructured; may also include some fine sands.
3. Most structured soils from clays through loams; also includes unstructured medium and fine sands. The category most frequently applicable for agricultural soils.
4. Coarse and gravely sands; may also include some highly structured soils with large and/or numerous cracks, macropors, etc

Steady State Rate of Water Level Change ("R" in cm/min): **0.3000**

Res Type	2.16
H	5
a	3
H/a	1.667
a*	0.04
C0.01	0.809
C0.04	0.842
C0.12	0.803
C0.36	0.803
C	0.842
R	0.300
Q	0.011
pi	3.142

$\alpha^* =$ 0.04 cm^{-1}

$C =$ 0.842059

$Q =$ 0.0108

$K_{fs} =$	9.41E-06	cm/sec
	5.65E-04	cm/min
	9.41E-08	m/sec
	2.22E-04	inch/min
	3.71E-06	inch/sec

$\Phi_m =$ 2.35E-04 cm^2/min

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Single Head Method (1)

Reservoir Cross-sectional area in cm^2 (enter "35.22" for Combined and "2.16" for Inner reservoir):	2.16
Enter water Head Height ("H" in cm):	10
Enter the Borehole Radius ("a" in cm):	3

Enter the soil texture-structure category (enter one of the below numbers): 4

1. Compacted, Structure-less, clayey or silty materials such as landfill caps and liners, lacustrine or marine sediments, etc.
2. Soils which are both fine textured (clayey or silty) and unstructured; may also include some fine sands.
3. Most structured soils from clays through loams; also includes unstructured medium and fine sands. The category most frequently applicable for agricultural soils.
4. Coarse and gravely sands; may also include some highly structured soils with large and/or numerous cracks, macropors, etc

Steady State Rate of Water Level Change ("R" in cm/min): 0.3000

Res Type	2.16
H	10
a	3
H/a	3.333
a*	0.36
C0.01	1.218
C0.04	1.29
C0.12	1.288
C0.36	1.288
C	1.288
R	0.300
Q	0.011
pi	3.142

α^*=	0.36	cm^{-1}
C =	1.287543	
Q =	0.0108	
K_{fs} =	1.66E-05	cm/sec
	9.94E-04	cm/min
	1.66E-07	m/sec
	3.91E-04	inch/min
	6.52E-06	inch/sec
Φ_m =	4.60E-05	cm^2/min

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Single Head Method (1)

Reservoir Cross-sectional area in cm^2 (enter "35.22" for Combined and "2.16" for Inner reservoir):	2.16
Enter water Head Height ("H" in cm):	15
Enter the Borehole Radius ("a" in cm):	3

Enter the soil texture-structure category (enter one of the below numbers): **4**

1. Compacted, Structure-less, clayey or silty materials such as landfill caps and liners, lacustrine or marine sediments, etc.
2. Soils which are both fine textured (clayey or silty) and unstructured; may also include some fine sands.
3. Most structured soils from clays through loams; also includes unstructured medium and fine sands. The category most frequently applicable for agricultural soils.
4. Coarse and gravely sands; may also include some highly structured soils with large and/or numerous cracks, macropors, etc

Steady State Rate of Water Level Change ("R" in cm/min): **0.3000**

Res Type	2.16
H	15
a	3
H/a	5
a*	0.36
C0.01	1.518
C0.04	1.629
C0.12	1.667
C0.36	1.667
C	1.667
R	0.300
Q	0.011
pi	3.142

$\alpha^* =$ 0.36 cm^{-1}

$C =$ 1.666893

$Q =$ 0.0108

$K_{fs} =$	1.05E-05	cm/sec
	6.27E-04	cm/min
	1.05E-07	m/sec
	2.47E-04	inch/min
	4.11E-06	inch/sec

$\Phi_m =$ 2.90E-05 cm^2/min

Appendix II
Pumping Test Interpretation

II-1 PUMPING TEST CONFIGURATION

II-1.1.1 Background

A constant rate pumping test was conducted by BGC Engineering Inc. (BGC) for Abacus Mining and Exploration Inc. (AME) at BGC10-PW01 as part of the feasibility level assessment undertaken in 2011 for the Ajax Mine Project. The test program consisted of a variable-rate test (step-test) to determine stable pumping yields and assess specific capacity of the well, followed by a constant-rate pumping test at approximately 0.5 L/s for eight days followed by recovery monitoring. Testing was undertaken to evaluate groundwater drawdown response in the vicinity of Jacko Lake and the then-proposed pit extent, and to support an assessment of whether dewatering using perimeter wells may be a feasible option for pit depressurization.

The results of the pumping test program suggested a heterogeneous aquifer with barrier boundary effects indicative of limited recharge and fractured bedrock. Analyses of the recovery response suggested that the Jacko Lake did not contribute appreciable recharge to the well during pumping.

II-1.1.2 Repeat of 2011 Constant Rate Test

KCB recommended that the constant rate test undertaken by BGC be repeated to include the new monitoring locations installed during the 2014 site investigation program (monitoring wells and vibrating wire piezometers).

This test was intended to reassess the drawdown response and heterogeneity based on a more extensive monitoring network, which includes instrumentation across faults and close to Jacko Lake. This test was designed to assist in assessing connectivity between Jacko Lake and the proposed pit extents by:

- monitoring instrument response in the expanded well network;
- improving estimates of aquifer parameters and assessing heterogeneity; and
- collection of water quality samples at the beginning and ending of the test to monitor for recharge from other aquifer or surface water (Jacko Lake) sources.

As stable pumping yields were determined for BGC10-PW01 during the 2011 BGC test, KCB proposed to repeat only the constant rate portion of the test. The determination to conduct the test for seven (7) days was made based on a review of the *BGC Prototype Dewatering Well and Pumping Test Project* memorandum (BGC, 2011) which indicated response at the VWPs installed in BGC10-MWA/B shortly after the start of the constant rate test, and response at the Knight Piesold monitoring wells and VWPs in geotechnical holes at greater distance to the pumping well observed only after four to seven days after commencement of the test. Recovery monitoring also indicated a delayed response in these well locations; shortening the duration of the test was therefore not considered appropriate.

The proposed pumping test configuration is shown in Table II-1.1.

Table II-1.1 Proposed Constant Rate Pumping Test Configuration

Pumping Test Configuration	
Pumping Rate	~0.6 L/s (~8.5 GPM to 10 GPM)
Pumping Duration	168 hours
Recovery Monitoring	95% recovery in BGC10-PW01
Pump Installation Depth (intake)	~193 mbgs
Monitoring Network (monitoring wells and VWPs)	BGC10-MWA/B AW-09-103-S/D AW-09-104 AW-10-105-S/D AW-10-106 AE-10-065 AJGW01-D AJGW02-S AJGW03-D AJGW04-D AJGW07-S/D KAX-14-107S/D KAX-14-108S/D KAX-14-114S/D KAX-14-121 KAX-14-124A/B KAX-14-128S/D KAX-14-130A/B

Aqua Tech Services of Kelowna, BC was retained by KGHM to conduct the pumping test and monitor drawdown and recovery from October 21, 2014 to October 31, 2014. KCB and KGHM personnel installed pressure transducers in standpipe piezometers that did not have permanent data loggers prior to commencement of the test. Data from the pressure transducers and VWPs were downloaded by KGHM personnel following completion of the test. Manual water level measurements were collected by Aqua Tech personnel throughout the test and recovery period in the pumping well and in the designated monitoring wells.

II-1.1.3 Constant Rate Test Results and Interpretation

Drawdown and recovery response in the pumping well and at each of the monitoring locations, including manual water level measurements and data logger measurements, were reviewed in spreadsheets and analyzed using AQTESOLV version 4.50 (HydroSOLVE, 2007), an industry standard software package, to estimate aquifer parameters. AQTESOLV outputs are in this Appendix.

II-1.1.3.1 Evaluation of Aquifer and Pumping Well Conditions

A review of diagnostic plots and derivative plots was completed to characterize the aquifer response and flow behaviour.

Diagnostic Plots:

- Linear flow plot – not indicative of linear flow conditions (i.e., infinite conductivity fracture);
- Bilinear flow plot – not indicative of bilinear flow (e.g., channel aquifer with permeable walls);
- Spherical flow plot – not indicative of spherical flow (radial flow in both horizontal and vertical directions to a partially penetrating well, indicative of a uniform aquifer); and
- Radial flow plot:
  - Early time data indicate wellbore storage; and
  - Late time data indicate that aquifer is not infinite-acting (i.e., Cooper-Jacob analytical method conditions are not met and are not valid for test analyses).

Derivative Plot (Figure II.1):

- Early time data suggests well bore storage;
- No derivative plateau to suggest steady-state conditions;
- No recharge boundaries are indicated; and
- Late time data is rising, indicating limitations on flow and possible barrier boundary.

The review of well and aquifer behavior is summarized as follows:

- well bore storage;
- Cooper-Jacob assumptions are not valid;
- barrier boundary detected, indicating an aquifer of limited extent; and
- no indications of recharge were observed during the test.

The 2011 BGC test was analyzed using unconfined aquifer solutions; however, water levels in the pumping well and monitoring wells suggest confined aquifer conditions.

II-1.1.3.2 Singe Well Analysis

Based on the diagnostic evaluation, the following solutions were considered:

- Theis (1935) unconfined – not valid for aquifer conditions, but used in previous pumping test evaluation by BGC and therefore considered for comparison.
- Unconfined: Moench (1997).
- Confined: Papadopulos-Cooper (1967), with the caveat that Cooper-Jacob conditions are not met.
- Fractured: Moench (1984) with slab-shaped blocks and spherical-blocks.

The fractured-rock solutions provided a poor curve fit to the data, and were therefore not considered in detail. The Theis, Moench, and Papadopulos-Cooper results are shown in Figure II.2 to Figure II.4.

The Theis unconfined solution, while not matching the aquifer conceptualization, provides a reasonable fit for the data and was used for first order estimates of aquifer transmissivity. The Moench solution yielded a good fit to late time data and a reasonable fit to all the test data, but does not match early time.

The Papadopulos-Copper solution yielded a reasonable fit to the test data, and provided a better estimate of aquifer parameters than the unconfined solutions; however, the Papadopulos-Copper solution does not match well with early time test data suggesting that the confined model may not account for all the observed aquifer response.

Based on the inability of both the unconfined and confined analytical solutions to match early time test data, the Moench-Prickett (1972) analytical solution was considered. This solution was designed for pumping tests with conversion from confined to unconfined conditions during the test. Results are shown in Figure II.5.

This solution provides the best fit to site data; however, it does not include compensation for wellbore storage and does not match the early-mid part of the data where wellbore storage effects water level response.

Summary of Single Well Response Analysis

Aquifer transmissivity is estimated using the Moench-Prickett (1972) solution at 2.5 x 10^{-6} m^2/sec. Assuming an aquifer thickness of 100m, this equates to a hydraulic conductivity (K) value of approximately 2.5 x 10^{-8} m/sec. Aquifer Storativity cannot be accurately estimated from single well analyses, but results suggest a range of 0.001 (dimensionless). Assuming an aquifer thickness of 100m, the corresponding specific storage value is 1 x10^{-5} m^{-1}. This value is consistent with published ranges for fractured rock.

II-1.1.3.3 Multiple Well Analyses

Observation Well Data Set

The following observation wells were fitted with transducers or monitored manually during the pumping test at BGC10-PW01:

- KAX-14-107 S/D
- KAX-14-108 S/D
- KAX-14-114 S/D
- KAX-14-128 S/D

The following Vibrating Wire Piezometers (VWPs) were monitored during the test:

- BCG10-MWA/B
- AJGW01-D
- AJGW02-S/D
- AJGW03-D
- AJGW04-D
- AJGW07-S/D

Drawdown (> ~ 0.1m) was observed at the following locations, with maximum drawdown and distance from the pumping well indicated in meters:

- KAX-14-108 S (0.12 m, 248m)
- KAX-14-128 S (0.34 m, 52m)
- KAX-14-128 D (2.01 m, 52m)
- AJGW01-D (0.41m, 60m)

KAX-14-108S

KAX-14-108S is located approximately 250 m west-southwest of the pumping well between the two branching arms of Jacko Lake. Drawdown at this well was analyzed along with the pumping well to estimate bulk aquifer properties between these points.

Aquifer properties could not be reasonably approximated using any analytical solution for this pumping well-observation well pair. This is likely due to several factors, including:

- Principally, the lithology in the screen interval of the observation well (sand and gravel /glacial till) is materially different than the pumping well and is inferred to likely represent a different aquifer unit;
- Shallow screen interval of KAX-14-108S (31-36 m) relative to the pumping well;
- Long distance between wells (250 m); and
- Small amount of drawdown.

The inability to match a solution to this well pair is indicative of the differences in aquifer properties at each location, and variability in aquifer properties between these points.

KAX-14-108S was reevaluated using the Neuman-Witherspoon (1974) solution for a leaky two-aquifer system as it is in the non-pumped aquifer, but the solution would not converge to a reasonable approximation of the data.

KAX-14-128D

KAX-14-128S/D are located approximately 50 m north of the pumping well. KAX-14-128S is screened in sand and gravel / glacial till. KAX-14-128D is screened in fractured picrite, and drawdown was analyzed along with the pumping well to estimate bulk aquifer properties between these points in the primary aquifer unit being tested. Data for this well pair was analyzed using a simple confined aquifer solution (Papadapolous-Cooper (1967)), recognizing that the observation well did not undergo a conversion to unconfined conditions during testing that would warrant the use of Moench-Prickett. Further, since the degree of drawdown decreases exponentially away from the pumping well, the area of the aquifer between these wells that underwent the conversion to unconfined is likely to be small.

Results of the best fit curve are shown in Figure II.6.

The Papadopulos-Cooper analysis indicates:

- An excellent curve fit for the pumping well and a reasonable fit for the observation well, indicating that T estimates obtained with this solution are an accurate representation of bulk transmissivity in the aquifer between these points.
- That aquifer transmissivity values for the area of the aquifer between these wells is very similar to those obtained for the pumping well alone.

The magnitude (height) of the curve is highly sensitive to the aquifer Storativity value (S) for the observation well curve fit. The “height” hump of the observation well curve corresponds to a storage value for the aquifer of approximately 0.0065. However, this value is high for fractured rock, and may be influenced by the confined to unconfined transition in the pumping well or variations in lithology between the pumping well and observation well.

AJGW01-D

AJGW01-D is located approximately 60 m from the pumping well, screened at a depth of 11 m to 13 m in unknown formation. Data from this well pair were analyzed using a simple confined aquifer solution (Papadopulos-Cooper (1967). Results are shown in Figure II.7.

The primary drawdown well data is duplicated quite well by the analytical curve at S and T values consistent with results of single well analyses. However, the observation well data is not well matched.

Consequently, this well pair was also analyzed using the using the Neuman-Witherspoon (1974) solution for a leaky two-aquifer system (Figure II.8).

The pumping well response data matches fairly well to the theoretical Neuman-Witherspoon curve; however, the curve shape does not match the early time data well, likely due to effects described earlier including wellbore storage and other conditions that are not included mathematically in the Neuman-Witherspoon solution. The S value for the primary aquifer required to achieve a good curve

match for the observation well data is inconsistent with previous analyses, and results in a poor shape-match for the primary curve (pumping well).

Results of these analyses confirm previous T and S estimates for the primary aquifer. However, results for the shallow aquifer are complicated. Based on these analyses, it is likely that the transmissivity of the shallow aquifer is higher than the pumped aquifer, despite being significantly thinner.

Summary of Multi-Well Analyses

Bedrock Aquifer

During the pumping tests, appreciable drawdown was observed in only one bedrock monitoring well. Results from the BGC10-PW01–KAX-14-128D well pair suggest an aquifer transmissivity of 3.4×10^{-6} m^2/sec between these wells (hydraulic conductivity of 3.4×10^{-8} m/s based on an aquifer thickness of 100 m). And an aquifer storativity value (S) in the range of 0.002-0.006. These results are consistent with the single-well (pumping test) results.

Shallow Aquifer

Measureable drawdown was observed in 3 of the 7 wells screened in the shallow till aquifer (<20m) that were monitored during the test. One of these wells (AJGW01) yielded data that resulted in a reasonable match to the Neuman-Witherspoon solution for a two aquifer system confined by a leaky aquitard. Results suggest an aquifer transmissivity value of 5.5×10^{-5} m^2/sec. Storativity values could not be determined accurately. Results also suggest that the shallow aquifer has higher permeability than the bedrock aquifer by approximately 1-2 orders of magnitude.

II-1.1.3.4 Recovery Analysis

Based on the results of the diagnostic and derivative analyses, a recovery solution was selected to analyze the recovery response of the pumping well assuming the following conditions:

- partial penetration of the pumping well;
- wellbore storage; and
- a barrier or bounded aquifer.

The only solutions available in AQTESOLV that match these conditions are Moench (1997) for an unconfined aquifer and Dougherty-Babu (1984) for a confined aquifer; Dougherty-Babu is largely superseded by Moench (1997) and was not reviewed in detail.

Results of the analyses using the Moench (1997) unconfined solution are shown in Figure II.9. Results of the early and mid-time data match the theoretical curve quite well, likely because the aquifer is undergoing an unconfined recharge response during this time. Late time data does not match well, which is considered to reflect the aquifer undergoing recharge under confined conditions in late time.

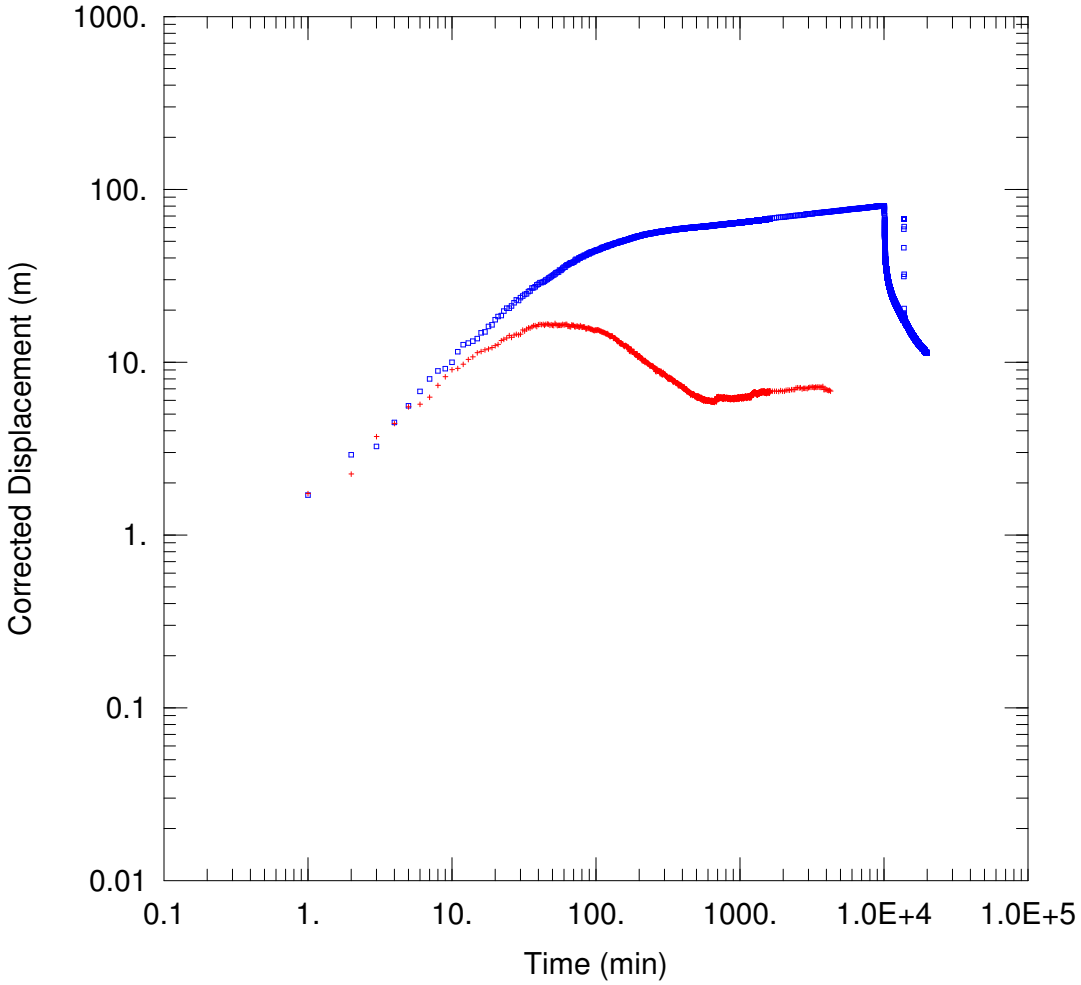

FIGURE II.1

PROJECT INFORMATION

Company: Klohn Crippen Berger
Client: KGHM Ajax Mining Inc.
Project: M09871A01
Location: Jacko Lake
Test Well: BGC10-PW01
Test Date: October 21, 2014

WELL DATA

Pumping Wells

Well Name	X (m)	Y (m)
BGC10-PW01	683365	5609531

Observation Wells

Well Name	X (m)	Y (m)
BGC10-PW01	683365	5609531

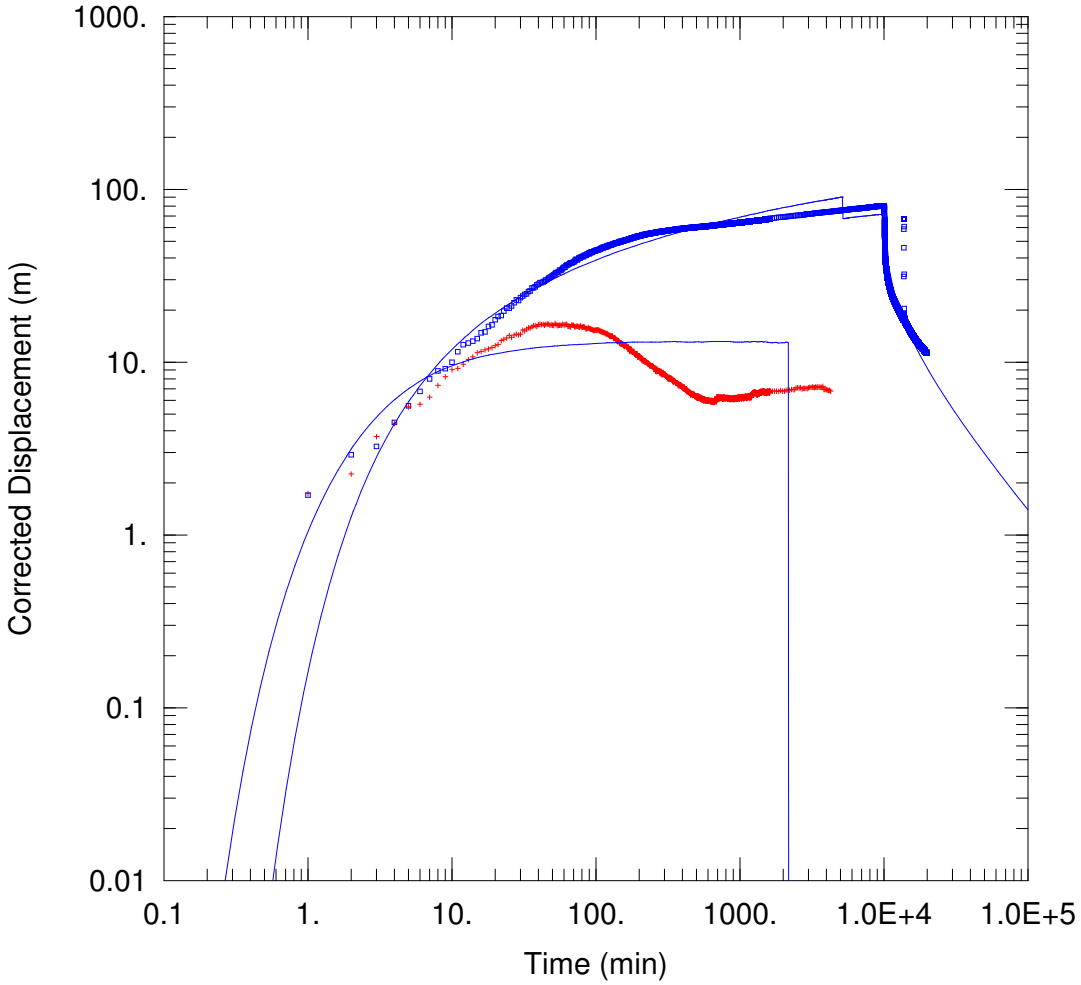

FIGURE II.2

PROJECT INFORMATION

Company: Klohn Crippen Berger
Client: KGHM Ajax Mining Inc.
Project: M09871A01
Location: Jacko Lake
Test Well: BGC10-PW01
Test Date: October 21, 2014

WELL DATA

Pumping Wells

Well Name	X (m)	Y (m)
BGC10-PW01	683365	5609531

Observation Wells

Well Name	X (m)	Y (m)
▫ BGC10-PW01	683365	5609531

SOLUTION

Aquifer Model: Unconfined
Solution Method: Theis

T = 3.485E-6 m^2/sec
S = 24.78
Kz/Kr = 1.
b = 180.4 m

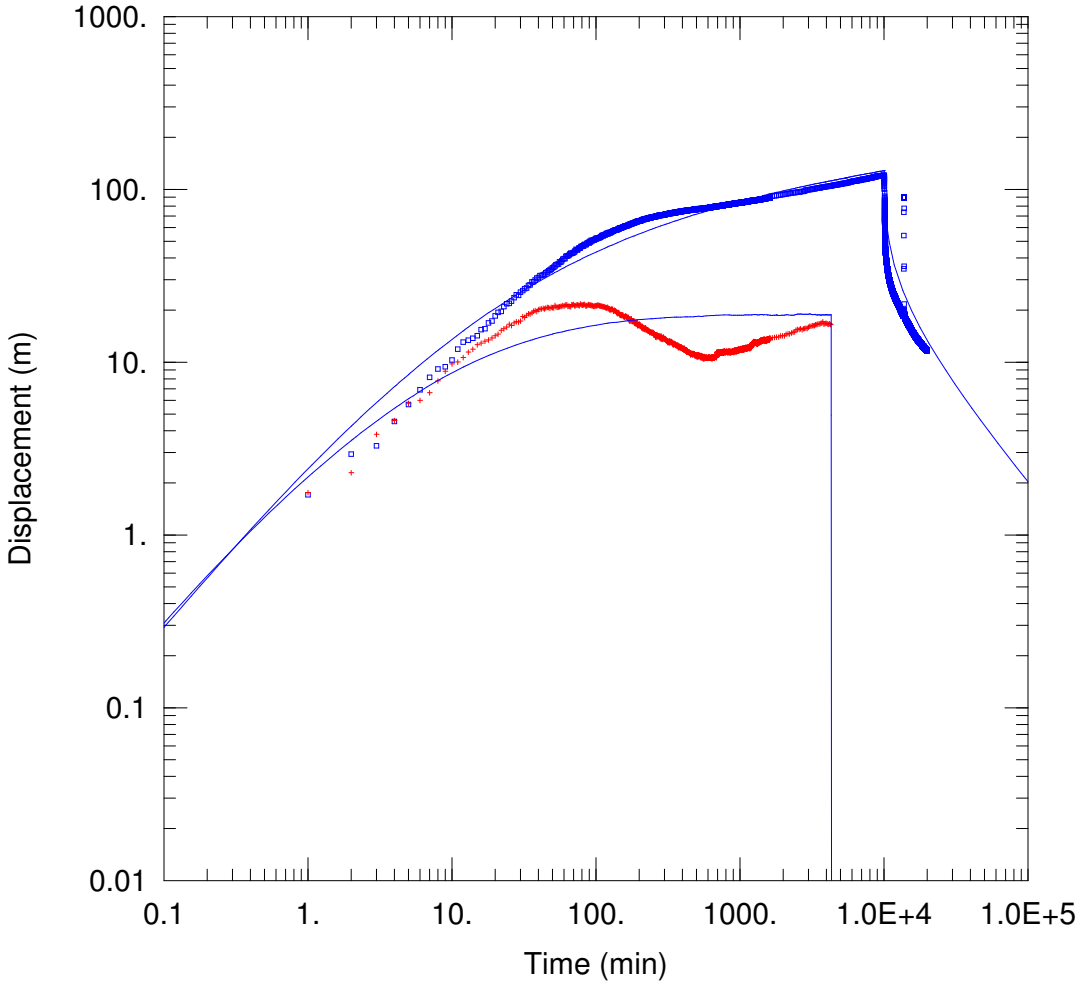

FIGURE II.3

PROJECT INFORMATION

Company: Klohn Crippen Berger
Client: KGHM Ajax Mining Inc.
Project: M09871A01
Location: Jacko Lake
Test Well: BGC10-PW01
Test Date: October 21, 2014

WELL DATA

Pumping Wells

Well Name	X (m)	Y (m)
BGC10-PW01	683365	5609531

Observation Wells

Well Name	X (m)	Y (m)
▫ BGC10-PW01	683365	5609531

SOLUTION

Aquifer Model: Unconfined
Solution Method: Moench

T = 2.212E-6 m^2/sec
Sy = 0.007807
Sw = 0.
r(c) = 0.05715 m

S = 0.008052
ß = 10.
r(w) = 0.4863 m
alpha = 1.0E+17 min^{-1}

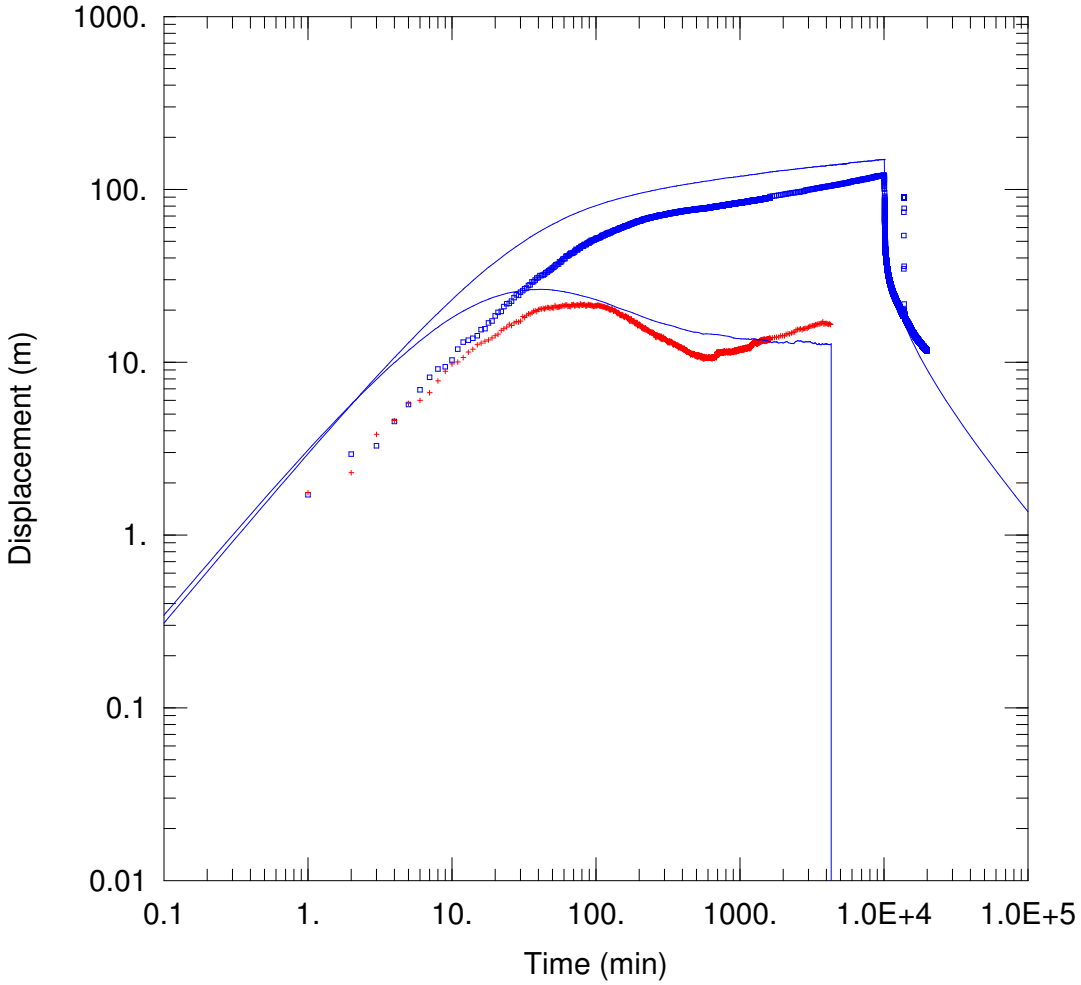

FIGURE II.4

PROJECT INFORMATION

Company: Klohn Crippen Berger
Client: KGHM Ajax Mining Inc.
Project: M09871A01
Location: Jacko Lake
Test Well: BGC10-PW01
Test Date: October 21, 2014

WELL DATA

Pumping Wells

Well Name	X (m)	Y (m)
BGC10-PW01	683365	5609531

Observation Wells

Well Name	X (m)	Y (m)
▫ BGC10-PW01	683365	5609531

SOLUTION

Aquifer Model: Confined
Solution Method: Papadopulos-Cooper

T = 3.313E-6 m^2/sec
S = 0.002621
r(w) = 0.1221 m
r(c) = 0.05715 m

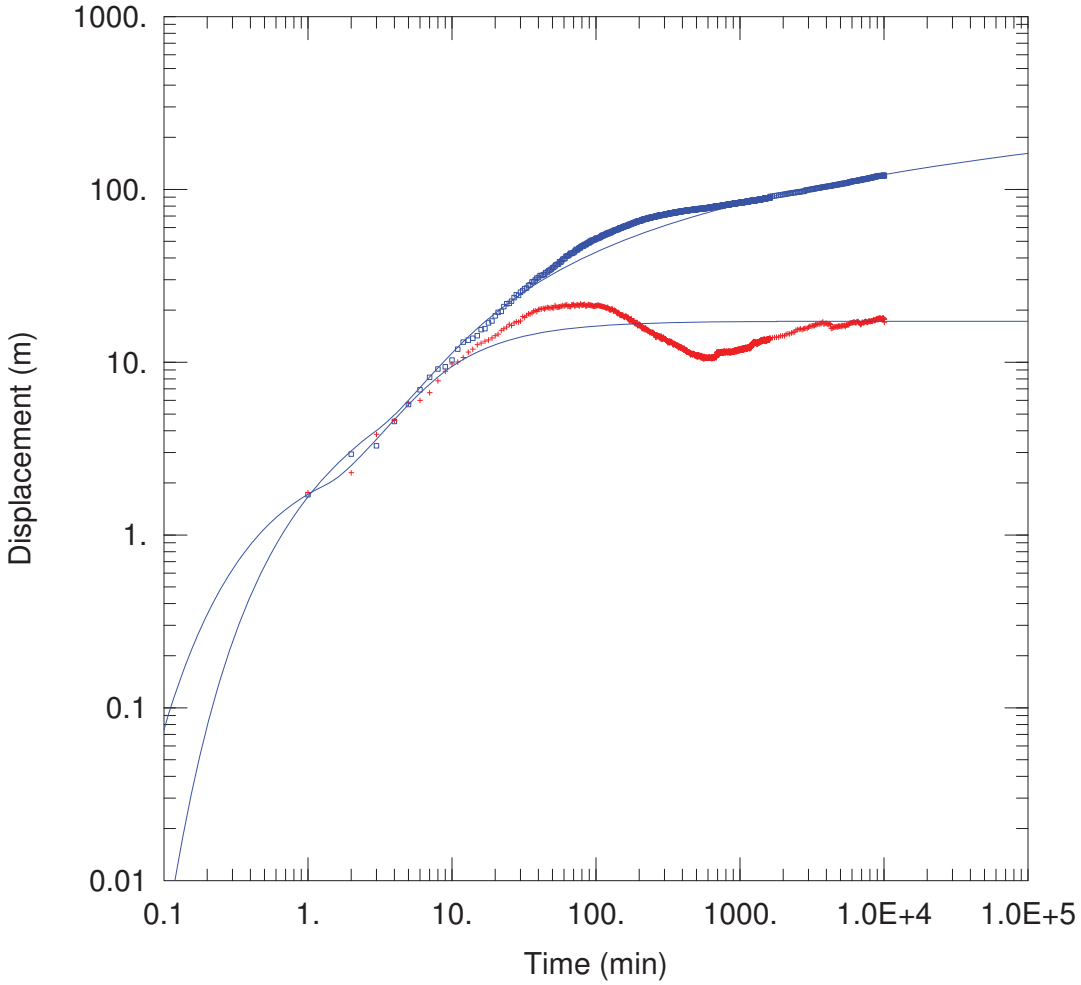

FIGURE II.5

PROJECT INFORMATION

Company: Klohn Crippen Berger
Client: KGHM International
Project: M09871A01
Location: Jacko Lake
Test Well: BGC10-PW01
Test Date: October 21, 2014

WELL DATA

Pumping Wells

Well Name	X (m)	Y (m)
BGC10-PW01	683365	5609531

Observation Wells

Well Name	X (m)	Y (m)
▫ BGC10-PW01	683365	5609531

SOLUTION

Aquifer Model: Confined
Solution Method: Moench-Prickett

T = 2.474E-6 m^2/sec
S = 0.001219
Sy = 0.01453
H-b = 3.981 m

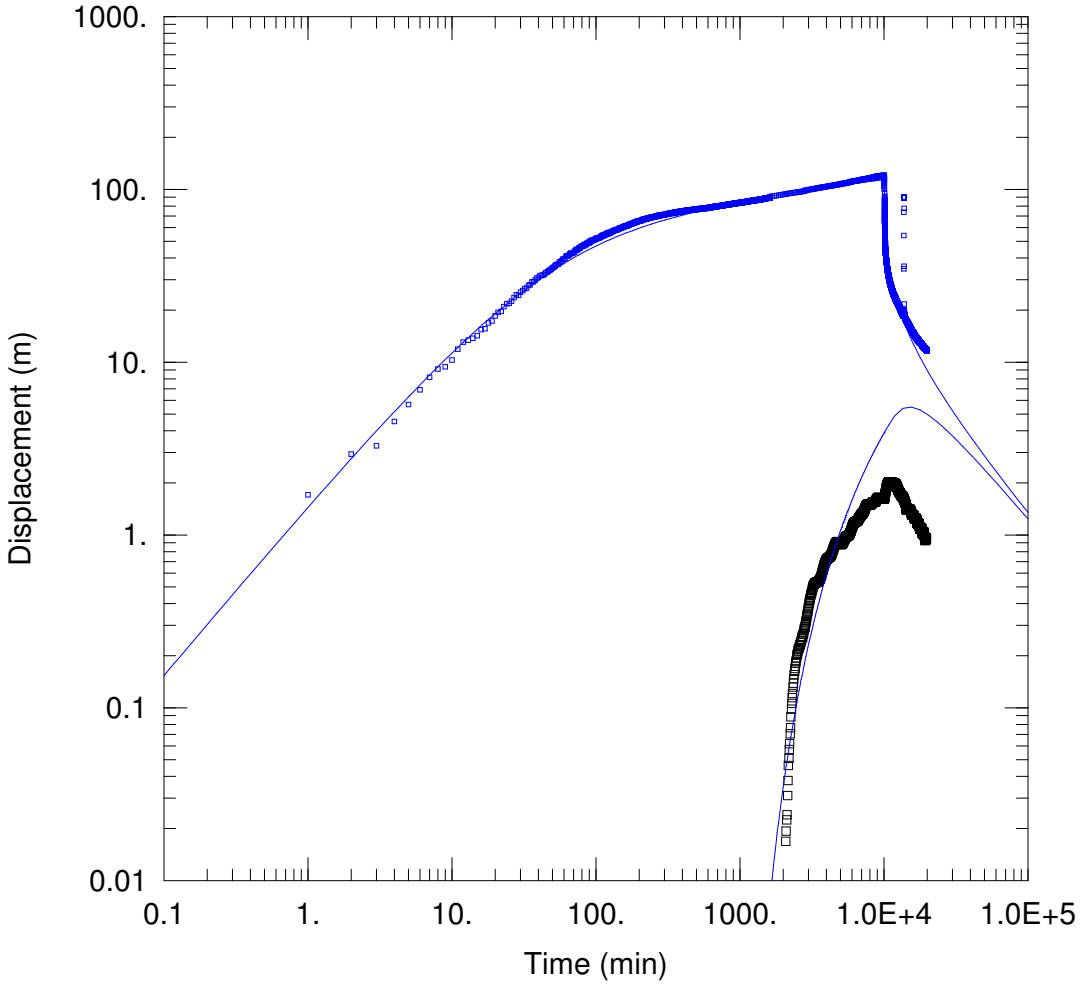

FIGURE II.6

PROJECT INFORMATION

Company: Klohn Crippen Berger
Client: KGHM Ajax Mining Inc.
Project: M09871A01
Location: Jacko Lake
Test Well: BGC10-PW01
Test Date: October 21, 2014

AQUIFER DATA

Saturated Thickness: 180.4 m

Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Pumping Wells

Well Name	X (m)	Y (m)
BGC10-PW01	683365	5609531

Observation Wells

Well Name	X (m)	Y (m)
▫ BGC10-PW01	683365	5609531
□ KAX-14-128D	683324.9	5609497

SOLUTION

Aquifer Model: Confined

Solution Method: Papadopulos-Cooper

T = 3.338E-6 m^2/sec

S = 0.002342

r(w) = 0.4863 m

r(c) = 0.08073 m

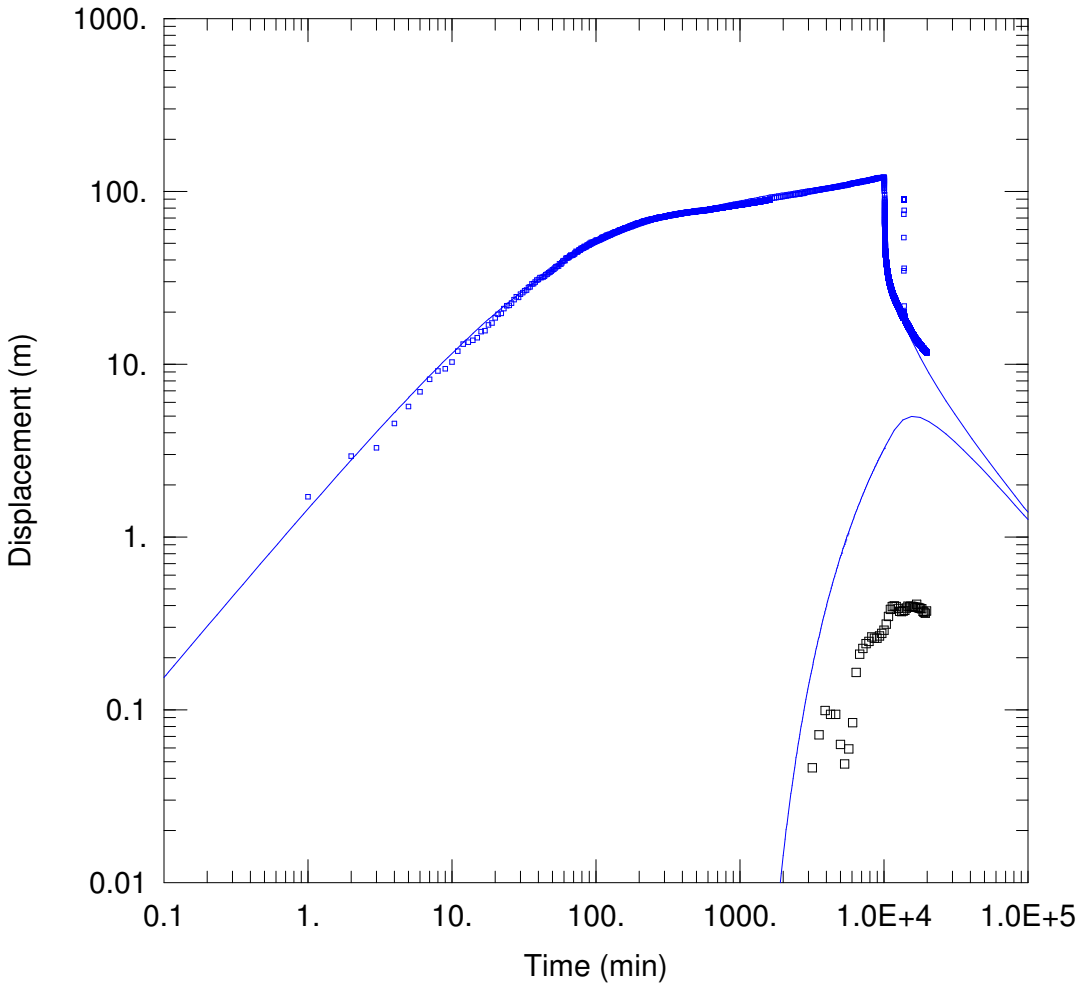

FIGURE II.7

PROJECT INFORMATION

Company: Klohn Crippen Berger
Client: KGHM Ajax Mining Inc.
Project: M09871A01
Location: Jacko Lake
Test Well: BGC10-PW01
Test Date: October 21, 2014

AQUIFER DATA

Saturated Thickness: 180.4 m

Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Pumping Wells

Well Name	X (m)	Y (m)
BGC10-PW01	683365	5609531

Observation Wells

Well Name	X (m)	Y (m)
▫ BGC10-PW01	683365	5609531
□ AJG01D	683381	5609473

SOLUTION

Aquifer Model: Confined

Solution Method: Papadopulos-Cooper

T = 3.247E-6 m^2/sec

S = 0.001998

r(w) = 0.4863 m

r(c) = 0.08073 m

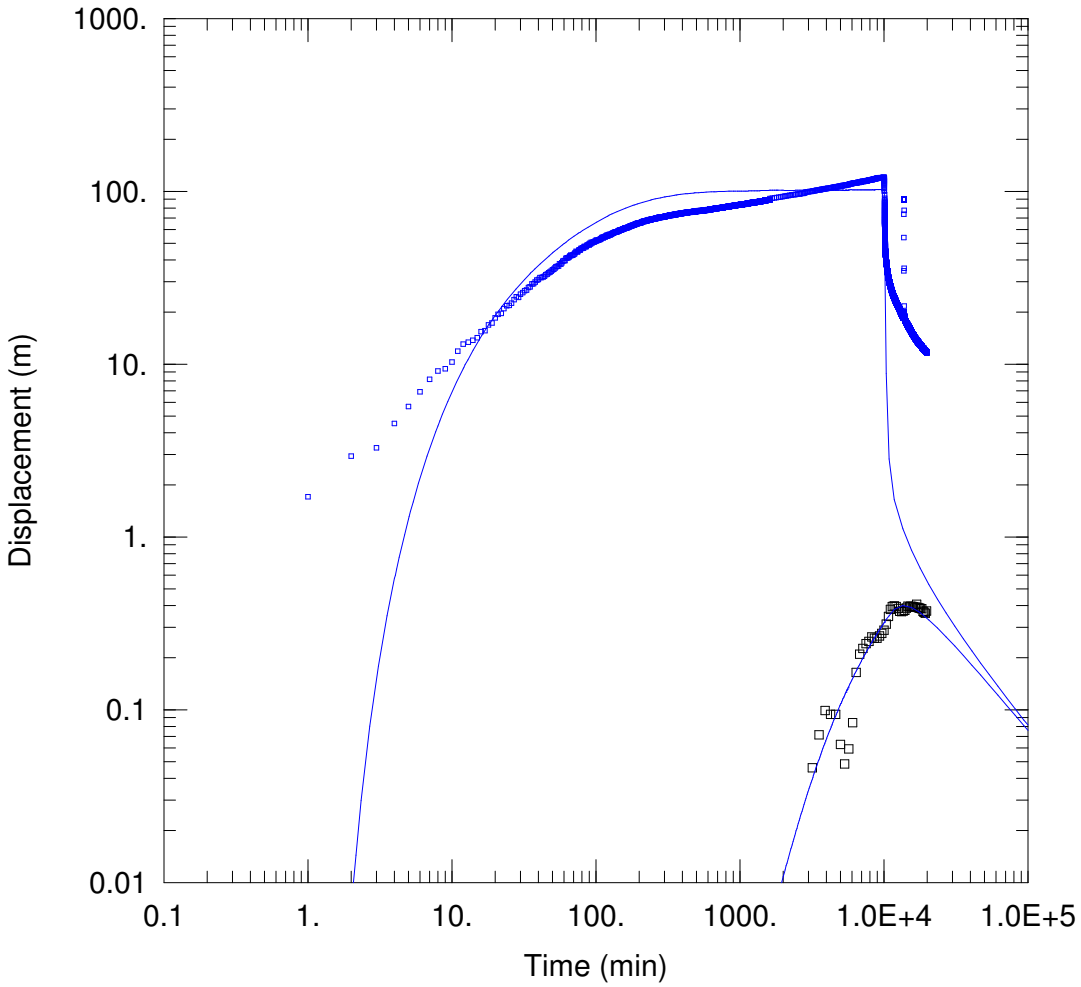

FIGURE II.8

PROJECT INFORMATION

Company: Klohn Crippen Berger
Client: KGHM Ajax Mining Inc.
Project: M09871A01
Location: Jacko Lake
Test Well: BGC10-PW01
Test Date: October 21, 2014

AQUIFER DATA

Saturated Thickness: 180.4 m
Aquitard Thickness (b'): 1. m
Anisotropy Ratio (Kz/Kr): 1.
Aquitard Thickness (b"): 1. m

WELL DATA

Pumping Wells

Well Name	X (m)	Y (m)
BGC10-PW01	683365	5609531

Observation Wells

Well Name	X (m)	Y (m)
▫ BGC10-PW01	683365	5609531
□ AJG01D	683381	5609473

SOLUTION

Aquifer Model: Leaky
Solution Method: Neuman-Witherspoon

T = 5.8E-7 m^2/sec
1/B = 1.439 m^{-1}
T2 = 5.49E-5 m^2/sec

S = 0.006943
ß/r = 0.5557 m^{-1}
S2 = 5.067E-5

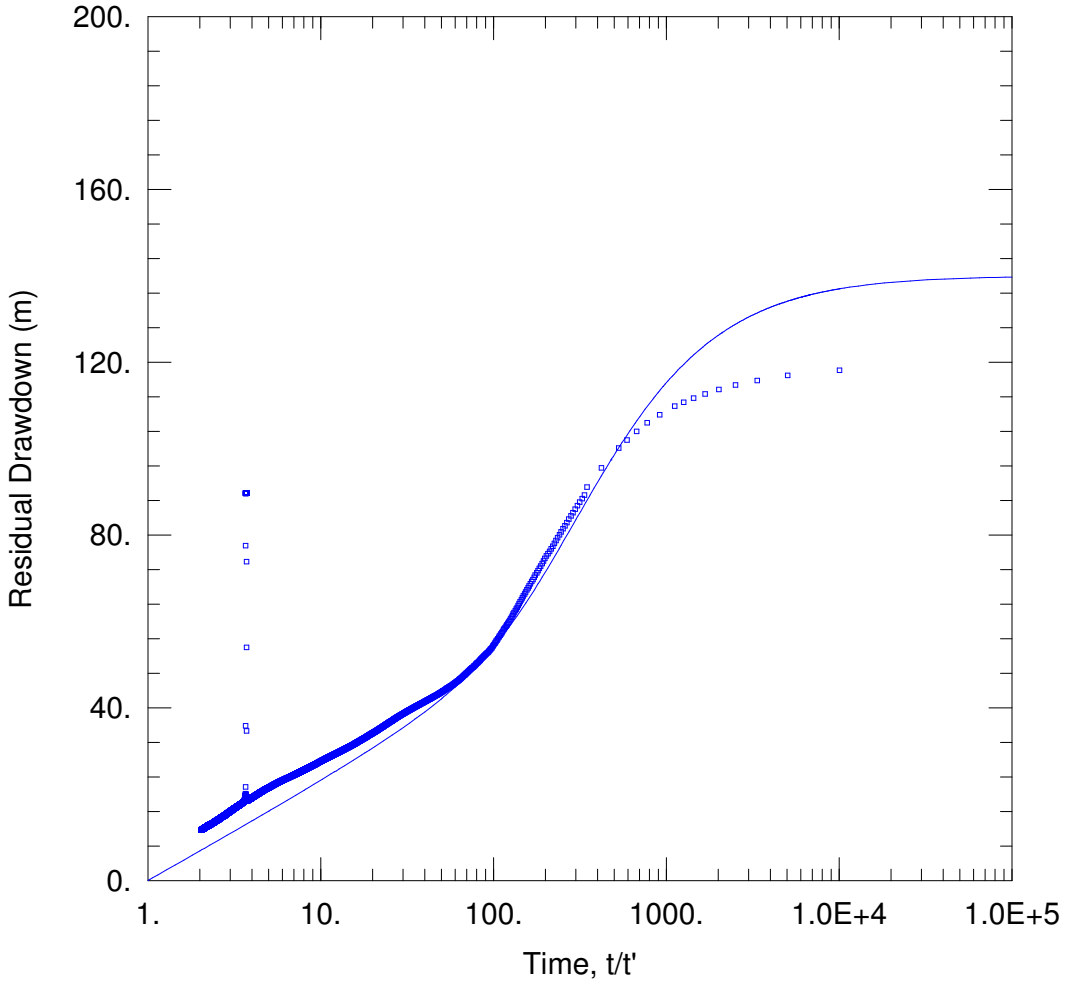

FIGURE II.9

PROJECT INFORMATION

Company: Klohn Crippen Berger
Client: KGHM Ajax Mining Inc.
Project: M09871A01
Location: Jacko Lake
Test Well: BGC10-PW01
Test Date: October 21, 2014

WELL DATA

Pumping Wells

Well Name	X (m)	Y (m)
BGC10-PW01	683365	5609531

Observation Wells

Well Name	X (m)	Y (m)
▫ BGC10-PW01	683365	5609531

SOLUTION

Aquifer Model: Unconfined

T = 4.321E-6 m^2/sec
Sy = 0.1488
Sw = 1.8
r(c) = 0.05715 m

Solution Method: Moench

S = 0.001982
ß = 10.
r(w) = 0.03523 m
alpha = 1.0E+30 min^{-1}

APPENDIX B
TEST PIT LOGS, BOREHOLE LOGS AND MONITORING WELL COMPLETION DETAILS

APPENDIX B – TEST PIT LOGS, BORHOLE LOGS AND MONITORING WELL COMPLETION DETAILS

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Logs Completed by BGC Engineering

BGC (2011) Ajax Project Feasibility Study - Plant Site, Waste Rock Storage Areas, Crushers and Explosives Storage Geotechnical Investigation: Data Report. Report prepared by BGC Engineering Inc. for Abacus Mining and Exploration Corporation, dated July 28, 2011, Doc. No.:0712-003-R01-2011……B-1

BGC (2011) Ajax Project Feasibility Study - Prototype Dewatering Well and Pumping Test. Report prepared by BGC Engineering Inc. for Abacus Mining and Exploration Corporation, dated September 10, 2011, Doc. No.:0712-003-M01-2011……B-212

BGC (2012) MEMA Support Cost Estimate (Rev.1), Proposal prepared for KGHM Ajax Mining Inc., Dated December 21, 2012……B-215

BGC (2015) Ajax Project EA – Ajax South Groundwater and Surface Water Site Investigation. Memorandum prepared by BGC Engineering Inc. for KGHM Ajax Mining Inc., dated August 26, 2015, Doc. No.:1125-007-M03-2014……B-353

BGC (2015) Ajax Project EA – Peterson Creek Aquifer Pumping Test. Report prepared by BGC Engineering Inc. for KGHM Ajax Mining Inc., dated July 31, 2015, Doc. No.:1125-007-M01-2015……..B-458

Logs Completed by Knight Piesold

KP (2007) Preliminary Groundwater Investigation. Report prepared for Abacus Mining and Exploration Corp., Afton Project, dated December 17, 2007. Ref No. VA101-246/5-2……...B-478

KP (2011) Hydrogeological Site Investigation Data Report. Report prepared for KGHM Ajax MIning Inc., dated February 27, 2012, Ref No., VA101-246/8-3……...B-501

KP (2015) Ajax Project Geotechnical Report - Tailings Storage and Mine Rock Storage Facilities. Report prepared for KGHM Ajax Mining Inc., dated May 15, 2015. Ref No. VA101-246/26-11 Rev 1……B-521

Logs Completed by Golder Associates

Golder (2011) Ajax Copper/Gold Project – Factual Report on the Geotechnical Investigation for the Tailings Storage Facility, Tailings Storage Facility Pond and Thickened Tailings Plant Areas. Report prepared for Abacus Mining and Exploration Corp., dated October 14, 2011, Doc. No. 10-9002-0032…….....B-1118

Logs Completed by Lorax Environmental

Lorax (2012) Borehole Logs LE12-01, 02, 03 and 04. Provided to Knight Piesold by Lorax Environmental Services, November 2012……B-1138

Logs Completed by Klohn Leonoff

Klohn Leonoff (1988) Ajax Mine Project Hydrogeology Study, Report prepared by Klohn Leonoff Consulting Engineers for Afton Operating Corporation, dated May 11, 1988, 94p……..B-1142

LEGEND FOR TEST HOLE LOGS

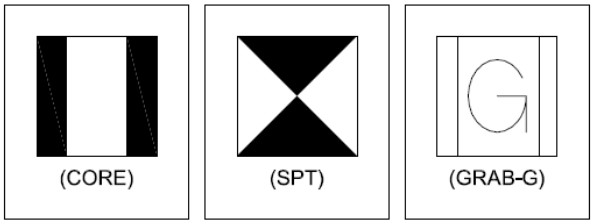
The various parameters depicted on the test hole logs are described below according to the select headings found on the form.

Depth

Depth below ground surface is measured in meters.

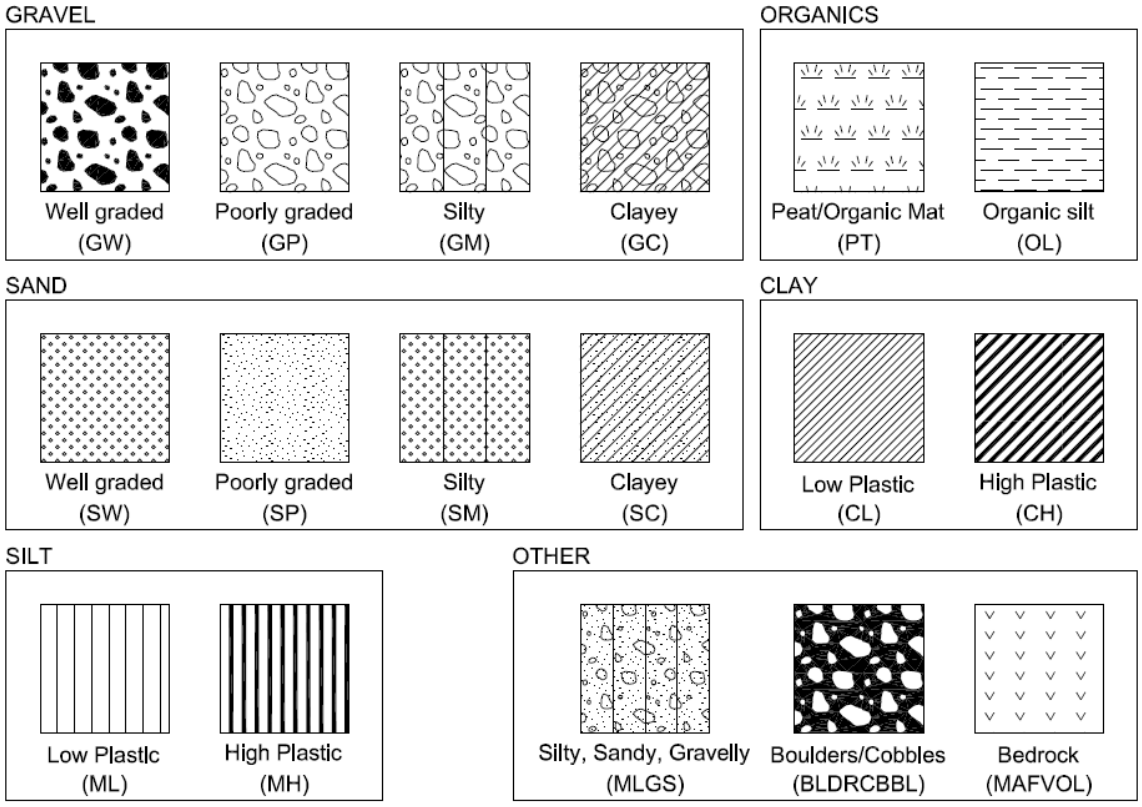
Sample Type and Sample Number

Samples are numbered and represented graphically by the symbols shown below. All samples collected from test holes are shown on the logs; however, not all of them have been tested.



Symbol

Sediment types and rock are represented graphically by the following symbols:



If a specific material is a combination of these categories, the symbol can be a mixture of any of these symbols.

Lithologic Description

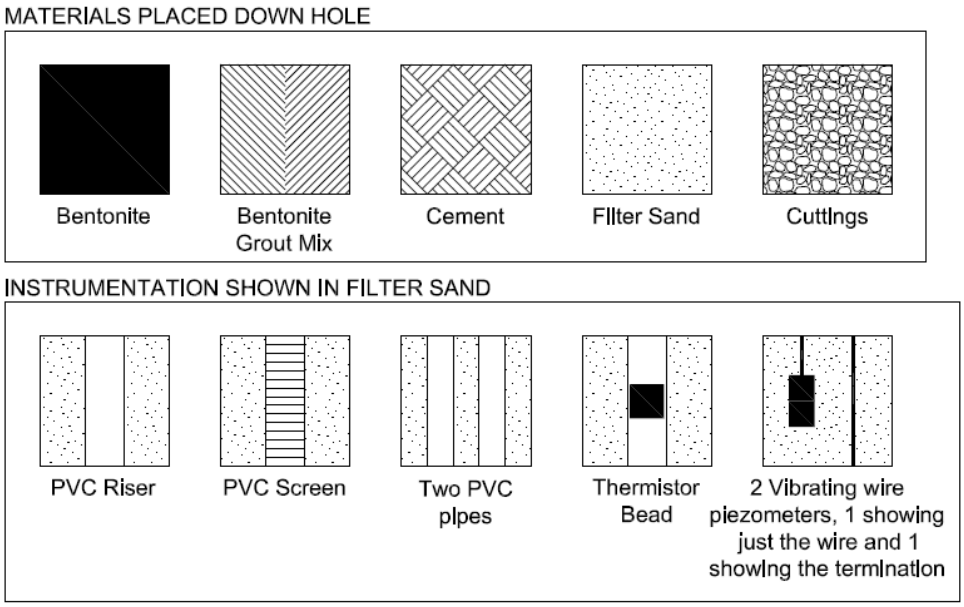
Sediments are described according to the Unified Soil Classification System (USCS). Bedrock is described according to the International Society for Rock Mechanics (ISRM 1978).

The following descriptions are typically listed for each main lithological unit on the logs: colour; grain size; hardness; moisture content; plasticity; cementation; alteration and weathering; vein and faulting characteristics; number of joint sets; typical alpha angles (i.e. angle to the core axis); if applicable, beta angles (i.e. degrees orientation line to lowest point downhole of joint); typical bedding angles; typical joint surface conditions such as shape (planar, curved, undulate, stepped and irregular), joint roughness (polished, slickensided, smooth, rough, very rough) (Barton and Choubey 1977), and Flysch rating (Marinos and Hoek 2001).

Individual representative discontinuities (joints, bedding, shears, minor faults) every 1 to 2 m and every major fault are picked out and described by (where possible) alpha and beta angle, infill type and thickness, joint surface shape and roughness and Joint Roughness Coefficient (JRC).

Instrument Details

Fill materials placed in the test holes are graphically represented by the symbols below. Some test holes have installations such as standpipe/vibrating wire piezometers and/or thermistors. These instruments are shown below in a default filter sand fill.



Core Recovery %

Core recovery is expressed as a percentage of the total length drilled or tested for each run. Recovery gives an indication of the quality of the ground being drilled or sampled and the general competency of the material.

RQD %

The Rock Quality Designation (RQD) is defined as the percentage of core recovered of intact pieces of 100 mm or more in length for the total length of core run (Deere and Deere, 1988). Only natural core breaks (i.e. joints) are considered in this calculation. Mechanical breaks due to drilling or handling are ignored.

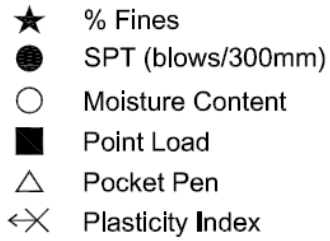
SPT Blows per 150 mm

This section gives numerical representation to the hardness of insitu ground conditions. A hammer is repeatedly dropped from a fixed elevation which drives a split spoon into the ground collecting a soil sample. The number of blows required to drive the split spoon each 150 mm, for a total length of 450 mm, are counted and recorded. An 'N-value' is calculated by adding the total blow count for the last two 150 mm segments. The 'N' value is correlated to the hardness of the soil conditions as shown in the table below. The field description is different for cohesive soils and granular soils.

	Soil Description	SPT 'N' Value	Field Test/Identification
Cohesive Soils	Very Soft	<2	Easily penetrated several inches by fist
	Soft	2 - 4	Easily penetrated several inches by thumb
	Firm	4 - 8	Can be penetrated by thumb with moderate effort
	Stiff	8 - 15	Can be penetrated by thumb but only with great effort
	Very Stiff	15 - 30	Readily indented by thumbnail
	Hard	>30	Indented with difficulty by thumbnail
Granular Soils	Very Loose	0 - 4	None
	Loose	4 - 10	Easily penetrated by 13 mm rod pushed by hand
	Compact	10 - 30	Easily penetrated by 13 mm rod driven by hammer
	Dense	30 - 50	Penetrated by 13 mm rod driven by hammer
	Very Dense	>50	Penetrated few cm's by 13 mm rod driven by hammer

Testing Results Section

This section shows the following field and lab testing results: Natural Moisture Content (%), Grain Size (% Fines – particles smaller than 0.075 mm), Pocket Penetrometer (kPa), Point Load Testing (kPa), SPT N, and Plasticity Index (%). Icons that depict the laboratory results on test logs are shown below.



Point Load Index

Point load test data from the field is converted into point load index values, also referred to as Induced Stress (Is) values (measured in MPa). This refers to adjusting stresses measured within the point load tester to stress induced in the core sample. These Is values are then converted into Is_{50} values, size correcting them to a standard 50 mm diameter core, which allows comparing point load index values of any sized core. Axial and diametral tests are indicated by different symbols, as depicted on the logs.

UCS Grade

The Unconfined Compressive Strength (UCS) Grade, (also known as field hardness), is based on simple mechanical tests, which are performed in the field using a rock hammer, pocket knife, and fingernail. The grades vary from extremely strong (Grade R6) to extremely weak (Grade R0), as shown in below. If the rock has undergone sufficient weathering or alteration such that the core has converted to soil, soil hardness grades are used.

UCS Grades for Rock and Soil Hardness (CFEM 2006)

	Grade	Description	Field Identification	UCS (MPa)	Point Load Index (MPa)
Rock Hardness	R6	Extremely Strong	Specimen can only be chipped with flat end of geological hammer.	>250	>10
	R5	Very Strong	Specimen requires many blows with flat end of geological hammer to fracture.	100-250	4-10
	R4	Strong	Specimen requires more than one blow of flat end of geological hammer to fracture.	50-100	2-4
	R3	Medium Strong	Cannot be scraped or peeled with pocket knife; can be fracture with single firm blow of flat end of geological hammer.	25-50	1-2
	R2	Weak	Can be peeled by a pocket knife with difficulty; shallow indentation made by firm blow with point of geological hammer.	5-25	-
	R1	Very Weak	Crumbles under firm blows with point of geological hammer.	1-5	-
	R0	Extremely Weak	Indented by thumbnail.	<1	-

	Grade	Description	Field Identification	SPT N Value	
Soil Hardness	S6	Hard	Indented with difficulty by thumbnail.	>30	-
	S5	Very Stiff	Readily indented by thumbnail.	15-30	-
	S4	Stiff	Readily indented by thumb but penetrated only with great effort.	8-15	-
	S3	Firm	With moderate effort, penetrates several centimeters by thumb.	4-8	-
	S2	Soft	Easily penetrated several centimeters by thumb.	2-4	-
	S1	Very Soft	Easily penetrated several centimeters by fist.	<2	-

Weathering Grade

Weathering and alteration of the rock mass is described according to Bieniawski 1976 parameters defined below.

Alteration and Weathering Rating (Bieniawski 1976)

Degree of Alteration/Weathering	Description	Rating
Fresh	Alteration may result in an improvement in rock competency (e.g. silicification)	W1
Slightly Weathered/Altered	Rock strength unchanged; weathering on joints only	W2
Moderately Weathered/Altered	Rock is discoloured but rock strength only slightly affected; discontinuities are weathered	W3
Highly Weathered/Altered	Rock is discoloured and strength is significantly reduced by weathering	W4
Completely Weathered/Altered	Original fabric and relict structures remain but rock is decomposed and friable	W5
Residual Soil	Original Fabric destroyed	W6

Note: If alteration/weathering is > W4 or UCS grade ≤R0, then RQD is 0% for that section. Also, if the UCS grade ≤R0, the number of discontinuities is recorded as the default 99.

Survey Method : Handheld GPS
Co-ordinates (m) : 682,959.E, 5,610,698.N
Ground Elevation (m) : 907
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : B-47
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/SPT/Diamond
Core : HQ3
Fluid : water
Casing : HW **Cased To (m)** : 5.80

Start Date : 13 Dec 10
Finish Date : 15 Dec 10
Final Depth of Hole (m): : 16.0
Depth to Top of Rock (m) : 5.79
Logged by : AR
Reviewed by : HWN

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details	DCT Blows per 300mm	SPT Blows per 150mm
0		M1		SILT (OL) Non plastic, stiff, brown, organic odour, dry to moist, homogeneous, trace roots. [TOPSOIL]			3 6 7
1		M2		SILT (ML) Clayey, trace gravel, low plasticity, stiff to very stiff, brown, no odour, moist, no structure, weak to moderate cementation, no to slow dilatancy, trace oxidation staining. [TILL]			6 6 7
		M3					6 5 6
2		M4		2.13 m - Grain Size Analysis: 1% Gravel, 6% Sand, 76% Silt, 17% Clay			3 6 6
3		M5					3 7 10
4		M6		3.65 m - some gravel. 3.65 m - Grain Size Analysis: 23% Gravel, 20% Sand, 34% Silt, 23% Clay			5 6 7
		M7					4 7 6
5							
6				Rock encountered at 5.79 m depth. See DH-BGC10-ND-01 rock log.			
7							
8							

Su - kPa: 40, 80, 120, 160
VANE PEAK / FIELD ◆ / LAB ■
REMOLD ◇ / □
▲ UC/2
△ Pocket Pen /2
★ % Fines
Hydraulic Conductivity (m/sec) 10^{-8} 10^{-6} 10^{-4} 10^{-2}
DCT (blows/300mm)
● SPT (blows/300mm)
Core Recovery: 20, 40, 60, 80
Moisture Content & SPT N
W_P% W% W_L%: 20, 40, 60, 80

PROJECT: Ajax Project Feasibility Study

PROJECT NO. : 0712-003

DRILL HOLE # DH-BGC10-ND-01

CO-ORDINATES : 682,959.E, 5,610,698.N
GROUND ELEVATION (m) : 907
SURVEY METHOD :Handheld GPS
DATUM : NAD83
PLUNGE (°) : 90
TREND (°) : -

DRILL DESIGNATION : B-47
DRILLING CONTRACTOR : Geotech Drilling
DRILL METHOD : ODEX/SPT/Diamond
CORE SIZE : HQ3
FLUID : water
CASED TO (m): 5.80

START DATE : 13 Dec 10
FINISH DATE : 15 Dec 10
FINAL DEPTH (m) : 16.0
DEPTH TO TOP OF ROCK (m) : 5.8
LOGGED BY : AR
REVIEWED BY : HWN

DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % / RQD % (20 40 60 80)	WEATHERING GRADE (2 3 4 5)	POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / STRENGTH GRADE (R) R1 R2 R3 R4 R5	FRACTURE FREQUENCY (FF/M) (10 20 30 40)	Joint Condition (Jc) (5 10 15 20)	RMR (20 40 60 80)	DEPTH (m)
0										0
1										1
2										2
3			0 to 5.79 m - See DH-BGC10-ND-01 soil log.							3
4										4
5										5
6		V V	BEDROCK Intrusive, light grey with some green, medium grained, massive, medium strong (R3), slightly weathered (W2), two joint sets (30°-35°, 50-60° from core axis), joint surfaces are moderately strong, close spacing, little infill, planar, some chlorite and epidote, quartz and calcite veins throughout, contains magnetic black minerals, some oxidized red minerals. [IRON MASK HYBRID]							6
7		V V								7
8		V V								8

(CONTINUED ON NEXT PAGE)

CLIENT: Abacus Mining and Exploration Corporation

PRINT DATE: : 7/26/2011

PROJECT: Ajax Project Feasibility Study

PROJECT NO. : 0712-003

DRILL HOLE # DH-BGC10-ND-01

CO-ORDINATES : 682,959.E, 5,610,698.N
GROUND ELEVATION (m) : 907
SURVEY METHOD :Handheld GPS
DATUM : NAD83
PLUNGE (°) : 90
TREND (°) : -

DRILL DESIGNATION : B-47
DRILLING CONTRACTOR : Geotech Drilling
DRILL METHOD : ODEX/SPT/Diamond
CORE SIZE : HQ3
FLUID : water
CASED TO (m): 5.80

START DATE : 13 Dec 10
FINISH DATE : 15 Dec 10
FINAL DEPTH (m) : 16.0
DEPTH TO TOP OF ROCK (m) : 5.8
LOGGED BY : AR
REVIEWED BY : HWN

DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % / RQD % (20 40 60 80) | WEATHERING GRADE (2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / STRENGTH GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (10 20 30 40) | Joint Condition (Jc) (5 10 15 20) | RMR (20 40 60 80) | DEPTH (m)

8.3 to 8.45 m - Microfractures

8.67 to 9.24 m - Broken rock, 5 cm blocks

10.47 m - Fault, 160 mm aperture, broken and crushed rock

12.4 m - Colour changes to green.

14.65 m - Colour changes to light grey.

15.33 to 15.67 m - Microfractured

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CLIENT: Abacus Mining and Exploration Corporation

PRINT DATE: : 7/26/2011

DRILL HOLE # DH-BGC10-ND-01

CO-ORDINATES : 682,959.E, 5,610,698.N
GROUND ELEVATION (m) : 907
SURVEY METHOD :Handheld GPS
DATUM : NAD83
PLUNGE (°) : 90
TREND (°) : -

DRILL DESIGNATION : B-47
DRILLING CONTRACTOR : Geotech Drilling
DRILL METHOD : ODEX/SPT/Diamond
CORE SIZE : HQ3
FLUID : water
CASED TO (m): 5.80

START DATE : 13 Dec 10
FINISH DATE : 15 Dec 10
FINAL DEPTH (m) : 16.0
DEPTH TO TOP OF ROCK (m) : 5.8
LOGGED BY : AR
REVIEWED BY : HWN

DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % / RQD % (20 40 60 80)	WEATHERING GRADE (2 3 4 5)	POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / STRENGTH GRADE (R) R1 R2 R3 R4 R5	FRACTURE FREQUENCY (FF/M) (10 20 30 40)	Joint Condition (Jc) (5 10 15 20)	RMR (20 40 60 80)	DEPTH (m)
16			END OF HOLE AT 16.00 m Notes: 1. Drill hole backfilled with bentonite chips 2. All SPT's completed using autotrip hammer weighing 140lbs dropped from 30 inches 3. Elevation was extracted from DEM							16
17										17
18										18
19										19
20										20
21										21
22										22
23										23
24										24

CLIENT: Abacus Mining and Exploration Corporation
PRINT DATE: : 7/26/2011

Survey Method : Handheld GPS
Co-ordinates (m) : 684,183.E, 5,611,125.N
Ground Elevation (m) : 981
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : B-41 / B-54
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/SPT
Core :
Fluid : water
Casing : HW **Cased To (m)** :

Start Date : 15 Dec 10
Finish Date : 21 Dec 10
Final Depth of Hole (m): : 33.3
Depth to Top of Rock (m) :
Logged by : AR
Reviewed by : HWN

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description
0		M1		SAND (SM) and GRAVEL Fine grained, silty, well graded, dense, maximum particle size 40 mm, subrounded, brown, slight organic odour, dry, homogeneous, no cementation, trace grass roots. [TOPSOIL]
1		M2		GRAVEL (GM) and SILT and SAND well graded, dense, maximum particle size 40 mm, subrounded, brown, no odour, dry to moist, homogeneous, weak to moderate cementation. [TILL]
2		M3		
3		M4		
4		M5		3.65 m - Grain Size Analysis: 27% Gravel, 32% Sand, 41% Fines
5		M6		
6		M7		SILT (ML) Sandy (fine), some gravel to gravelly, some clay, low plasticity, very stiff, brown, no odour, moist, no structure, weak to moderate cemenation, no to slow dilatency. [TILL]
7		M8		
8		M9		6.70 m - Grain Size Analysis: 21% Gravel, 30% Sand, 31% Silt, 18% Clay
		M10		

Instrument Details

DCT Blows per 300mm

SPT Blows per 150mm: 4, 15, 9 | 18, 26, 31 | 13, 14, 24 | 11, 15, 18 | 9, 10, 15 | 10, 12, 14 | 7, 10, 12 | 8, 9, 11 | 6, 6, 9 | 6, 10, 12

Su - kPa (40, 80, 120, 160)
VANE PEAK REMOLD; FIELD ◆ ◇; LAB ■ □
UC/2 ▲
Pocket Pen /2 △
DCT (blows/300mm)
SPT (blows/300mm) ●
★ % Fines
Hydraulic Conductivity (m/sec) 10^{-8} 10^{-6} 10^{-4} 10^{-2}
Core Recovery (20, 40, 60, 80)
Moisture Content & SPT N
W_P% W% W_L% (20, 40, 60, 80)

(Continued on next page)

Survey Method : Handheld GPS
Co-ordinates (m) : 684,183.E, 5,611,125.N
Ground Elevation (m) : 981
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : B-41 / B-54
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/SPT
Core :
Fluid : water
Casing : HW **Cased To (m)** :

Start Date : 15 Dec 10
Finish Date : 21 Dec 10
Final Depth of Hole (m): : 33.3
Depth to Top of Rock (m) :
Logged by : AR
Reviewed by : HWN

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details	DCT Blows per 300mm	SPT Blows per 150mm
8							
		M11					10 10 12
9		M12					6 8 12
		M13					5 9 11
10		M14					6 11 15
11		M15		SAND (SM) and SILT Fine to medium grained, gravelly, some clay, moderately to well graded, compact to dense, maximum particle size 40 mm, subrounded, brown, no odour, moist, homogeneous, moderate cementation. [TILL]			15 15 20
12		M16		12.5 m - Water noted on sampler			9 14 20
13		M17					7 13 20
		M18					10 13 20
14		M19					9 15 21
15		M20					9 16 21
16							11

Su - kPa: 40, 80, 120, 160
VANE PEAK / REMOLD — FIELD ◆ ◇ — LAB ■ □
▲ UC/2
△ Pocket Pen /2
★ % Fines
Hydraulic Conductivity (m/sec) 10^{-8} 10^{-6} 10^{-4} 10^{-2}
DCT (blows/300mm)
SPT (blows/300mm)
Core Recovery 20 40 60 80
Moisture Content & SPT N
W_P% W% W_L% 20 40 60 80

(Continued on next page)

Survey Method : Handheld GPS
Co-ordinates (m) : 684,183.E, 5,611,125.N
Ground Elevation (m) : 981
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : B-41 / B-54
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/SPT
Core :
Fluid : water
Casing : HW **Cased To (m)** :

Start Date : 15 Dec 10
Finish Date : 21 Dec 10
Final Depth of Hole (m): : 33.3
Depth to Top of Rock (m) :
Logged by : AR
Reviewed by : HWN

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details	DCT Blows per 300mm	SPT Blows per 150mm
16		M21		15.85 m - Grain Size Analysis: 21% Gravel, 39% Sand, 40 % Fines			16 17
		M22					8 10 17
17		M23					7 10 18
18		M24					7 11 15
19		M25					7 14 21
		M26					8 11 14
20							
21							
22							
		M27					8 12 16
23							
24							

Su - kPa: 40, 80, 120, 160
VANE PEAK / REMOLD — FIELD ◆ ◇ — LAB ■ □
★ % Fines
Hydraulic Conductivity (m/sec) 10^{-8} 10^{-6} 10^{-4} 10^{-2}
Core Recovery: 20, 40, 60, 80
▲ UC/2
△ Pocket Pen /2
DCT (blows/300mm)
● SPT (blows/300mm)
Moisture Content & SPT N
W_P% W% W_L%: 20, 40, 60, 80

(Continued on next page)

Survey Method : Handheld GPS
Co-ordinates (m) : 684,183.E, 5,611,125.N
Ground Elevation (m) : 981
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : B-41 / B-54
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/SPT
Core :
Fluid : water
Casing : HW **Cased To (m)** :

Start Date : 15 Dec 10
Finish Date : 21 Dec 10
Final Depth of Hole (m): : 33.3
Depth to Top of Rock (m) :
Logged by : AR
Reviewed by : HWN

Depth (m)	Sample Type	Sample No.	Lithologic Description
24		M28	
25			SILT (ML) and SAND Clayey, some gravel, low plasticity, very stiff, brown, no odour, moist, no structure, moderate cementation, no dilatancy. [TILL]
26		M29	25.75 m - Grain Size Analysis: 12% Gravel, 39% Sand, 49% Fines
27		M30	SAND (SM) and SILT Fine to medium grained, gravelly, some clay, well graded, dense, maximum particle size 25 mm, subrounded, brown, no odour, moist, homogeneous, moderate cementation. [TILL]
28			
29		M31	SILT (ML) Some clay, some fine sand, some gravel, low plasticity, very stiff, moist, no structure, moderate cementation, no dilatancy. [TILL]
30			SAND (SM) and SILT Fine grained, gravelly, some clay, moderately to well graded, compact, maximum particle size 40 mm, subrounded, brown, no odour, moist, homogeneous, moderate cementation. [TILL]
31		M32	
32		M33	SILT (ML) and SAND Gravelly, some clay, low plasticity, very stiff, brown, no odour, moist, no structure, moderate cementation, no dilatancy, trace oxidation stains. [TILL] 31.70 m - Grain Size Analysis: 27% Gravel, 38% Sand, 35% Fines

Instrument Details

DCT Blows per 300mm

SPT Blows per 150mm: 11, 20, 22 | 11, 8, 12 | 7, 15, 21 | 5, 15, 13 | 8, 15, 13 | 12, 29

Su - kPa: 40, 80, 120, 160
VANE PEAK / REMOLD — FIELD ◆ ◇ — LAB ■ □
UC/2 ▲
Pocket Pen /2 △
DCT (blows/300mm)
SPT (blows/300mm) ●
★ % Fines
Hydraulic Conductivity (m/sec) 10^{-8} 10^{-6} 10^{-4} 10^{-2}
Core Recovery: 20, 40, 60, 80
Moisture Content & SPT N: W_P% W% W_L%: 20, 40, 60, 80

(Continued on next page)

Survey Method : Handheld GPS
Co-ordinates (m) : 684,183.E, 5,611,125.N
Ground Elevation (m) : 981
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : B-41 / B-54
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/SPT
Core :
Fluid : water
Casing : HW **Cased To (m)** :

Start Date : 15 Dec 10
Finish Date : 21 Dec 10
Final Depth of Hole (m): : 33.3
Depth to Top of Rock (m) :
Logged by : AR
Reviewed by : HWN

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details	DCT Blows per 300mm	SPT Blows per 150mm
32							34
33		M34					11 19 31
				END OF HOLE AT 33.25 m (could not advance casing - equipment problems)			

Notes:
1. Hole abandoned due to difficulty advancing casing
2. All SPT's completed using autotrip hammer weighing 140lbs dropped from 30 inches.
3. Drill hole backfilled with bentonite chips
4. Elevation was extracted from DEM

Su - kPa: 40, 80, 120, 160
VANE / PEAK / REMOLD — FIELD ◆ ■ — LAB ◇ □
▲ UC/2 — △ Pocket Pen /2
★ % Fines
Hydraulic Conductivity (m/sec): 10^{-8} 10^{-6} 10^{-4} 10^{-2}
DCT (blows/300mm) — SPT (blows/300mm) ●
Core Recovery: 20 40 60 80
Moisture Content & SPT N: W_P% W% W_L%: 20 40 60 80

Survey Method : Handheld GPS
Co-ordinates (m) : 684,007.E, 5,611,393.N
Ground Elevation (m) : 985
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : B-54
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/SPT/Diamond
Core : HQ3
Fluid : water
Casing : HW **Cased To (m)** : 36.60

Start Date : 08 Jan 11
Finish Date : 16 Jan 11
Final Depth of Hole (m): : 51.5
Depth to Top of Rock (m) : 35.00
Logged by : AR
Reviewed by : HWN

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details	DCT Blows per 300mm	SPT Blows per 150mm
0				SILT (ML) Some gravel, non plastic, firm to stiff, brown, organic odour, dry to moist, no structure, no to weak cementation, some roots. [TOPSOIL]			
1				SAND (SM) Fine to medium sized, some silt to silty, some gravel, well graded, compact, maximum particle size 40 mm, subrounded, brown, no odour, dry to moist, homogeneous, no to weak cementation. [TILL]			
2		M1					11 14 14
3		M2		3.0 m - becomes silty 3.05 m - Grain Size Analysis: 18% Gravel, 35% Sand, 47% Fines			6 12 13
4							
5		M3		GRAVEL (GM) and SILT And silt, some fine to medium sand, trace clay, moderately to well graded, compact, maximum particle size 40 mm, subrounded, brown, no odour, moist, homogeneous, moderate cementation. [TILL]			4 8 13
6		M4		SILT (ML) and SAND Clayey, some gravel, low plasticity, stiff to very stiff, brown, no odour, moist, no structure, moderate cementation. [TILL]			4 7 8
7							
8		M5		7.5 m - some clay, sandy (fine to medium)			4 8 10

Su - kPa
40 80 120 160
VANE FIELD LAB
PEAK ◆ ■
REMOLD ◇ □
▲ UC/2
△ Pocket Pen /2
★ % Fines
Hydraulic Conductivity (m/sec)
10^{-8} 10^{-6} 10^{-4} 10^{-2}
DCT (blows/300mm)
● SPT (blows/300mm)
Core Recovery
20 40 60 80
Moisture Content & SPT N
W_P% W% W_L%
20 40 60 80

(Continued on next page)

Survey Method : Handheld GPS
Co-ordinates (m) : 684,007.E, 5,611,393.N
Ground Elevation (m) : 985
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : B-54
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/SPT/Diamond
Core : HQ3
Fluid : water
Casing : HW **Cased To (m)** : 36.60

Start Date : 08 Jan 11
Finish Date : 16 Jan 11
Final Depth of Hole (m): : 51.5
Depth to Top of Rock (m) : 35.00
Logged by : AR
Reviewed by : HWN

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details	DCT Blows per 300mm	SPT Blows per 150mm
8							
9		M6		9.0 m - clayey, some sand (fine to medium) 9.15 m - Grain Size Analysis: 11% Gravel, 39% Sand, 35% Silt, 15% Clay			3 6 8
10							
11		M7					3 5 8
12							
13		M8					4 7 10
14		M9		SAND (SM) and SILT Fine to medium grained, some gravel, trace clay, well graded, compact, maximum particle size 25 mm, subrounded, brown, no odour, moist, homogeneous, moderate cementation, slow dilatancy. [TILL]			4 8 11
15		M10		GRAVEL (GM) and SAND Fine to medium grained, silty, well graded, compact to dense, maximum particle size 40 mm, subrounded, brown, no odour, moist, homogeneous, weak to moderate cementation, slow dilatancy. [TILL] 15.2 m - Grain Size Analysis: 23% Gravel, 32% Sand, 45% Fines			6 17 20
16							

Su - kPa: 40, 80, 120, 160
VANE PEAK / REMOLD — FIELD ◆ ◇ — LAB ■ □
UC/2 ▲ — Pocket Pen /2 △
★ % Fines
Hydraulic Conductivity (m/sec) 10^{-8} 10^{-6} 10^{-4} 10^{-2}
DCT (blows/300mm)
SPT (blows/300mm) ●
Core Recovery 20 40 60 80
Moisture Content & SPT N
W_P% W% W_L% 20 40 60 80

(Continued on next page)

Survey Method : Handheld GPS
Co-ordinates (m) : 684,007.E, 5,611,393.N
Ground Elevation (m) : 985
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : B-54
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/SPT/Diamond
Core : HQ3
Fluid : water
Casing : HW **Cased To (m)** : 36.60

Start Date : 08 Jan 11
Finish Date : 16 Jan 11
Final Depth of Hole (m): : 51.5
Depth to Top of Rock (m) : 35.00
Logged by : AR
Reviewed by : HWN

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details	DCT Blows per 300mm	SPT Blows per 150mm
16							
17		M11		17.0 m - Sand is fine to coarse, medium dilatancy			11 15 18
18		M12					50 R
19				GRAVEL (GP) Some silt, some sand, angular chips, greenish grey and some oxidation, moist, some cemented chunks, SPT refusal. [POSSIBLY HIGHLY WEATHERED ROCK]			
20		M13					50 R
21							
22		M14					50 R
23		M15					50 R
24							

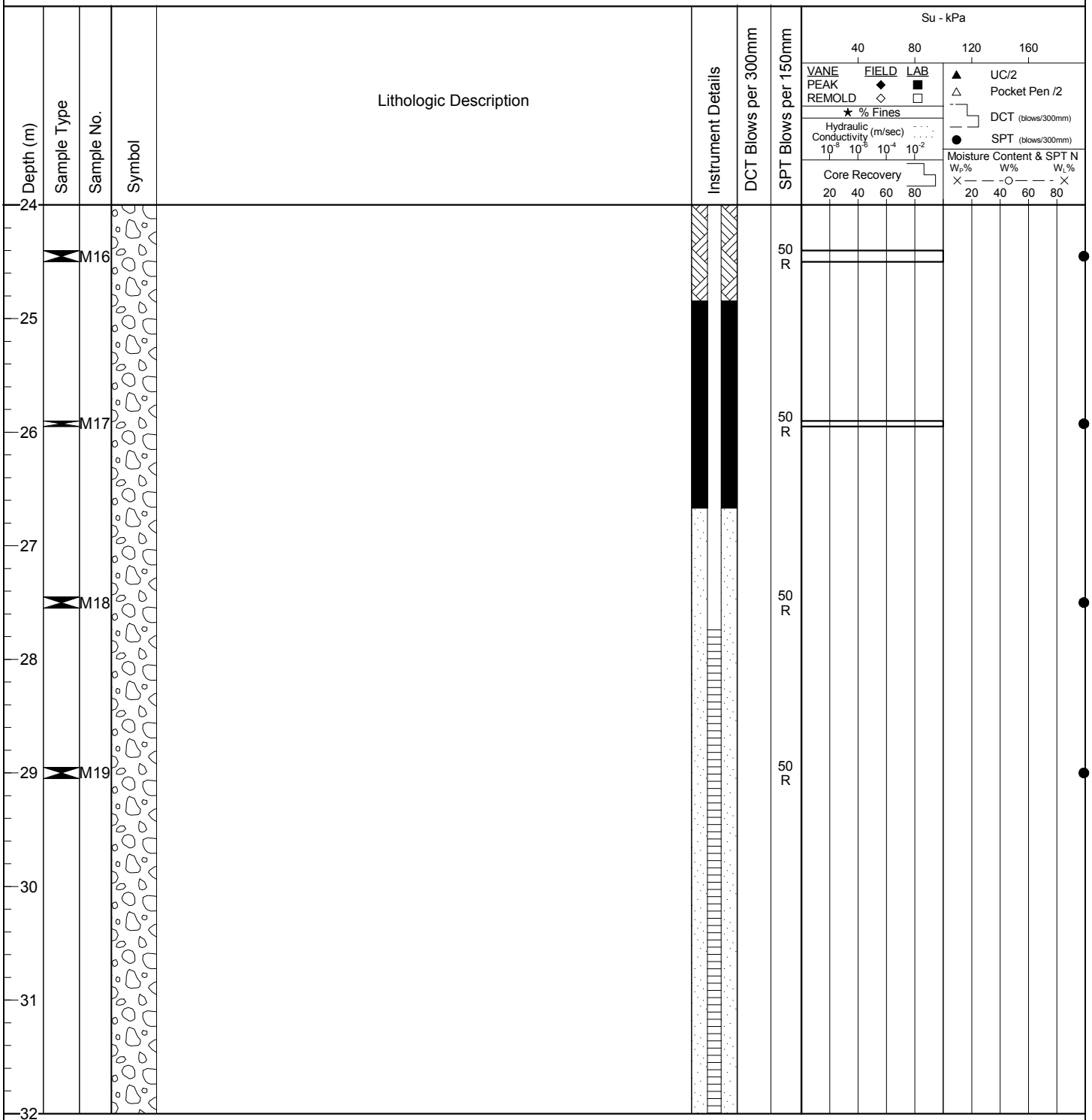
Su - kPa: 40, 80, 120, 160
VANE / PEAK / REMOLD — FIELD ◆ ■ ◇ □ — LAB
▲ UC/2
△ Pocket Pen /2
★ % Fines
Hydraulic Conductivity (m/sec) 10^{-8} 10^{-6} 10^{-4} 10^{-2}
DCT (blows/300mm)
● SPT (blows/300mm)
Core Recovery 20 40 60 80
Moisture Content & SPT N: W_P% W% W_L% 20 40 60 80

(Continued on next page)

Survey Method : Handheld GPS
Co-ordinates (m) : 684,007.E, 5,611,393.N
Ground Elevation (m) : 985
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : B-54
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/SPT/Diamond
Core : HQ3
Fluid : water
Casing : HW **Cased To (m)** : 36.60

Start Date : 08 Jan 11
Finish Date : 16 Jan 11
Final Depth of Hole (m): : 51.5
Depth to Top of Rock (m) : 35.00
Logged by : AR
Reviewed by : HWN



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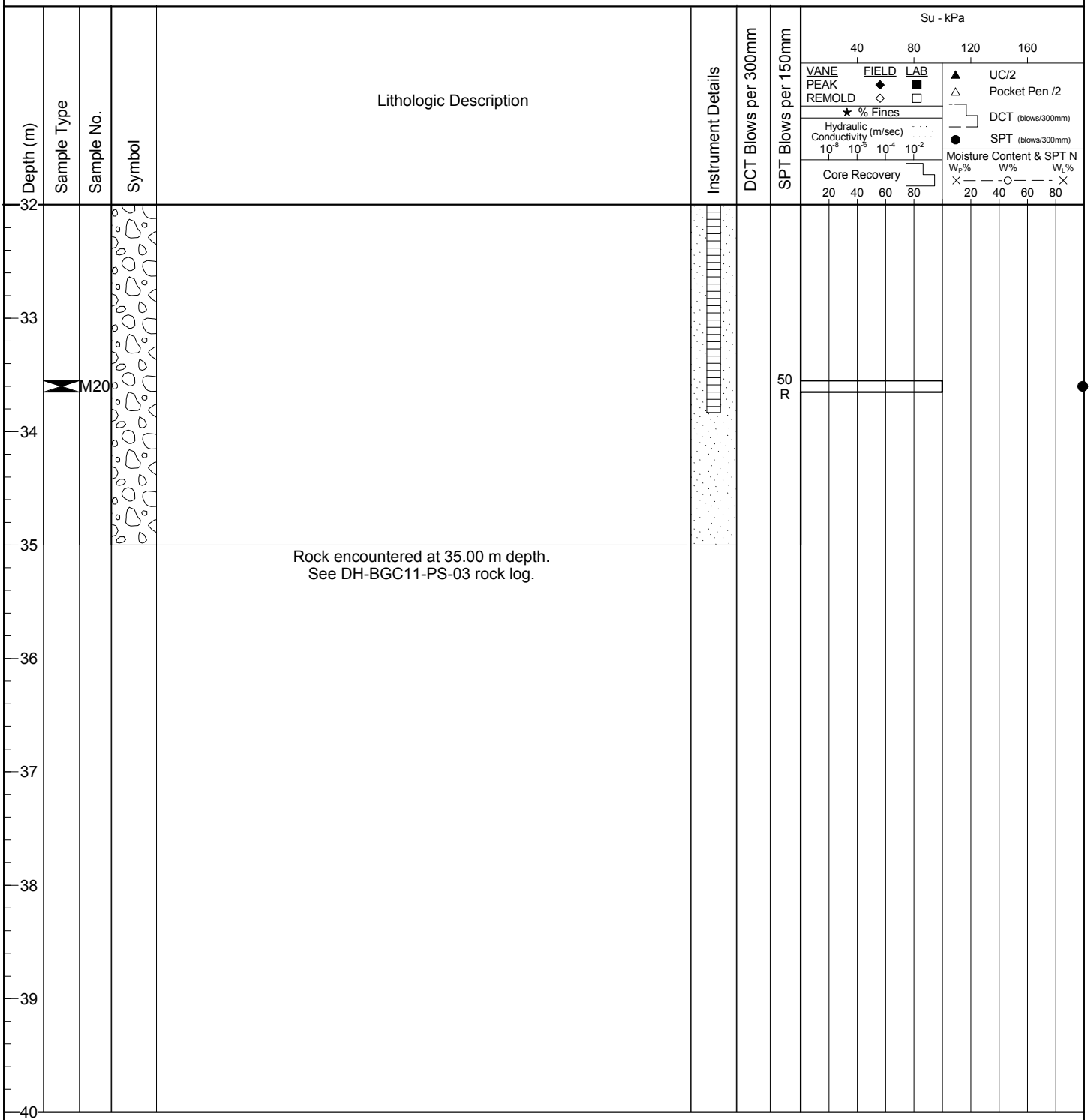
Survey Method : Handheld GPS
Co-ordinates (m) : 684,007.E, 5,611,393.N
Ground Elevation (m) : 985
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : B-54
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/SPT/Diamond
Core : HQ3
Fluid : water
Casing : HW **Cased To (m)** : 36.60

Start Date : 08 Jan 11
Finish Date : 16 Jan 11
Final Depth of Hole (m): : 51.5
Depth to Top of Rock (m) : 35.00
Logged by : AR
Reviewed by : HWN



BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: Abacus Mining and Exploration Corporation

AJAX (SOIL) AJAX_SOIL.GDL BGC.GDT 7/26/11

DRILL HOLE # DH-BGC11-PS-03

CO-ORDINATES : 684,007.E, 5,611,393.N
GROUND ELEVATION (m) : 985
SURVEY METHOD :Handheld GPS
DATUM : NAD83
PLUNGE (°) : 90
TREND (°) : -

DRILL DESIGNATION : B-54
DRILLING CONTRACTOR : Geotech Drilling
DRILL METHOD : ODEX/SPT/Diamond
CORE SIZE : HQ3
FLUID : water
CASED TO (m): 36.6

START DATE : 08 Jan 11
FINISH DATE : 16 Jan 11
FINAL DEPTH (m) : 51.5
DEPTH TO TOP OF ROCK (m) : 35.0
LOGGED BY : AR
REVIEWED BY : HWN

DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % / RQD % (20 40 60 80)	WEATHERING GRADE (2 3 4 5)	POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / STRENGTH GRADE (R) R1 R2 R3 R4 R5	FRACTURE FREQUENCY (FF/M) (10 20 30 40)	Joint Condition (Jc) (5 10 15 20)	RMR (20 40 60 80)	DEPTH (m)
32										32
33			0 to 35.00 m - See DH-BGC11-PS-03 soil log.							33
34										34
35			BEDROCK Intrusive, greenish grey, some pinkish red with grey, medium grained, microfractured, medium strong (R3), slightly to moderately weathered (W2-W3), two to three joint sets (25-40°, 45-50°, 60-70° from core axis), joint surfaces are moderately strong, close spacing, little infill, planar, quartz veins throughout, some magnetic minerals. [IRON MASK HYBRID]							35
36										36
37			37.22 to 37.34 m - Fault, 120 mm aperture, fault gouge, wall alpha angles = 50° 37.45 to 37.52 m - Fault, 70 mm aperture, broken rock, wall alpha angles = 50°							37
38			37.8 - 38.7 m - Broken Rock, 5 cm blocks							38
39										39
40										40

(CONTINUED ON NEXT PAGE)

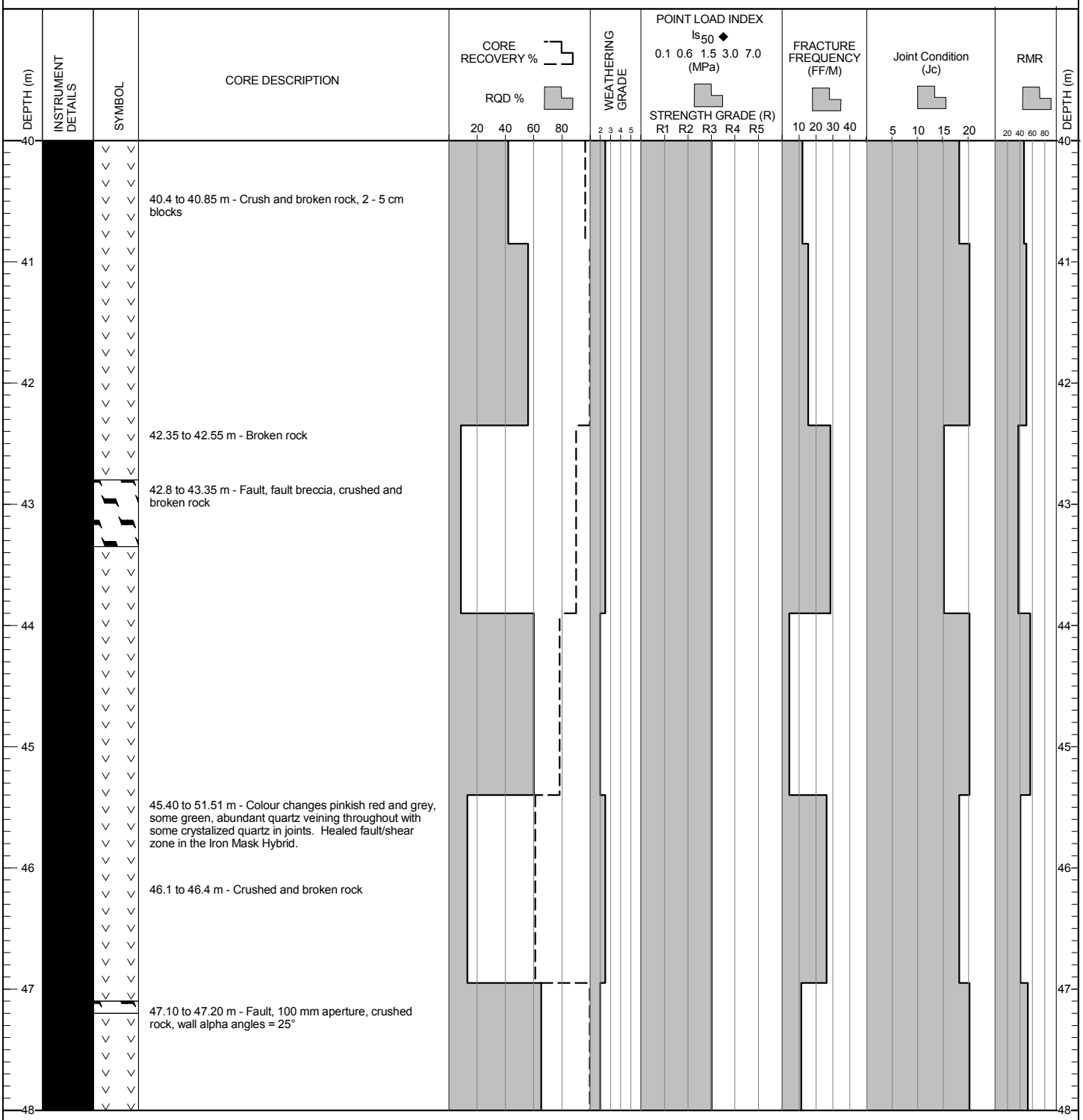
CLIENT: Abacus Mining and Exploration Corporation
PRINT DATE: : 7/26/2011

DRILL HOLE # DH-BGC11-PS-03

CO-ORDINATES : 684,007.E, 5,611,393.N
GROUND ELEVATION (m) : 985
SURVEY METHOD :Handheld GPS
DATUM : NAD83
PLUNGE (°) : 90
TREND (°) : -

DRILL DESIGNATION : B-54
DRILLING CONTRACTOR : Geotech Drilling
DRILL METHOD : ODEX/SPT/Diamond
CORE SIZE : HQ3
FLUID : water
CASED TO (m): 36.6

START DATE : 08 Jan 11
FINISH DATE : 16 Jan 11
FINAL DEPTH (m) : 51.5
DEPTH TO TOP OF ROCK (m) : 35.0
LOGGED BY : AR
REVIEWED BY : HWN



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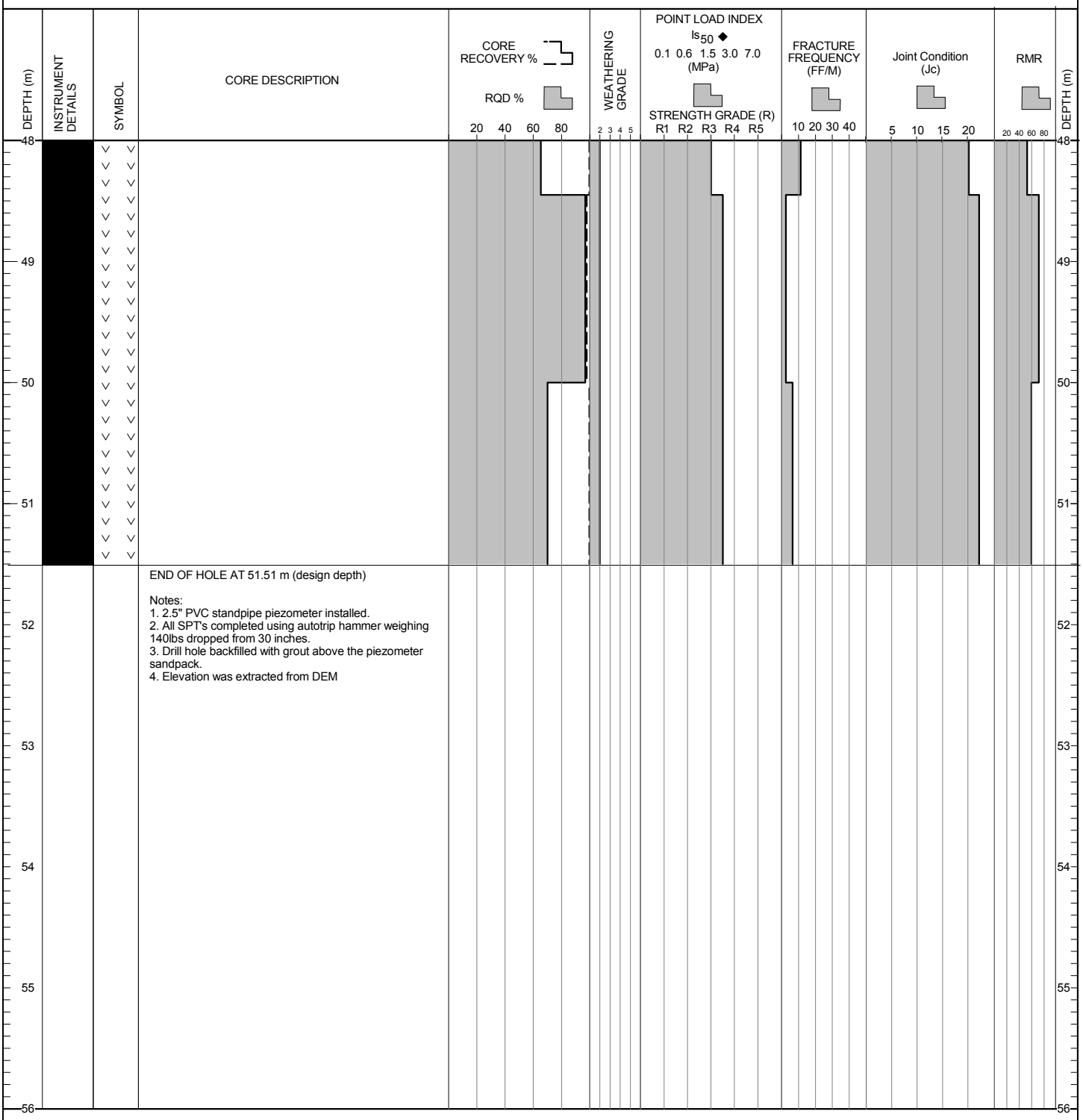
CLIENT: Abacus Mining and Exploration Corporation
PRINT DATE: : 7/26/2011

DRILL HOLE # DH-BGC11-PS-03

CO-ORDINATES : 684,007.E, 5,611,393.N
GROUND ELEVATION (m) : 985
SURVEY METHOD :Handheld GPS
DATUM : NAD83
PLUNGE (°) : 90
TREND (°) : -

DRILL DESIGNATION : B-54
DRILLING CONTRACTOR : Geotech Drilling
DRILL METHOD : ODEX/SPT/Diamond
CORE SIZE : HQ3
FLUID : water
CASED TO (m): 36.6

START DATE : 08 Jan 11
FINISH DATE : 16 Jan 11
FINAL DEPTH (m) : 51.5
DEPTH TO TOP OF ROCK (m) : 35.0
LOGGED BY : AR
REVIEWED BY : HWN



CLIENT: Abacus Mining and Exploration Corporation
PRINT DATE: : 7/26/2011

Survey Method : Handheld GPS
Co-ordinates (m) : 683,170.E, 5,611,331.N
Ground Elevation (m) : 940
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste Track Rig
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/SPT/Diamond
Core : HQ3
Fluid : water
Casing : HW **Cased To (m)** : 21.35

Start Date : 19 Jan 11
Finish Date : 21 Jan 11
Final Depth of Hole (m): : 30.8
Depth to Top of Rock (m) : 20.40
Logged by : AR
Reviewed by : HWN

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details	DCT Blows per 300mm	SPT Blows per 150mm
0		M1		SILT (ML) Trace sand, non plastic, firm, brown, organic odour, moist, no structure, no cementation, trace roots. [TOPSOIL]			3 2 4
1				GRAVEL (GM) and SAND Fine to medium grained, silty, trace clay, well graded, maximum particle size 40 mm, dense, subrounded, brown, no odour, dry to moist, homogeneous, weak cementation. [TILL]			
2		M2					18 23 23
3		M3					12 21 R
4							
5		M4		4.5 m to 5.0 m - very dense 4.55 m - Grain Size Analysis: 27% Gravel, 38% Sand, 40% Fines 4.5 m - moderate cementation, moist.			20 33 33
6		M5					13 19 24
7							
8		M6		GRAVEL (GM) and SAND Fine to medium grained, silty, some clay, well graded, dense, maximum particle size 30 mm, subrounded, brownish grey, no odour, moist,			9 15 20

Su - kPa: 40, 80, 120, 160
VANE PEAK / REMOLD — FIELD ◆ ◇ — LAB ■ □
UC/2 ▲ — Pocket Pen /2 △
★ % Fines
Hydraulic Conductivity (m/sec) 10^{-8} 10^{-6} 10^{-4} 10^{-2}
DCT (blows/300mm)
SPT (blows/300mm) ●
Core Recovery 20 40 60 80
Moisture Content & SPT N
W_P% W% W_L% 20 40 60 80

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Survey Method : Handheld GPS
Co-ordinates (m) : 683,170.E, 5,611,331.N
Ground Elevation (m) : 940
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste Track Rig
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/SPT/Diamond
Core : HQ3
Fluid : water
Casing : HW **Cased To (m)** : 21.35

Start Date : 19 Jan 11
Finish Date : 21 Jan 11
Final Depth of Hole (m): : 30.8
Depth to Top of Rock (m) : 20.40
Logged by : AR
Reviewed by : HWN

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description
8				homogeneous, moderate cementation. [TILL]
9		M7		9.15 m - Grain Size Analysis: 23% Gravel, 34% Sand, 43% Fines
10				
11		M8		GRAVEL (GW) and SAND Fine to medium grained, some silt, well graded, dense to very dense, maximum particle size 40 mm, subrounded, brownish grey, no odour, moist, homogeneous, moderate cementation. [TILL]
12		M9		12.5 m - Water noted during ODEX advance.
13				
14		M10		
15				
16		M11		

Instrument Details

DCT Blows per 300mm

SPT Blows per 150mm: 8, 14, 24 | 24, 15, R | 20, R | 16, R | 18, R

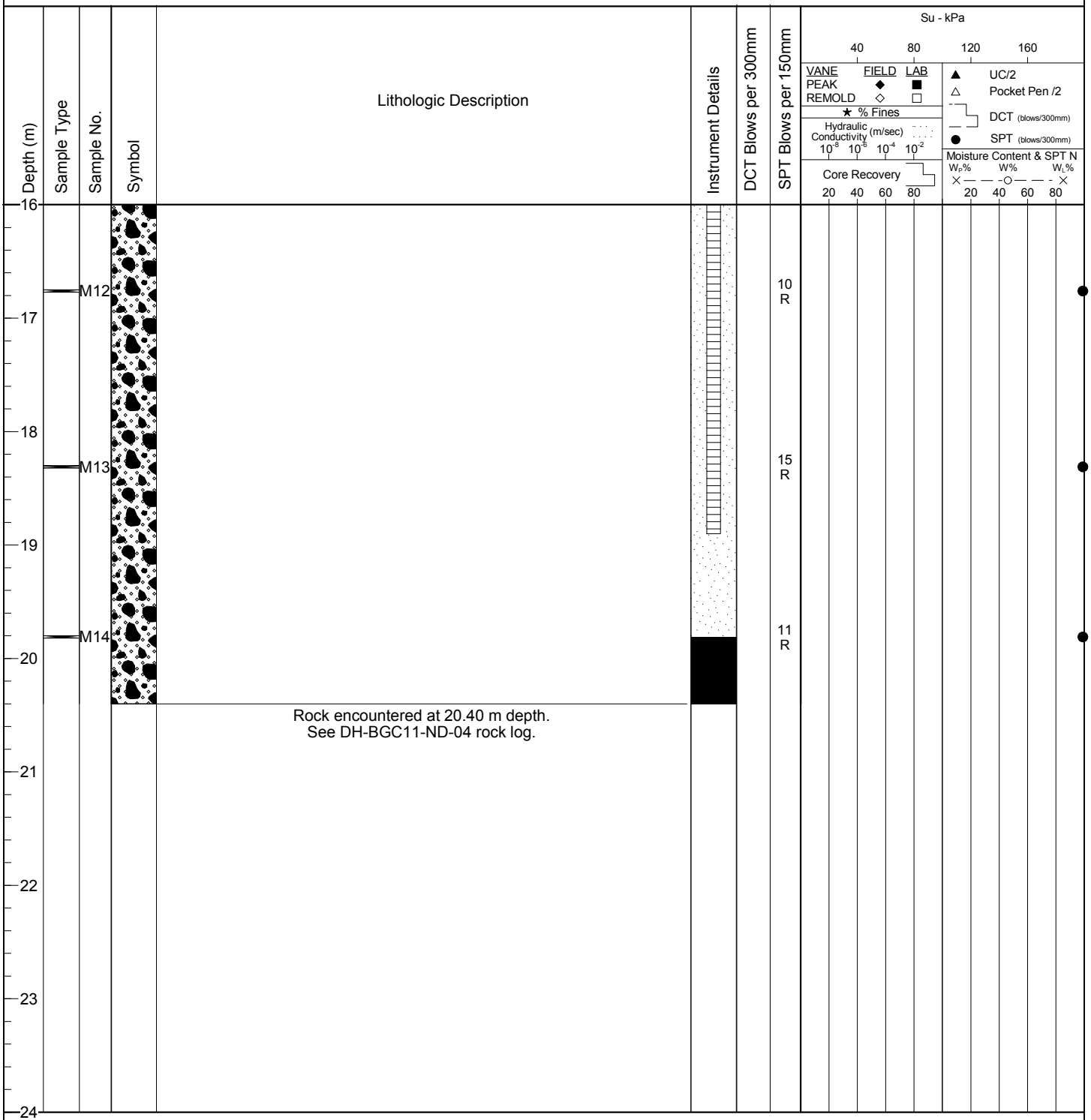
Su - kPa (40, 80, 120, 160)
VANE PEAK / REMOLD — FIELD ◆ ◇ — LAB ■ □
★ % Fines
Hydraulic Conductivity (m/sec) 10^{-8} 10^{-6} 10^{-4} 10^{-2}
Core Recovery (20, 40, 60, 80)
▲ UC/2
△ Pocket Pen /2
DCT (blows/300mm)
● SPT (blows/300mm)
Moisture Content & SPT N
W_P% W% W_L% (20, 40, 60, 80)

(Continued on next page)

Survey Method : Handheld GPS
Co-ordinates (m) : 683,170.E, 5,611,331.N
Ground Elevation (m) : 940
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste Track Rig
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/SPT/Diamond
Core : HQ3
Fluid : water
Casing : HW **Cased To (m)** : 21.35

Start Date : 19 Jan 11
Finish Date : 21 Jan 11
Final Depth of Hole (m): : 30.8
Depth to Top of Rock (m) : 20.40
Logged by : AR
Reviewed by : HWN



PROJECT: Ajax Project Feasibility Study
PROJECT NO. : 0712-003

DRILL HOLE # DH-BGC11-ND-04

CO-ORDINATES : 683,170.E, 5,611,331.N
GROUND ELEVATION (m) : 940
SURVEY METHOD :Handheld GPS
DATUM : NAD83
PLUNGE (°) : 90
TREND (°) : -

DRILL DESIGNATION : Fraste Track Rig
DRILLING CONTRACTOR : Geotech Drilling
DRILL METHOD : ODEX/SPT/Diamond
CORE SIZE : HQ3
FLUID : water
CASED TO (m): 21.35

START DATE : 19 Jan 11
FINISH DATE : 21 Jan 11
FINAL DEPTH (m) : 30.8
DEPTH TO TOP OF ROCK (m) : 20.4
LOGGED BY : AR
REVIEWED BY : HWN

DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION
16			0 to 20.40 m - See DH-BGC11-ND-04 soil log.
20			
21			BEDROCK Intrusive, light greyish green, medium grained, medium strong (R3), slightly to moderately weathered (W2-W3), two joint sets (35-45°, 50-70° from core axis), joint surfaces are moderately strong, close spacing, little infill, planar. [CHERRY CREEK MONZONITE]
24			

CORE RECOVERY % / RQD % (20 40 60 80)
WEATHERING GRADE (2 3 4 5)
POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa)
STRENGTH GRADE (R) R1 R2 R3 R4 R5
FRACTURE FREQUENCY (FF/M) (10 20 30 40)
Joint Condition (Jc) (5 10 15 20)
RMR (20 40 60 80)

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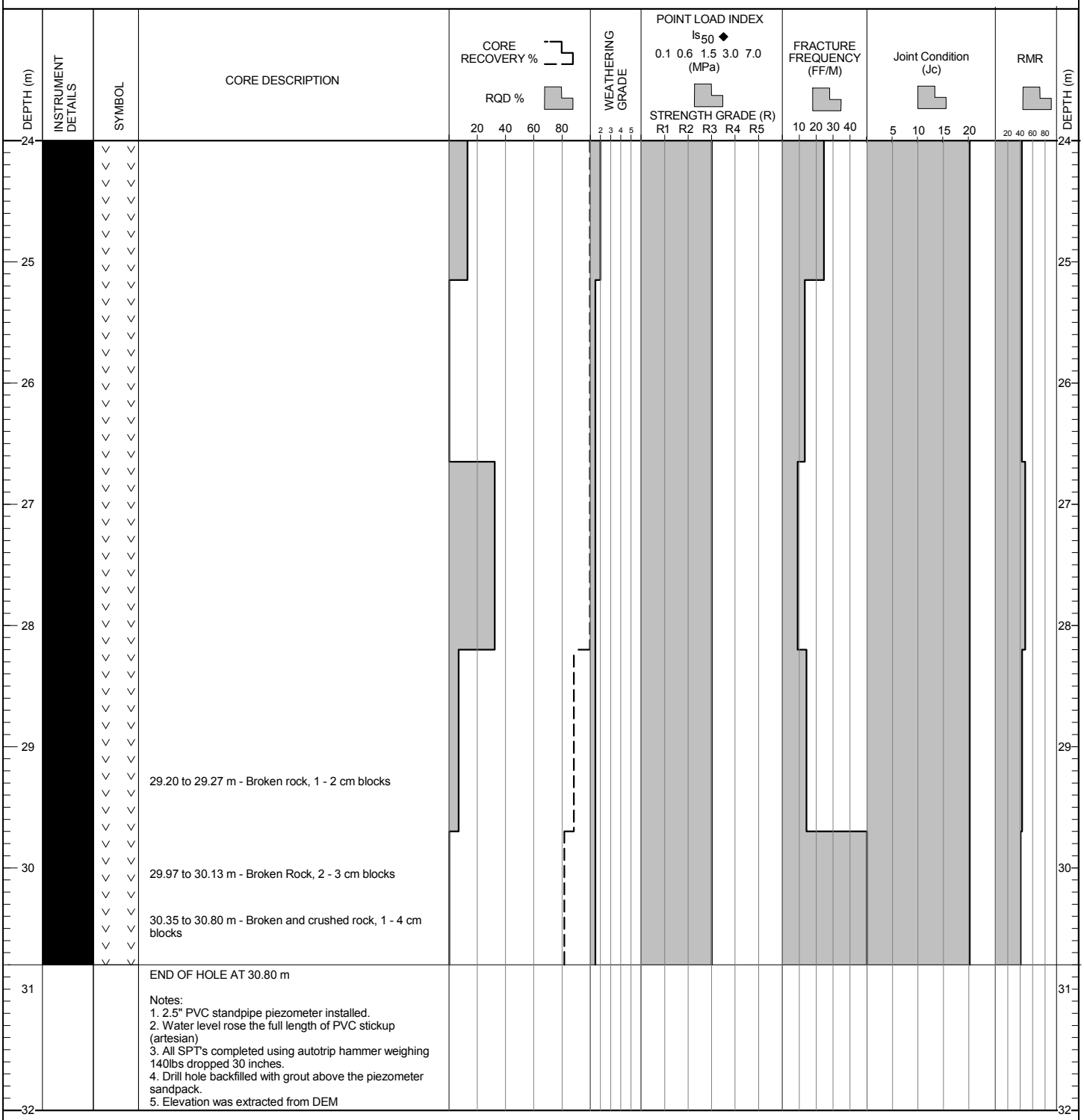
CLIENT: Abacus Mining and Exploration Corporation
PRINT DATE: : 7/26/2011

DRILL HOLE # DH-BGC11-ND-04

CO-ORDINATES : 683,170.E, 5,611,331.N
GROUND ELEVATION (m) : 940
SURVEY METHOD :Handheld GPS
DATUM : NAD83
PLUNGE (°) : 90
TREND (°) : -

DRILL DESIGNATION : Fraste Track Rig
DRILLING CONTRACTOR : Geotech Drilling
DRILL METHOD : ODEX/SPT/Diamond
CORE SIZE : HQ3
FLUID : water
CASED TO (m): 21.35

START DATE : 19 Jan 11
FINISH DATE : 21 Jan 11
FINAL DEPTH (m) : 30.8
DEPTH TO TOP OF ROCK (m) : 20.4
LOGGED BY : AR
REVIEWED BY : HWN



CLIENT: Abacus Mining and Exploration Corporation
PRINT DATE: : 7/26/2011

Survey Method : Handheld GPS
Co-ordinates (m) : 683,224.E, 5,612,090.N
Ground Elevation (m) : 943
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste Track Rig
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/SPT/Diamond
Core : HQ3
Fluid : water
Casing : HW **Cased To (m)** : 10.20

Start Date : 22 Jan 11
Finish Date : 23 Jan 11
Final Depth of Hole (m): : 20.7
Depth to Top of Rock (m) : 8.25
Logged by : AR
Reviewed by : HWN

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description
0				SILT (ML) Trace sand, non plastic, compact, brown, organic odour, moist, no structure, no cementation, trace roots. [TOPSOIL]
1				SILT (ML) and CLAY Some fine to medium sand, some gravel, maximum particle size 25 mm, low plasticity, hard, brown, no odour, moist, no structure, moderate cementation. [TILL]
2		M1		
3		M2		
4				
5		M3		4.55 m - Grain Size Analysis: 13% Gravel, 29% Sand, 28% Silt, 30% Clay.
6				SAND (SM) and GRAVEL Fine to medium grained, silty, clayey, well graded, very dense, maximum particle size 30 mm, subrounded, grey, no odour, moist, moderate cementation. [TILL]
7		M4		
8		M5		7.6 m - Grain Size Analysis: 13% Gravel, 29% Sand, 28% Silt, 30% Clay

Instrument Details

DCT Blows per 300mm

SPT Blows per 150mm: 15, 29, 29 | 12, 17, 21 | 12, 17, 23 | 21, 29, 40 | 17, 65, 56

Su - kPa (40, 80, 120, 160)
VANE PEAK / FIELD ◆ / LAB ■
REMOLD ◇ / □
UC/2 ▲
Pocket Pen /2 △
★ % Fines
Hydraulic Conductivity (m/sec) 10^{-8} 10^{-6} 10^{-4} 10^{-2}
DCT (blows/300mm)
SPT (blows/300mm) ●
Core Recovery (20, 40, 60, 80)
Moisture Content & SPT N
W_P% W% W_L% (20, 40, 60, 80)

(Continued on next page)

Survey Method : Handheld GPS
Co-ordinates (m) : 683,224.E, 5,612,090.N
Ground Elevation (m) : 943
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste Track Rig
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/SPT/Diamond
Core : HQ3
Fluid : water
Casing : HW **Cased To (m)** : 10.20

Start Date : 22 Jan 11
Finish Date : 23 Jan 11
Final Depth of Hole (m): : 20.7
Depth to Top of Rock (m) : 8.25
Logged by : AR
Reviewed by : HWN

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details	DCT Blows per 300mm	SPT Blows per 150mm
8				Rock encountered at 8.25 m depth. See DH-BGC11-ND-05 rock log.			

Su - kPa
40 80 120 160
VANE FIELD LAB
PEAK ◆ ■
REMOLD ◇ □
▲ UC/2
△ Pocket Pen /2
★ % Fines
Hydraulic Conductivity (m/sec)
10^{-8} 10^{-6} 10^{-4} 10^{-2}
DCT (blows/300mm)
● SPT (blows/300mm)
Core Recovery
20 40 60 80
Moisture Content & SPT N
W_P% W% W_L%
20 40 60 80

DRILL HOLE # DH-BGC11-ND-05

CO-ORDINATES : 683,224.E, 5,612,090.N
GROUND ELEVATION (m) : 943
SURVEY METHOD :Handheld GPS
DATUM : NAD83
PLUNGE (°) : 90
TREND (°) : -

DRILL DESIGNATION : Fraste Track Rig
DRILLING CONTRACTOR : Geotech Drilling
DRILL METHOD : ODEX/SPT/Diamond
CORE SIZE : HQ3
FLUID : water
CASED TO (m): 10.20

START DATE : 22 Jan 11
FINISH DATE : 23 Jan 11
FINAL DEPTH (m) : 20.7
DEPTH TO TOP OF ROCK (m) : 8.3
LOGGED BY : AR
REVIEWED BY : HWN

DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % / RQD % (20 40 60 80) | WEATHERING GRADE (2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / STRENGTH GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (10 20 30 40) | Joint Condition (Jc) (5 10 15 20) | RMR (20 40 60 80) | DEPTH (m)

0 to 8.25 m - See DH-BGC11-ND-05 soil log.

BEDROCK
Volcanic, light greyish green, medium grained, massive, medium strong (R3), slightly to moderately weathered (W2-W3), moderately altered, two joint sets (35-45°, 55-70° from core axis), joint surfaces are medium strong, close spacing, trace crushed rock infill, planar, trace quartz veins along joints.
[MAFIC VOLCANICS?]

11.66 to 11.73 m - Fault, 70 mm aperture, fault gouge, alpha angles = 70° and 60°

13.68 to 14.00 m - Broken rock, 3 - 6 cm blocks, 2 discernible alpha angles

(CONTINUED ON NEXT PAGE)

CLIENT: Abacus Mining and Exploration Corporation
PRINT DATE: : 7/26/2011

PROJECT: Ajax Project Feasibility Study

PROJECT NO. : 0712-003

DRILL HOLE # DH-BGC11-ND-05

CO-ORDINATES : 683,224.E, 5,612,090.N
GROUND ELEVATION (m) : 943
SURVEY METHOD :Handheld GPS
DATUM : NAD83
PLUNGE (°) : 90
TREND (°) : -

DRILL DESIGNATION : Fraste Track Rig
DRILLING CONTRACTOR : Geotech Drilling
DRILL METHOD : ODEX/SPT/Diamond
CORE SIZE : HQ3
FLUID : water
CASED TO (m): 10.20

START DATE : 22 Jan 11
FINISH DATE : 23 Jan 11
FINAL DEPTH (m) : 20.7
DEPTH TO TOP OF ROCK (m) : 8.3
LOGGED BY : AR
REVIEWED BY : HWN

DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION
16			16.0 - 19.0 m - primary colour changes to a brownish red.
17			
18			
19			18.57 to 18.85 m - Broken rock, 1 - 3 cm blocks
20			
21			END OF HOLE AT 20.7 m 1. 2.5" PVC standpipe piezometer was installed 2. All SPT's completed using an auto trip hammer weighing 140 lbs dropped 30 inches 3. Drill hole backfilled with grout above the piezometer sandpack. 4. Elevation was extracted from DEM
22			
23			
24			

CORE RECOVERY %
RQD % — 20 40 60 80

WEATHERING GRADE — 2 3 4 5

POINT LOAD INDEX Is_{50} ◆
0.1 0.6 1.5 3.0 7.0 (MPa)
STRENGTH GRADE (R)
R1 R2 R3 R4 R5

FRACTURE FREQUENCY (FF/M) — 10 20 30 40

Joint Condition (Jc) — 5 10 15 20

RMR — 20 40 60 80

CLIENT: Abacus Mining and Exploration Corporation

PRINT DATE: : 7/26/2011

Survey Method : Handheld GPS
Co-ordinates (m) : 682,152.E, 5,610,624.N
Ground Elevation (m) : 947
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste Track Rig
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/SPT/Diamond
Core : HQ3
Fluid : water
Casing : HW **Cased To (m)** : 28.65

Start Date : 24 Jan 11
Finish Date : 27 Jan 11
Final Depth of Hole (m): : 38.7
Depth to Top of Rock (m) : 26.50
Logged by : AR
Reviewed by : HWN

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details	DCT Blows per 300mm	SPT Blows per 150mm
0				SILT (ML) Some sand, some gravel, non plastic, firm, brown, organic odour, dry to moist, no cementation. [TOPSOIL]			
1				GRAVEL (GM) Fine to medium, silty, sandy, well graded, very dense, maximum particle size 40 mm, subrounded, brown, no odour, moist, homogeneous, weak to moderate cementation. [TILL]			
2		M1					16 33 30
3		M2		3.05 m - Grain Size Analysis: 34% Gravel, 32% Sand, 34% Fines			26 46 75
4				GRAVEL and SAND (GW/SW) Some silt, well graded, very dense, maximum particle size 40 mm, subrounded, brown, no odour, moist, homogeneous, moderate cementation, trace oxidation stains. [TILL]			
5		M3					47 66 15
6		M4					44 R
7				GRAVEL (GM) Fine to medium, silty, sandy, moderately graded, very dense, maximum particle size 40 mm, subrounded, brown, no odour, moist, homogeneous, moderate cementation. [TILL]			
8		M5					22 R

Su - kPa: 40, 80, 120, 160
VANE PEAK / FIELD ◆ / LAB ■ / REMOLD ◇ / □
▲ UC/2
△ Pocket Pen /2
★ % Fines
Hydraulic Conductivity (m/sec) 10^{-8} 10^{-6} 10^{-4} 10^{-2}
DCT (blows/300mm)
● SPT (blows/300mm)
Core Recovery 20 40 60 80
Moisture Content & SPT N
W_P% W% W_L% 20 40 60 80

(Continued on next page)

Survey Method : Handheld GPS
Co-ordinates (m) : 682,152.E, 5,610,624.N
Ground Elevation (m) : 947
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste Track Rig
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/SPT/Diamond
Core : HQ3
Fluid : water
Casing : HW **Cased To (m)** : 28.65

Start Date : 24 Jan 11
Finish Date : 27 Jan 11
Final Depth of Hole (m): : 38.7
Depth to Top of Rock (m) : 26.50
Logged by : AR
Reviewed by : HWN

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details	DCT Blows per 300mm	SPT Blows per 150mm
8							
9		M6					26 49 70
10							
11		M7					27 33 45
12		M8		GRAVEL and SAND (GP/SP) Silty, trace clay, well graded, very dense, maximum particle size 40 mm, subrounded, no odour, moist, homogeneous, moderate cementation. [TILL]			24 55 45
13							
14		M9					24 47 23
15							
16		M10					21 25 43

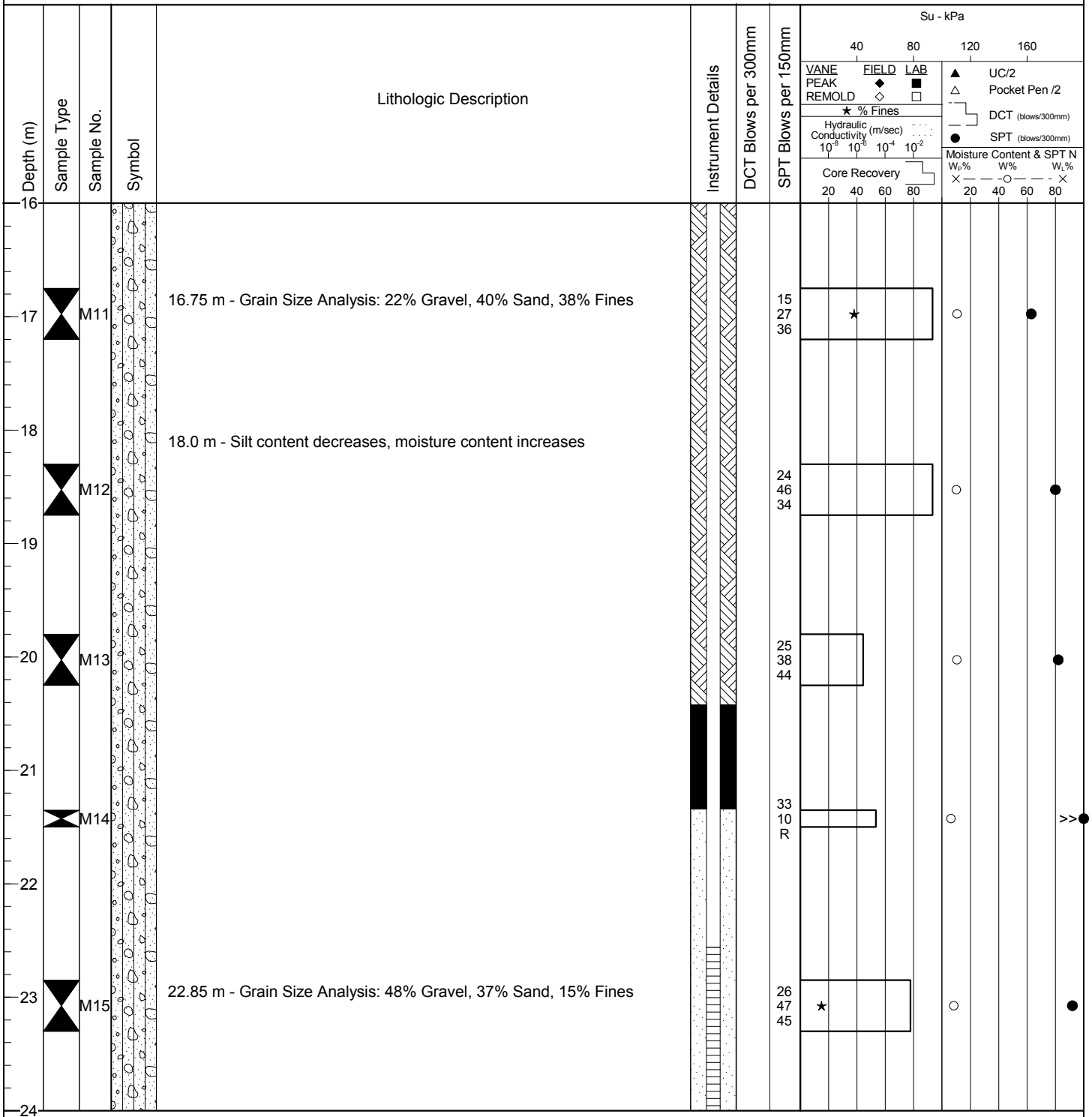
Su - kPa
40 80 120 160
VANE FIELD LAB
PEAK ◆ ■
REMOLD ◇ □
UC/2 ▲
Pocket Pen /2 △
★ % Fines
Hydraulic Conductivity (m/sec) 10^{-8} 10^{-6} 10^{-4} 10^{-2}
DCT (blows/300mm)
SPT (blows/300mm) ●
Core Recovery 20 40 60 80
Moisture Content & SPT N
W_P% W% W_L%
20 40 60 80

(Continued on next page)

Survey Method : Handheld GPS
Co-ordinates (m) : 682,152.E, 5,610,624.N
Ground Elevation (m) : 947
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste Track Rig
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/SPT/Diamond
Core : HQ3
Fluid : water
Casing : HW **Cased To (m)** : 28.65

Start Date : 24 Jan 11
Finish Date : 27 Jan 11
Final Depth of Hole (m): : 38.7
Depth to Top of Rock (m) : 26.50
Logged by : AR
Reviewed by : HWN



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Survey Method : Handheld GPS
Co-ordinates (m) : 682,152.E, 5,610,624.N
Ground Elevation (m) : 947
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste Track Rig
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/SPT/Diamond
Core : HQ3
Fluid : water
Casing : HW **Cased To (m)** : 28.65

Start Date : 24 Jan 11
Finish Date : 27 Jan 11
Final Depth of Hole (m): : 38.7
Depth to Top of Rock (m) : 26.50
Logged by : AR
Reviewed by : HWN

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details	DCT Blows per 300mm	SPT Blows per 150mm
24							
25		M16					17 23 33
				CLAY and SILT (CL/ML) Sandy, some gravel, low plasticity, very stiff, greyish brown, no odour, moist, no structure, moderate cementation, slow to no dilatency. [CLAY SEAM] 25.90 m - Grain Size Analysis: 9% Gravel, 34% Sand, 32% Silt, 25% Clay			
26		M17					14 17 19
				Rock encountered at 26.50 m depth. See DH-BGC11-ND-06 rock log.			
27							
28							
29							
30							
31							
32							

Su - kPa: 40, 80, 120, 160
VANE PEAK / REMOLD — FIELD ◆ ◇ — LAB ■ □
▲ UC/2
△ Pocket Pen /2
★ % Fines
Hydraulic Conductivity (m/sec) 10^{-8} 10^{-6} 10^{-4} 10^{-2}
DCT (blows/300mm)
● SPT (blows/300mm)
Core Recovery 20 40 60 80
Moisture Content & SPT N
W_P% W% W_L% 20 40 60 80

DRILL HOLE # DH-BGC11-ND-06

CO-ORDINATES : 682,152.E, 5,610,624.N
GROUND ELEVATION (m) : 947
SURVEY METHOD :Handheld GPS
DATUM : NAD83
PLUNGE (°) : 90
TREND (°) : -

DRILL DESIGNATION : Fraste Track Rig
DRILLING CONTRACTOR : Geotech Drilling
DRILL METHOD : ODEX/SPT/Diamond
CORE SIZE : HQ3
FLUID : water
CASED TO (m): 28.65

START DATE : 24 Jan 11
FINISH DATE : 27 Jan 11
FINAL DEPTH (m) : 38.7
DEPTH TO TOP OF ROCK (m) : 26.5
LOGGED BY : AR
REVIEWED BY : HWN

DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % / RQD % (20 40 60 80)	WEATHERING GRADE (2 3 4 5)	POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / STRENGTH GRADE (R) R1 R2 R3 R4 R5	FRACTURE FREQUENCY (FF/M) (10 20 30 40)	Joint Condition (Jc) (5 10 15 20)	RMR (20 40 60 80)	DEPTH (m)
24										24
25			0 to 26.50 m - See DH-BGC11-ND-06 soil log.							25
26										26
27		V V	BEDROCK Intrusive, black and dark grey, medium to coarse grained, massive, equigranular, medium strong (R3), fresh to slightly weathered (W1-W2), three joint sets (25-30°, 35-45°, 55-65° from core axis), joint surfaces are medium strong, close spacing, little infill, planar, some joints along quartz veins. [IRON MASK HYBRID]						27
28										28
29										29
30										30
31										31
32										32

(CONTINUED ON NEXT PAGE)

CLIENT: Abacus Mining and Exploration Corporation
PRINT DATE: : 7/26/2011

PROJECT: Ajax Project Feasibility Study

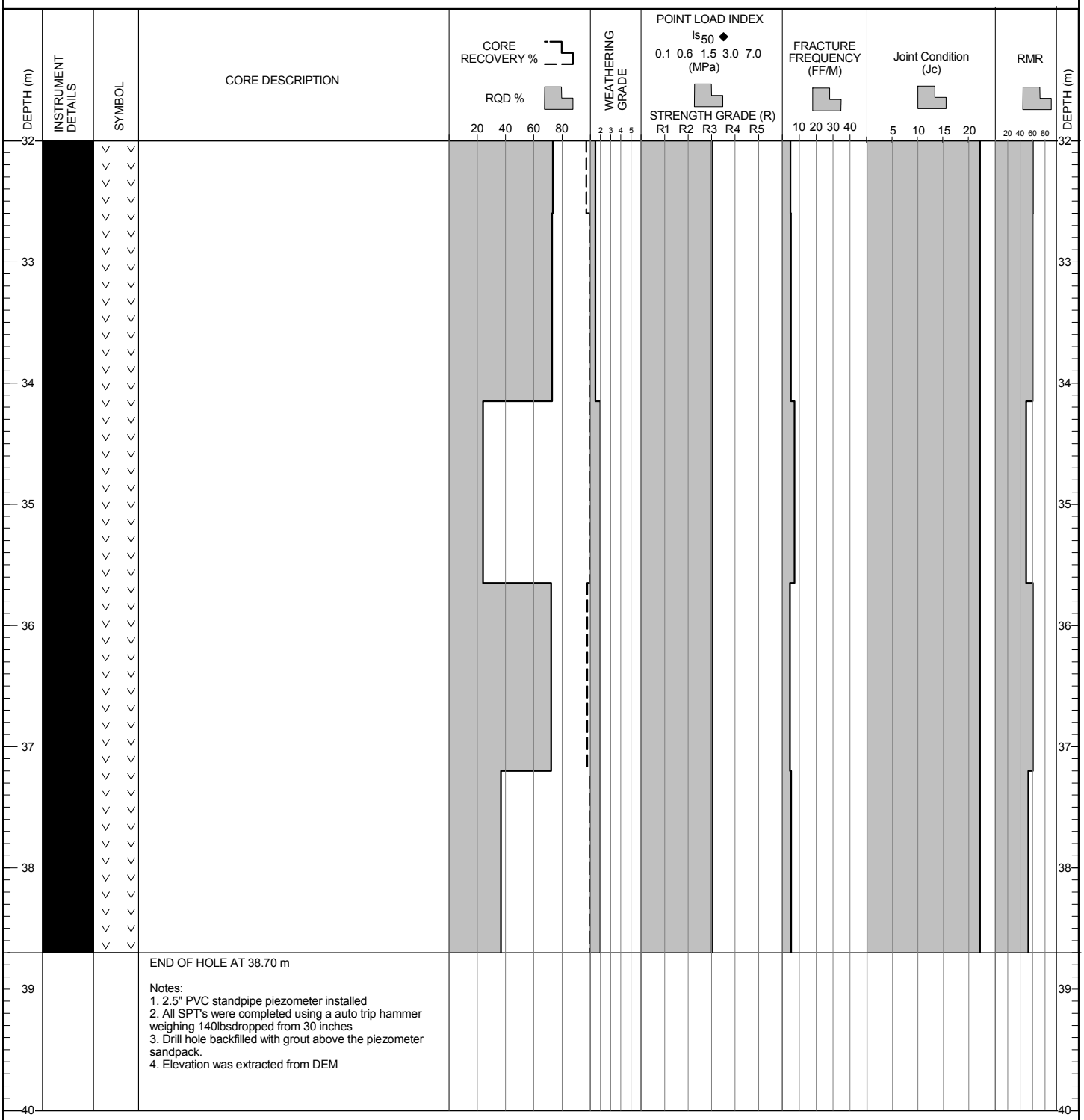
PROJECT NO. : 0712-003

DRILL HOLE # DH-BGC11-ND-06

CO-ORDINATES : 682,152.E, 5,610,624.N
GROUND ELEVATION (m) : 947
SURVEY METHOD :Handheld GPS
DATUM : NAD83
PLUNGE (°) : 90
TREND (°) : -

DRILL DESIGNATION : Fraste Track Rig
DRILLING CONTRACTOR : Geotech Drilling
DRILL METHOD : ODEX/SPT/Diamond
CORE SIZE : HQ3
FLUID : water
CASED TO (m): 28.65

START DATE : 24 Jan 11
FINISH DATE : 27 Jan 11
FINAL DEPTH (m) : 38.7
DEPTH TO TOP OF ROCK (m) : 26.5
LOGGED BY : AR
REVIEWED BY : HWN



CLIENT: Abacus Mining and Exploration Corporation

PRINT DATE: : 7/26/2011

Survey Method : Handheld GPS
Co-ordinates (m) : 681,095.E, 5,610,715.N
Ground Elevation (m) : 896
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste Track Rig
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/SPT/Diamond
Core : HQ3
Fluid : water
Casing : HW **Cased To (m)** : 5.80

Start Date : 31 Jan 11
Finish Date : 02 Feb 11
Final Depth of Hole (m): : 16.0
Depth to Top of Rock (m) : 3.95
Logged by : AR
Reviewed by : HWN

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details	DCT Blows per 300mm	SPT Blows per 150mm
0		M1		SILT (ML) Trace fine sand, trace gravel, non plastic, stiff, brown, organic odour, dry to moist, no structure, no cementation, some roots. [TILL?]			15 6 6
1				SILT (ML) Sandy (fine), some clay, some gravel, low plasticity, stiff, brown, no odour, dry to moist, no structure, weak to moderate cementation, trace oxidation staining. [TILL?] 1.50 m - Grain Size Analysis: 8% Gravel, 39% Sand, 42% Silt, 11% Clay			
2		M2					9 14 23
3		M3					10 8 7
4				Rock encountered at 3.95 m depth. See DH-BGC11-ND-07 rock log.			
5							
6							
7							
8							

Su - kPa
40 80 120 160
VANE FIELD LAB
PEAK ◆ ■
REMOLD ◇ □
▲ UC/2
△ Pocket Pen /2
★ % Fines
Hydraulic Conductivity (m/sec)
10^{-8} 10^{-6} 10^{-4} 10^{-2}
DCT (blows/300mm)
● SPT (blows/300mm)
Core Recovery
20 40 60 80
Moisture Content & SPT N
W_P% W% W_L%
20 40 60 80

DRILL HOLE # DH-BGC11-ND-07

CO-ORDINATES : 681,095.E, 5,610,715.N
GROUND ELEVATION (m) : 896
SURVEY METHOD :Handheld GPS
DATUM : NAD83
PLUNGE (°) : 90
TREND (°) : -

DRILL DESIGNATION : Fraste Track Rig
DRILLING CONTRACTOR : Geotech Drilling
DRILL METHOD : ODEX/SPT/Diamond
CORE SIZE : HQ3
FLUID : water
CASED TO (m): 5.80

START DATE : 31 Jan 11
FINISH DATE : 02 Feb 11
FINAL DEPTH (m) : 16.0
DEPTH TO TOP OF ROCK (m) : 4.0
LOGGED BY : AR
REVIEWED BY : HWN

DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % / RQD % (20 40 60 80) | WEATHERING GRADE (2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / STRENGTH GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (10 20 30 40) | Joint Condition (Jc) (5 10 15 20) | RMR (20 40 60 80) | DEPTH (m)

0 to 3.95 m - See DH-BGC11-ND-07 soil log.

BEDROCK
drilled with ODEX system

BEDROCK
Intrusive, dark green and grey, medium grained, massive, equigranular, medium strong (R3), slightly to moderately weathered (W2-W3), three joint sets (30-35°, 40-55°, 65-70° from core axis), joint surfaces are medium strong, close spacing, trace iron oxide staining, planar.
[SUGARLOAF/VOLCANIC HYBRID]

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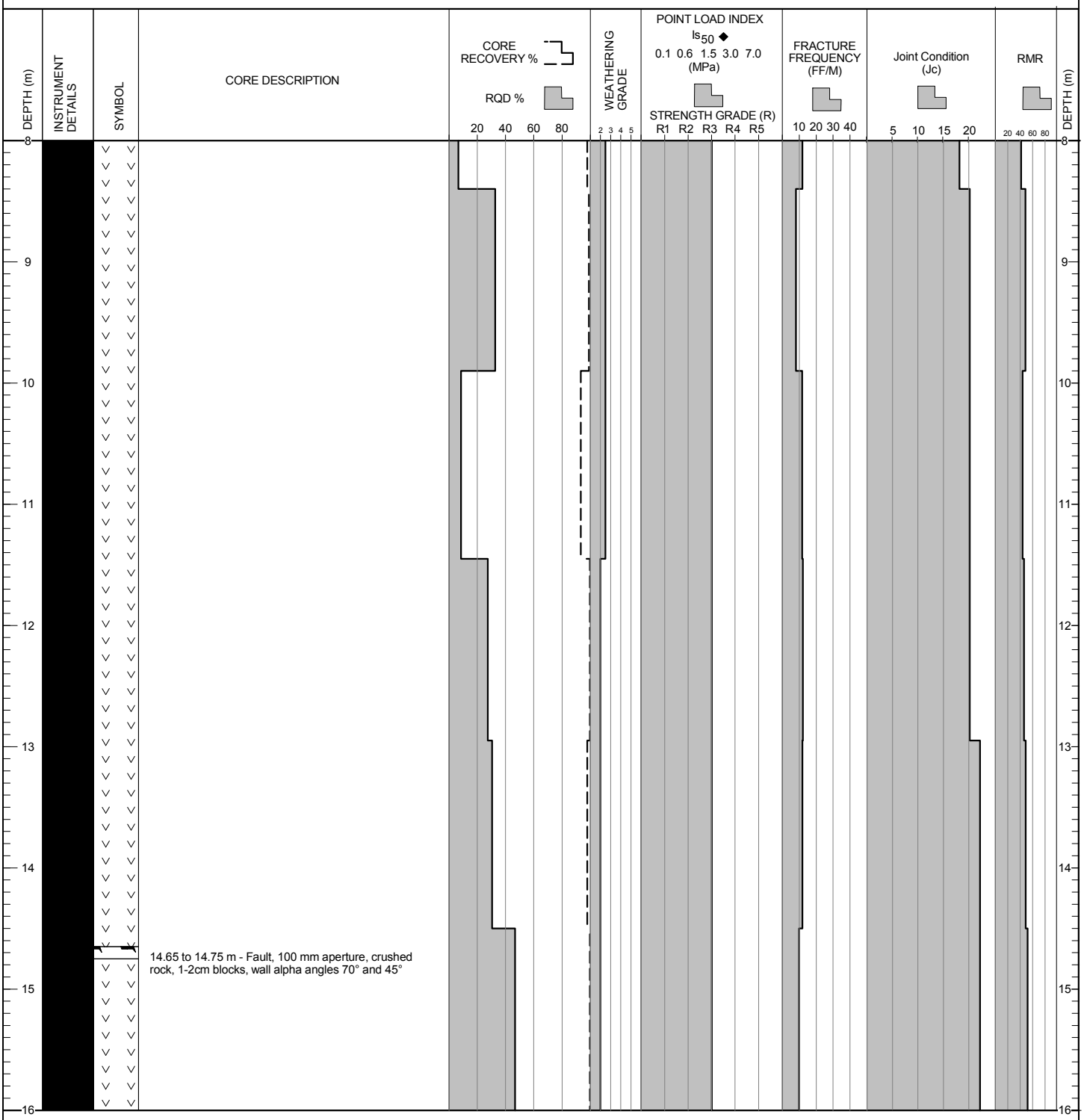
CLIENT: Abacus Mining and Exploration Corporation
PRINT DATE: : 7/26/2011

DRILL HOLE # DH-BGC11-ND-07

CO-ORDINATES : 681,095.E, 5,610,715.N
GROUND ELEVATION (m) : 896
SURVEY METHOD :Handheld GPS
DATUM : NAD83
PLUNGE (°) : 90
TREND (°) : -

DRILL DESIGNATION : Fraste Track Rig
DRILLING CONTRACTOR : Geotech Drilling
DRILL METHOD : ODEX/SPT/Diamond
CORE SIZE : HQ3
FLUID : water
CASED TO (m): 5.80

START DATE : 31 Jan 11
FINISH DATE : 02 Feb 11
FINAL DEPTH (m) : 16.0
DEPTH TO TOP OF ROCK (m) : 4.0
LOGGED BY : AR
REVIEWED BY : HWN



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CLIENT: Abacus Mining and Exploration Corporation
PRINT DATE: : 7/26/2011

PROJECT: Ajax Project Feasibility Study

PROJECT NO. : 0712-003

DRILL HOLE # DH-BGC11-ND-07

CO-ORDINATES : 681,095.E, 5,610,715.N
GROUND ELEVATION (m) : 896
SURVEY METHOD :Handheld GPS
DATUM : NAD83
PLUNGE (°) : 90
TREND (°) : -

DRILL DESIGNATION : Fraste Track Rig
DRILLING CONTRACTOR : Geotech Drilling
DRILL METHOD : ODEX/SPT/Diamond
CORE SIZE : HQ3
FLUID : water
CASED TO (m): 5.80

START DATE : 31 Jan 11
FINISH DATE : 02 Feb 11
FINAL DEPTH (m) : 16.0
DEPTH TO TOP OF ROCK (m) : 4.0
LOGGED BY : AR
REVIEWED BY : HWN

DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % / RQD % (20 40 60 80)	WEATHERING GRADE (2 3 4 5)	POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / STRENGTH GRADE (R) R1 R2 R3 R4 R5	FRACTURE FREQUENCY (FF/M) (10 20 30 40)	Joint Condition (Jc) (5 10 15 20)	RMR (20 40 60 80)	DEPTH (m)
16			END OF HOLE AT 16.00m Notes: 1. 2.5" PVC standpipe piezometer installed 2. All SPT's completed using an auto trip hammer weighing 140 lbs, dropped from 30 inches. 3. Drill hole backfilled with bentonite chips above the piezometer sandpack. 4. Elevation was extracted from DEM							16
17										17
18										18
19										19
20										20
21										21
22										22
23										23
24										24

CLIENT: Abacus Mining and Exploration Corporation

PRINT DATE: : 7/26/2011

Survey Method : Handheld GPS
Co-ordinates (m) : 681,087.E, 5,611,360.N
Ground Elevation (m) : 897
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste Track Rig
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/SPT/Diamond
Core : HQ3
Fluid : water
Casing : HW **Cased To (m)** : 21.10

Start Date : 03 Feb 11
Finish Date : 05 Feb 11
Final Depth of Hole (m): : 29.8
Depth to Top of Rock (m) : 20.40
Logged by : MM
Reviewed by : HWN

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description
0		M1		Silt and sand, trace rootlets. [TOPSOIL]
1				GRAVEL (GW) Sandy, some silt, compact, well graded, subangular to subrounded, dry, light brown, homogeneous. [TILL]
		M2		
2				
3		M3		SAND (SM) and GRAVEL Fine grained, silty, trace clay, damp, compact to dense, well graded, maximum particle size 30 mm, brown, homogeneous, moderate cementation. [TILL?]
4				
		M4		
5				
6		M5		5.85 m - Grain Size Analysis: 35% Gravel, 37% Sand, 28% Fines
7				
		M6		
8				

Instrument Details

DCT Blows per 300mm

SPT Blows per 150mm: 10, 9, 7 | 10, 24, 33 | 14, 14, 17 | 3, 4, 8 | 22, 19, 23 | 16, 23, 22

Su - kPa (40, 80, 120, 160)
VANE FIELD LAB
PEAK ◆ ■
REMOLD ◇ □
▲ UC/2
△ Pocket Pen /2
★ % Fines
Hydraulic Conductivity (m/sec) 10^{-8} 10^{-6} 10^{-4} 10^{-2}
DCT (blows/300mm)
● SPT (blows/300mm)
Core Recovery (20, 40, 60, 80)
Moisture Content & SPT N
W_P% W% W_L% (20, 40, 60, 80)

(Continued on next page)

Survey Method : Handheld GPS
Co-ordinates (m) : 681,087.E, 5,611,360.N
Ground Elevation (m) : 897
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste Track Rig
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/SPT/Diamond
Core : HQ3
Fluid : water
Casing : HW **Cased To (m)** : 21.10

Start Date : 03 Feb 11
Finish Date : 05 Feb 11
Final Depth of Hole (m): : 29.8
Depth to Top of Rock (m) : 20.40
Logged by : MM
Reviewed by : HWN

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details	DCT Blows per 300mm	SPT Blows per 150mm
9		M7		GRAVEL (GM) Sandy, silty, trace clay, dense to very dense, well graded, maximum particle size 30 mm, brown, subrounded to subangular, damp, homogeneous. [TILL]			12 23 23
10		M8					12 22 24
11							
12		M9					13 21 23
13							
14		M10		13.50 m - Grain Size Analysis: 27% Gravel, 33% Sand, 40% Fines			12 23 36
15		M11		15.0 m - some sand, very dense, moist.			15 26 41
16							

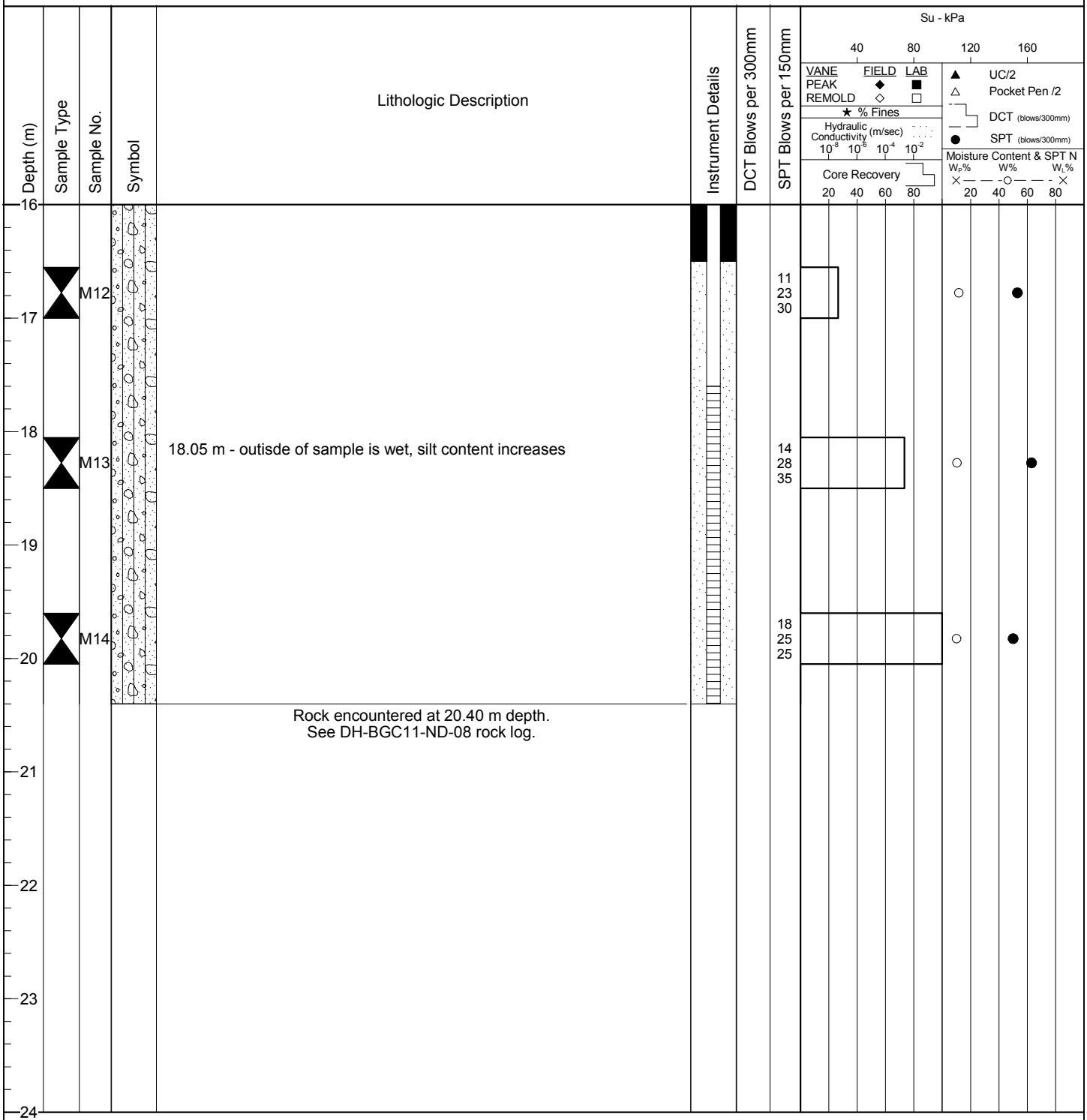
Su - kPa: 40, 80, 120, 160
VANE PEAK / REMOLD — FIELD ◆ ◇ — LAB ■ □
▲ UC/2
△ Pocket Pen /2
★ % Fines
DCT (blows/300mm)
● SPT (blows/300mm)
Hydraulic Conductivity (m/sec) 10^{-8} 10^{-6} 10^{-4} 10^{-2}
Core Recovery: 20, 40, 60, 80
Moisture Content & SPT N: W_P% W% W_L%: 20, 40, 60, 80

(Continued on next page)

Survey Method : Handheld GPS
Co-ordinates (m) : 681,087.E, 5,611,360.N
Ground Elevation (m) : 897
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste Track Rig
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/SPT/Diamond
Core : HQ3
Fluid : water
Casing : HW **Cased To (m)** : 21.10

Start Date : 03 Feb 11
Finish Date : 05 Feb 11
Final Depth of Hole (m): : 29.8
Depth to Top of Rock (m) : 20.40
Logged by : MM
Reviewed by : HWN



DRILL HOLE # DH-BGC11-ND-08

CO-ORDINATES : 681,087.E, 5,611,360.N
GROUND ELEVATION (m) : 897
SURVEY METHOD :Handheld GPS
DATUM : NAD83
PLUNGE (°) : 90
TREND (°) : -

DRILL DESIGNATION : Fraste Track Rig
DRILLING CONTRACTOR : Geotech Drilling
DRILL METHOD : ODEX/SPT/Diamond
CORE SIZE : HQ3
FLUID : water
CASED TO (m): 21.10

START DATE : 03 Feb 11
FINISH DATE : 05 Feb 11
FINAL DEPTH (m) : 29.8
DEPTH TO TOP OF ROCK (m) : 20.4
LOGGED BY : MM
REVIEWED BY : HWN

DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % / RQD % (20 40 60 80)	WEATHERING GRADE (2 3 4 5)	POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / STRENGTH GRADE (R) R1 R2 R3 R4 R5	FRACTURE FREQUENCY (FF/M) (10 20 30 40)	Joint Condition (Jc) (5 10 15 20)	RMR (20 40 60 80)	DEPTH (m)
16										16
17										17
18			0 to 20.40 m - See DH-BGC11-ND-08 soil log.							18
19										19
20										20
21			BEDROCK Intrusive, greenish grey, medium grained, massive, medium strong (R3), slightly weathered (W2), one joint set (50-75° from core axis), joint surfaces are medium strong, close spacing, iron oxide stains on joints and fractures, planar. [SUGAR LOAF DIORITE]							21
22										22
23										23
24										24

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CLIENT: Abacus Mining and Exploration Corporation
PRINT DATE: : 7/26/2011

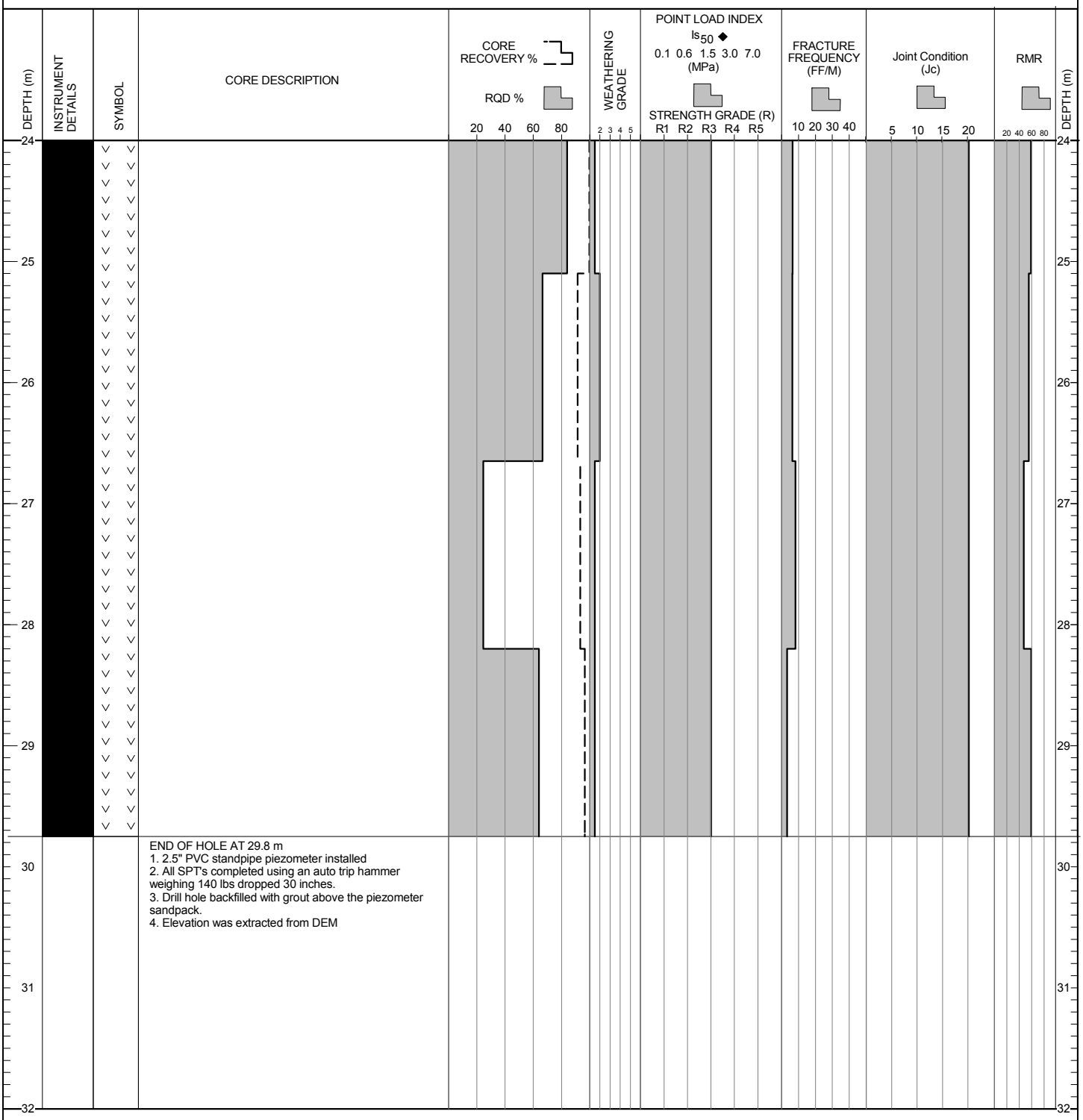
PROJECT: Ajax Project Feasibility Study
PROJECT NO. : 0712-003

DRILL HOLE # DH-BGC11-ND-08

CO-ORDINATES : 681,087.E, 5,611,360.N
GROUND ELEVATION (m) : 897
SURVEY METHOD :Handheld GPS
DATUM : NAD83
PLUNGE (°) : 90
TREND (°) : -

DRILL DESIGNATION : Fraste Track Rig
DRILLING CONTRACTOR : Geotech Drilling
DRILL METHOD : ODEX/SPT/Diamond
CORE SIZE : HQ3
FLUID : water
CASED TO (m): 21.10

START DATE : 03 Feb 11
FINISH DATE : 05 Feb 11
FINAL DEPTH (m) : 29.8
DEPTH TO TOP OF ROCK (m) : 20.4
LOGGED BY : MM
REVIEWED BY : HWN



CLIENT: Abacus Mining and Exploration Corporation
PRINT DATE: : 7/26/2011

Survey Method : Handheld GPS
Co-ordinates (m) : 681,170.E, 5,612,246.N
Ground Elevation (m) : 878
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste Track Rig
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/SPT/Diamond
Core : HQ3
Fluid : water
Casing : HW **Cased To (m)** : 4.35

Start Date : 05 Feb 11
Finish Date : 05 Feb 11
Final Depth of Hole (m): : 13.1
Depth to Top of Rock (m) : 2.90
Logged by : MM
Reviewed by : HWN

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details	DCT Blows per 300mm	SPT Blows per 150mm
0		M1		SAND (SP) and GRAVEL Trace silt, very dense, poorly graded, homogeneous, dry, light brown. [TILL]			33 8 R
1							
		M2					28 41 41
2							
		M3					R
3				Rock encountered at 2.90 m depth. See DH-BGC11-ND-09 rock log.			
4							
5							
6							
7							
8							

Su - kPa
40 80 120 160
VANE FIELD LAB
PEAK ◆ ■
REMOLD ◇ □
▲ UC/2
△ Pocket Pen /2
★ % Fines
Hydraulic Conductivity (m/sec)
10^{-8} 10^{-6} 10^{-4} 10^{-2}
DCT (blows/300mm)
● SPT (blows/300mm)
Core Recovery
20 40 60 80
Moisture Content & SPT N
W_P% W% W_L%
20 40 60 80

PROJECT: Ajax Project Feasibility Study

PROJECT NO. : 0712-003

DRILL HOLE # DH-BGC11-ND-09

CO-ORDINATES : 681,170.E, 5,612,246.N
GROUND ELEVATION (m) : 878
SURVEY METHOD :Handheld GPS
DATUM : NAD83
PLUNGE (°) : 90
TREND (°) : -

DRILL DESIGNATION : Fraste Track Rig
DRILLING CONTRACTOR : Geotech Drilling
DRILL METHOD : ODEX/SPT/Diamond
CORE SIZE : HQ3
FLUID : water
CASED TO (m): 4.35

START DATE : 05 Feb 11
FINISH DATE : 05 Feb 11
FINAL DEPTH (m) : 13.1
DEPTH TO TOP OF ROCK (m) : 2.9
LOGGED BY : MM
REVIEWED BY : HWN

DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION
0			0 to 2.90 m - See DH-BGC11-ND-09 soil log.
3			BEDROCK Intrusive, Greenish grey, trace pink, medium grained, massive, medium strong (R3), slightly weathered (W2), one discernible joint set (30-60° from core axis), joint surfaces are medium strong, close to moderately close spacing, some iron oxide staining on fractures, smooth to rough, planar. [SUGARLOAF DIORITE]
8			

CORE RECOVERY %
RQD % — 20 40 60 80

WEATHERING GRADE — 2 3 4 5

POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa)
STRENGTH GRADE (R) R1 R2 R3 R4 R5

FRACTURE FREQUENCY (FF/M) — 10 20 30 40

Joint Condition (Jc) — 5 10 15 20

RMR — 20 40 60 80

(CONTINUED ON NEXT PAGE)

CLIENT: Abacus Mining and Exploration Corporation

PRINT DATE: : 7/26/2011

PROJECT: Ajax Project Feasibility Study

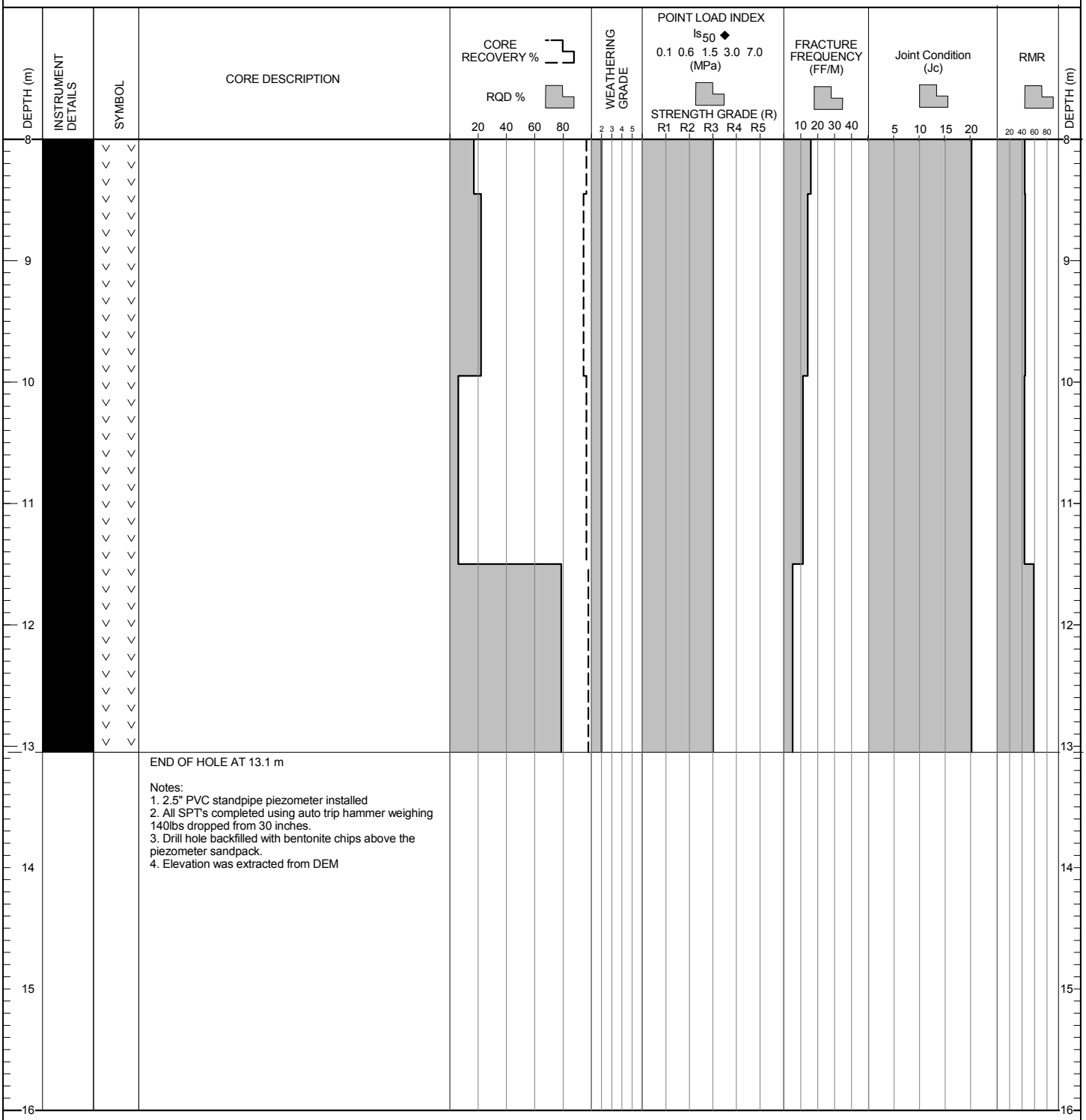
PROJECT NO. : 0712-003

DRILL HOLE # DH-BGC11-ND-09

CO-ORDINATES : 681,170.E, 5,612,246.N
GROUND ELEVATION (m) : 878
SURVEY METHOD :Handheld GPS
DATUM : NAD83
PLUNGE (°) : 90
TREND (°) : -

DRILL DESIGNATION : Fraste Track Rig
DRILLING CONTRACTOR : Geotech Drilling
DRILL METHOD : ODEX/SPT/Diamond
CORE SIZE : HQ3
FLUID : water
CASED TO (m): 4.35

START DATE : 05 Feb 11
FINISH DATE : 05 Feb 11
FINAL DEPTH (m) : 13.1
DEPTH TO TOP OF ROCK (m) : 2.9
LOGGED BY : MM
REVIEWED BY : HWN



CLIENT: Abacus Mining and Exploration Corporation

PRINT DATE: : 7/26/2011

DRILL HOLE # DH-BGC11-ND-10

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m) : 682,145.E, 5,612,334.N
Ground Elevation (m) : 947
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste Track Rig
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/SPT/Diamond
Core : HQ3
Fluid : water
Casing : HW **Cased To (m)** : 1.30

Start Date : 06 Feb 11
Finish Date : 06 Feb 11
Final Depth of Hole (m): : 10.1
Depth to Top of Rock (m) : 0.90
Logged by : MM
Reviewed by : HWN

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details	DCT Blows per 300mm	SPT Blows per 150mm
0		M1		Silt, sand, dark brown, frozen. [TOPSOIL]			26
				SAND (SW) and GRAVEL Fine grained, some silt, light brown, dense to very dense, well graded. [TILL]			31
1				Rock encountered at 0.90 m depth. See DH-BGC11-ND-10 rock log.			21
2							
3							
4							
5							
6							
7							
8							

Su - kPa
40 80 120 160
VANE FIELD LAB
PEAK ◆ ■
REMOLD ◇ □
▲ UC/2
△ Pocket Pen /2
★ % Fines
Hydraulic Conductivity (m/sec)
10^{-8} 10^{-6} 10^{-4} 10^{-2}
DCT (blows/300mm)
● SPT (blows/300mm)
Core Recovery
20 40 60 80
Moisture Content & SPT N
W_P% W% W_L%
20 40 60 80

AJAX (SOIL) AJAX_SOIL.GDL BGC.GDT 7/26/11

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: Abacus Mining and Exploration Corporation

PROJECT: Ajax Project Feasibility Study

PROJECT NO. : 0712-003

DRILL HOLE # DH-BGC11-ND-10

CO-ORDINATES : 682,145.E, 5,612,334.N
GROUND ELEVATION (m) : 947
SURVEY METHOD :Handheld GPS
DATUM : NAD83
PLUNGE (°) : 90
TREND (°) : -

DRILL DESIGNATION : Fraste Track Rig
DRILLING CONTRACTOR : Geotech Drilling
DRILL METHOD : ODEX/SPT/Diamond
CORE SIZE : HQ3
FLUID : water
CASED TO (m): 1.30

START DATE : 06 Feb 11
FINISH DATE : 06 Feb 11
FINAL DEPTH (m) : 10.1
DEPTH TO TOP OF ROCK (m) : 0.9
LOGGED BY : MM
REVIEWED BY : HWN

DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION
0			0 to 0.90 m - See DH-BGC11-ND-10 soil log.
1			BEDROCK Intrusive, greenish grey, medium grained, massive, weak to medium strong (R2-R3), slightly to moderately weathered (W2-W3), two joint sets (25-45°, 55-70° from core axis), joint surfaces are medium strong, close to moderately close spacing, little to no infill, trace iron staining on joints and fractures, smooth to rough. [POTHOOK DIORITE]
7			7.0 m - Rock becomes less fractured.
8			

CORE RECOVERY %
RQD % 20 40 60 80

WEATHERING GRADE 2 3 4 5

POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa)
STRENGTH GRADE (R) R1 R2 R3 R4 R5

FRACTURE FREQUENCY (FF/M) 10 20 30 40

Joint Condition (Jc) 5 10 15 20

RMR 20 40 60 80

(CONTINUED ON NEXT PAGE)

CLIENT: Abacus Mining and Exploration Corporation

PRINT DATE: : 7/26/2011

PROJECT: Ajax Project Feasibility Study

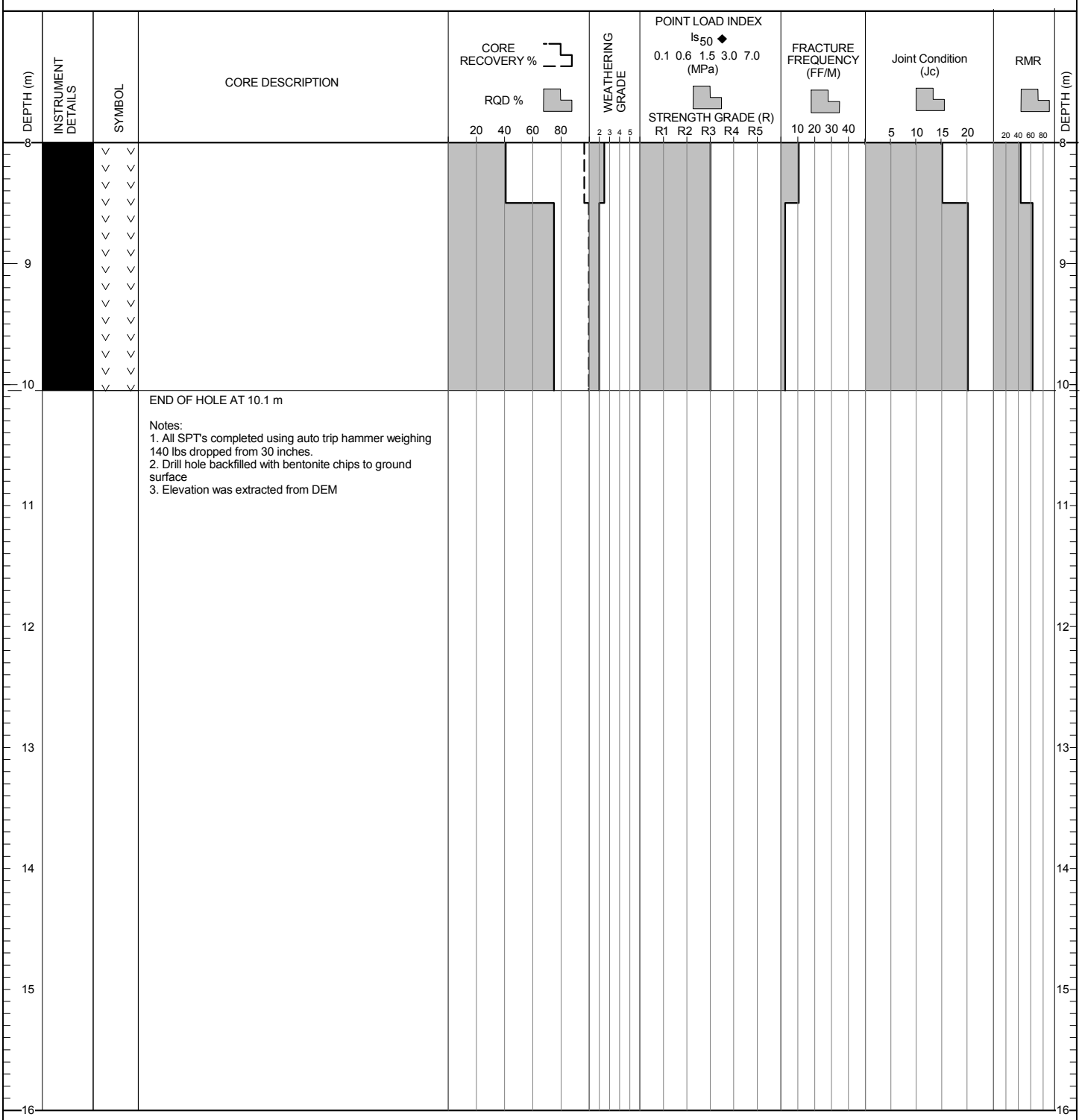
PROJECT NO. : 0712-003

DRILL HOLE # DH-BGC11-ND-10

CO-ORDINATES : 682,145.E, 5,612,334.N
GROUND ELEVATION (m) : 947
SURVEY METHOD :Handheld GPS
DATUM : NAD83
PLUNGE (°) : 90
TREND (°) : -

DRILL DESIGNATION : Fraste Track Rig
DRILLING CONTRACTOR : Geotech Drilling
DRILL METHOD : ODEX/SPT/Diamond
CORE SIZE : HQ3
FLUID : water
CASED TO (m): 1.30

START DATE : 06 Feb 11
FINISH DATE : 06 Feb 11
FINAL DEPTH (m) : 10.1
DEPTH TO TOP OF ROCK (m) : 0.9
LOGGED BY : MM
REVIEWED BY : HWN



END OF HOLE AT 10.1 m

Notes:
1. All SPT's completed using auto trip hammer weighing 140 lbs dropped from 30 inches.
2. Drill hole backfilled with bentonite chips to ground surface
3. Elevation was extracted from DEM

CLIENT: Abacus Mining and Exploration Corporation

PRINT DATE: : 7/26/2011

Survey Method : Handheld GPS
Co-ordinates (m) : 685,639.E, 5,609,914.N
Ground Elevation (m) : 936
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste Track Rig
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/SPT/Diamond
Core : HQ3
Fluid : water
Casing : HW **Cased To (m)** : 30.25

Start Date : 07 Feb 11
Finish Date : 09 Feb 11
Final Depth of Hole (m): : 40.6
Depth to Top of Rock (m) : 29.25
Logged by : MM
Reviewed by : HWN

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details	DCT Blows per 300mm	SPT Blows per 150mm
0				Silt, brown, frozen, grass, rootlets [TOPSOIL]			
1				SAND (SM) Fine grained, silty, some gravel, trace cobbles, compact, poorly graded, max particle size 20mm, angular to sub rounded, brown, dry, homogeneous, weak cementation. [TILL]			
		M1					12 16 40
2							
		M2		2.85 m - Boulder			R
3							
4							
		M3		GRAVEL (GM) Sandy, silty, compact to dense, well graded, sub angular to subrounded, homogeneous, brown, damp. [TILL]			13 13 20
5							
6		M4					8 12 14
7							
		M5		7.40 m - sand content decreases			7 12 14
8							

Su - kPa: 40, 80, 120, 160
VANE PEAK / REMOLD — FIELD ◆ ◇ — LAB ■ □
▲ UC/2
△ Pocket Pen /2
DCT (blows/300mm)
● SPT (blows/300mm)
★ % Fines
Hydraulic Conductivity (m/sec) 10^{-8} 10^{-6} 10^{-4} 10^{-2}
Core Recovery 20 40 60 80
Moisture Content & SPT N
W_P% W% W_L% 20 40 60 80

(Continued on next page)

Survey Method : Handheld GPS
Co-ordinates (m) : 685,639.E, 5,609,914.N
Ground Elevation (m) : 936
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste Track Rig
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/SPT/Diamond
Core : HQ3
Fluid : water
Casing : HW **Cased To (m)** : 30.25

Start Date : 07 Feb 11
Finish Date : 09 Feb 11
Final Depth of Hole (m): : 40.6
Depth to Top of Rock (m) : 29.25
Logged by : MM
Reviewed by : HWN

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details	DCT Blows per 300mm	SPT Blows per 150mm
8							
9		M6					10 15 21
10							
		M7		GRAVEL (GW) Sandy, some silt, dense, well graded, subangular to subrounded, homogeneous, brown, damp. [TILL]			12 22 32
11							
12		M8					12 21 24
13							
		M9					17 27 28
14							
15		M10		15.00 m - SPT sampler is wet on outer edge, trace to some clay, moist			10 16 18
16							

Su - kPa: 40, 80, 120, 160
VANE PEAK / REMOLD — FIELD ◆ ■ — LAB ◇ □
▲ UC/2
△ Pocket Pen /2
★ % Fines
Hydraulic Conductivity (m/sec) 10^{-8} 10^{-6} 10^{-4} 10^{-2}
DCT (blows/300mm)
● SPT (blows/300mm)
Core Recovery 20 40 60 80
Moisture Content & SPT N
W_P% W% W_L% 20 40 60 80

(Continued on next page)

Survey Method : Handheld GPS
Co-ordinates (m) : 685,639.E, 5,609,914.N
Ground Elevation (m) : 936
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste Track Rig
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/SPT/Diamond
Core : HQ3
Fluid : water
Casing : HW **Cased To (m)** : 30.25

Start Date : 07 Feb 11
Finish Date : 09 Feb 11
Final Depth of Hole (m): : 40.6
Depth to Top of Rock (m) : 29.25
Logged by : MM
Reviewed by : HWN

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details	DCT Blows per 300mm	SPT Blows per 150mm
16							
				GRAVEL (GM) Silty, some sand, trace clay, dense, well graded, subangular to subrounded, homogeneous, brown, moist. [TILL]			9 18 28
17		M11					
18				18.10 m - silt content increases, some clay			10 21 19
		M12					
19							
				19.60 - 20.05 m - silty sand zone, some gravel to gravelly			9 15 19
20		M13					
21							
		M14					17 34 46
22							
				SAND (SM) and SILT Fine grained, some gravel, trace clay, dense to very dense, poorly graded, homogeneous, sub angular to subrounded, moist, brown. [TILL]			22 26 38
23		M15					
24							

Su - kPa: 40, 80, 120, 160
VANE PEAK / REMOLD — FIELD ◆ ◇ — LAB ■ □
▲ UC/2
△ Pocket Pen /2
★ % Fines
Hydraulic Conductivity (m/sec) 10^{-8} 10^{-6} 10^{-4} 10^{-2}
DCT (blows/300mm)
● SPT (blows/300mm)
Core Recovery 20 40 60 80
Moisture Content & SPT N
W_P% W% W_L% 20 40 60 80

(Continued on next page)

Survey Method : Handheld GPS
Co-ordinates (m) : 685,639.E, 5,609,914.N
Ground Elevation (m) : 936
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste Track Rig
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/SPT/Diamond
Core : HQ3
Fluid : water
Casing : HW **Cased To (m)** : 30.25

Start Date : 07 Feb 11
Finish Date : 09 Feb 11
Final Depth of Hole (m): : 40.6
Depth to Top of Rock (m) : 29.25
Logged by : MM
Reviewed by : HWN

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details	DCT Blows per 300mm	SPT Blows per 150mm
24							
		M16		24.15 m - some clay, sand and silt/clay appear to be laminated			10 15 19
25							
		M17					11 19 28
26							
27							
		M18					13 23 31
28							
		M19		SAND (SM) Fine grained, silty, some gravel to gravelly (angular, bluish grey, crushed rock?), some clay, well graded, dense, homogeneous, brown, moist.			11 16 25
29				Rock encountered at 29.25 m depth. See DH-BGC11-ED-11 rock log.			
30							
31							
32							

Su - kPa: 40, 80, 120, 160
VANE FIELD LAB: PEAK, REMOLD
UC/2
Pocket Pen /2
★ % Fines
Hydraulic Conductivity (m/sec): 10^{-8} 10^{-6} 10^{-4} 10^{-2}
DCT (blows/300mm)
SPT (blows/300mm)
Core Recovery: 20 40 60 80
Moisture Content & SPT N: W_P% W% W_L%: 20 40 60 80

DRILL HOLE # DH-BGC11-ED-11

CO-ORDINATES : 685,639.E, 5,609,914.N
GROUND ELEVATION (m) : 936
SURVEY METHOD :Handheld GPS
DATUM : NAD83
PLUNGE (°) : 90
TREND (°) : -

DRILL DESIGNATION : Fraste Track Rig
DRILLING CONTRACTOR : Geotech Drilling
DRILL METHOD : ODEX/SPT/Diamond
CORE SIZE : HQ3
FLUID : water
CASED TO (m): 30.25

START DATE : 07 Feb 11
FINISH DATE : 09 Feb 11
FINAL DEPTH (m) : 40.6
DEPTH TO TOP OF ROCK (m) : 29.3
LOGGED BY : MM
REVIEWED BY : HWN

DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION
24			0 to 29.25 m - See DH-BGC11-ED-11 soil log.
25			
26			
27			
28			
29			
30			BEDROCK Volcanic, bluish greenish grey, fine grained, massive, medium strong (R3), slightly weathered (W2), one joint set (65-70° from core axis), joint surfaces are medium strong, trace weak joint walls, close to moderately close spacing, little infill, smooth to rough, several joints along quartz veins. [PICRITE]
31			
32			

CORE RECOVERY %
RQD % — 20 40 60 80

WEATHERING GRADE — 2 3 4 5

POINT LOAD INDEX
Is_{50} ◆
0.1 0.6 1.5 3.0 7.0 (MPa)
STRENGTH GRADE (R)
R1 R2 R3 R4 R5

FRACTURE FREQUENCY (FF/M) — 10 20 30 40

Joint Condition (Jc) — 5 10 15 20

RMR — 20 40 60 80

(CONTINUED ON NEXT PAGE)

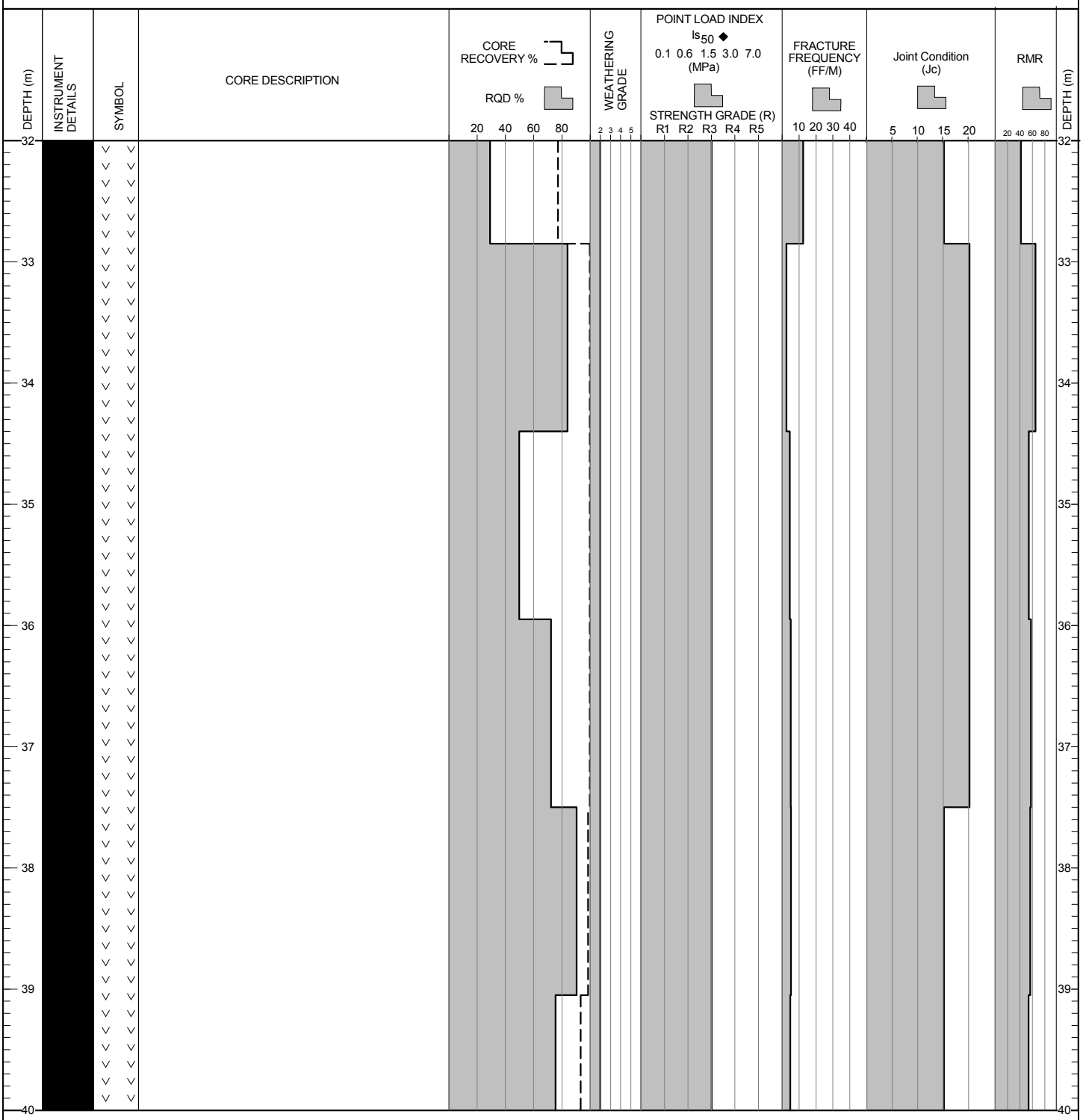
CLIENT: Abacus Mining and Exploration Corporation
PRINT DATE: : 7/26/2011

DRILL HOLE # DH-BGC11-ED-11

CO-ORDINATES : 685,639.E, 5,609,914.N
GROUND ELEVATION (m) : 936
SURVEY METHOD :Handheld GPS
DATUM : NAD83
PLUNGE (°) : 90
TREND (°) : -

DRILL DESIGNATION : Fraste Track Rig
DRILLING CONTRACTOR : Geotech Drilling
DRILL METHOD : ODEX/SPT/Diamond
CORE SIZE : HQ3
FLUID : water
CASED TO (m): 30.25

START DATE : 07 Feb 11
FINISH DATE : 09 Feb 11
FINAL DEPTH (m) : 40.6
DEPTH TO TOP OF ROCK (m) : 29.3
LOGGED BY : MM
REVIEWED BY : HWN



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CLIENT: Abacus Mining and Exploration Corporation
PRINT DATE: : 7/26/2011

DRILL HOLE # DH-BGC11-ED-11

CO-ORDINATES : 685,639.E, 5,609,914.N
GROUND ELEVATION (m) : 936
SURVEY METHOD :Handheld GPS
DATUM : NAD83
PLUNGE (°) : 90
TREND (°) : -

DRILL DESIGNATION : Fraste Track Rig
DRILLING CONTRACTOR : Geotech Drilling
DRILL METHOD : ODEX/SPT/Diamond
CORE SIZE : HQ3
FLUID : water
CASED TO (m): 30.25

START DATE : 07 Feb 11
FINISH DATE : 09 Feb 11
FINAL DEPTH (m) : 40.6
DEPTH TO TOP OF ROCK (m) : 29.3
LOGGED BY : MM
REVIEWED BY : HWN

DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % / RQD % (20 40 60 80) | WEATHERING GRADE (2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / STRENGTH GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (10 20 30 40) | Joint Condition (Jc) (5 10 15 20) | RMR (20 40 60 80) | DEPTH (m)

40

END OF HOLE AT 40.6 m

Notes:
1. 2.5" PVC standpipe piezometer installed.
2. All SPT's completed using auto trip hammer weighing 140 lbs dropped 30 inches
3. Drill hole backfilled with bentonite chips above the piezometer sandpack.
4. Elevation was extracted from DEM

41 42 43 44 45 46 47 48

CLIENT: Abacus Mining and Exploration Corporation
PRINT DATE: : 7/26/2011

Survey Method :
Co-ordinates (m) : 687,511.E, 5,610,358.N
Ground Elevation (m) : 971
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste Track Rig
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/SPT
Core :
Fluid : water
Casing : HW **Cased To (m)** : 39.55

Start Date : 10 Feb 11
Finish Date : 11 Feb 11
Final Depth of Hole (m): : 39.6
Depth to Top of Rock (m) :
Logged by : MM
Reviewed by : HWN

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description
0				Rootmat, topsoil, silty, brown.
				SAND (SP) Fine grained, gravelly, some silt, poorly graded, compact, homogeneous, subangular to subrounded, brown, damp, weak to moderate cementation. [TILL]
1				
		M1		
2				
3				GRAVEL (GW) Sandy, some silt, well graded, dense, homogeneous, subangular to subrounded, brown, damp, weak to moderate cementation. [TILL]
		M2		
4				
		M3		
5				
6				
		M4		
7				
		M5		
8				

Instrument Details

DCT Blows per 300mm

SPT Blows per 150mm: 13, 17, R; 11, 19, 22; 10, 20, 21; 9, 15, 38; 11, 15, 33

Su - kPa (40, 80, 120, 160)
VANE PEAK / REMOLD — FIELD ◆ ◇ — LAB ■ □
UC/2 ▲
Pocket Pen /2 △
DCT (blows/300mm)
SPT (blows/300mm) ●
★ % Fines
Hydraulic Conductivity (m/sec) 10^{-8} 10^{-6} 10^{-4} 10^{-2}
Core Recovery (20, 40, 60, 80)
Moisture Content & SPT N
W_P% W% W_L% (20, 40, 60, 80)

(Continued on next page)

Survey Method :
Co-ordinates (m) : 687,511.E, 5,610,358.N
Ground Elevation (m) : 971
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste Track Rig
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/SPT
Core :
Fluid : water
Casing : HW **Cased To (m)** : 39.55

Start Date : 10 Feb 11
Finish Date : 11 Feb 11
Final Depth of Hole (m): : 39.6
Depth to Top of Rock (m) :
Logged by : MM
Reviewed by : HWN

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details	DCT Blows per 300mm	SPT Blows per 150mm
8							
9		M6		9.05 m - sandy, silty, dense			13 20 R
10							
11		M7					13 35 40
12		M8					14 25 33
13							
14		M9		13.65 m - silty, some sand, dense			12 18 22
15							
16		M10		GRAVEL (GM) Silty, some sand, well graded, compact to dense, homogeneous, subangular to subrounded, greyish brown, damp. [TILL]			8 13 15

Su - kPa: 40, 80, 120, 160
VANE PEAK / REMOLD — FIELD / LAB
▲ UC/2
△ Pocket Pen /2
★ % Fines
Hydraulic Conductivity (m/sec) 10^{-8} 10^{-6} 10^{-4} 10^{-2}
DCT (blows/300mm)
● SPT (blows/300mm)
Core Recovery: 20, 40, 60, 80
Moisture Content & SPT N — W_P% W% W_L%: 20, 40, 60, 80

(Continued on next page)

Survey Method :
Co-ordinates (m) : 687,511.E, 5,610,358.N
Ground Elevation (m) : 971
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste Track Rig
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/SPT
Core :
Fluid : water
Casing : HW **Cased To (m)** : 39.55

Start Date : 10 Feb 11
Finish Date : 11 Feb 11
Final Depth of Hole (m): : 39.6
Depth to Top of Rock (m) :
Logged by : MM
Reviewed by : HWN

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description
16				
17		M11		16.7 m - silt content increases, trace clay
18				
		M12		SAND (SM) Fine grained, gravelly, silty, poorly graded, compact to dense, homogeneous, subangular to subrounded, greyish brown, moist. [TILL]
19				
20		M13		
21				
		M14		GRAVEL (GM) Silty, sandy, well graded, dense, homogeneous, greyish brown, moist, subangular to subrounded. [TILL]
22				
23		M15		
24				

Instrument Details

DCT Blows per 300mm

SPT Blows per 150mm

Depth (m)	SPT Blows per 150mm
17	6 14 21
18	12 21 25
20	13 21 27
22	8 17 23
23	7 16 23

Su - kPa
40 80 120 160
VANE FIELD LAB
PEAK ◆ ■
REMOLD ◇ □
▲ UC/2
△ Pocket Pen /2
★ % Fines
Hydraulic Conductivity (m/sec)
10^{-8} 10^{-6} 10^{-4} 10^{-2}
DCT (blows/300mm)
● SPT (blows/300mm)
Core Recovery
20 40 60 80
Moisture Content & SPT N
W_P% W% W_L%
20 40 60 80

(Continued on next page)

Survey Method :
Co-ordinates (m) : 687,511.E, 5,610,358.N
Ground Elevation (m) : 971
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste Track Rig
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/SPT
Core :
Fluid : water
Casing : HW **Cased To (m)** : 39.55

Start Date : 10 Feb 11
Finish Date : 11 Feb 11
Final Depth of Hole (m): : 39.6
Depth to Top of Rock (m) :
Logged by : MM
Reviewed by : HWN

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details	DCT Blows per 300mm	SPT Blows per 150mm
24							
		M16					8 15 23
25							
		M17		25.90 m - boulder encountered			R
26							
27							
		M18		27.35 m - becomes very dense			20 34 41
28							
29		M19					15 33 36
30							
		M20		GRAVEL (GW) Sandy, some silt, well graded, very dense, homogeneous, greyish brown, subangular to subrounded, moist. [TILL]			26 39 48
31							
32							

Su - kPa: 40, 80, 120, 160
VANE PEAK / FIELD ◆ / LAB ■ / REMOLD ◇ □
▲ UC/2
△ Pocket Pen /2
★ % Fines
Hydraulic Conductivity (m/sec) 10^{-8} 10^{-6} 10^{-4} 10^{-2}
DCT (blows/300mm)
● SPT (blows/300mm)
Core Recovery 20 40 60 80
Moisture Content & SPT N
W_P% W% W_L% 20 40 60 80

(Continued on next page)

Survey Method :
Co-ordinates (m) : 687,511.E, 5,610,358.N
Ground Elevation (m) : 971
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste Track Rig
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/SPT
Core :
Fluid : water
Casing : HW **Cased To (m)** : 39.55

Start Date : 10 Feb 11
Finish Date : 11 Feb 11
Final Depth of Hole (m): : 39.6
Depth to Top of Rock (m) :
Logged by : MM
Reviewed by : HWN

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details	DCT Blows per 300mm	SPT Blows per 150mm
32		M21					18 34 51
33				33.45 - 33.80 m - very moist			
		M22					21 43 R
34							
35		M23		GRAVEL (GM) Silty to and silt, some sand, trace clay, well graded, very dense, homogeneous, subangular to subrounded, brown, moist. [TILL]			17 27 36
36							
		M24		SILT (ML) Some gravel, some sand, trace to some clay, low plasticity, very stiff to hard, greyish brown, moist. [TILL]			12 21 33
37							
38		M25		SAND (SW) Some gravel, trace to some silt, well graded, dry, light brown, homogeneous. [TILL]			R
39							
		M26					R
40				END OF HOLE AT 39.60 m 1. All SPT's completed using an auto trip hammer weighing 140 lbs			

Su - kPa: 40, 80, 120, 160
VANE PEAK / FIELD ◆ / LAB ■ / REMOLD ◇ / □
▲ UC/2
△ Pocket Pen /2
★ % Fines
Hydraulic Conductivity (m/sec) 10^{-8} 10^{-6} 10^{-4} 10^{-2}
DCT (blows/300mm)
● SPT (blows/300mm)
Core Recovery 20 40 60 80
Moisture Content & SPT N
W_P% W% W_L% 20 40 60 80

(Continued on next page)

Survey Method :
Co-ordinates (m) : 687,511.E, 5,610,358.N
Ground Elevation (m) : 971
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste Track Rig
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/SPT
Core :
Fluid : water
Casing : HW **Cased To (m)** : 39.55

Start Date : 10 Feb 11
Finish Date : 11 Feb 11
Final Depth of Hole (m): : 39.6
Depth to Top of Rock (m) :
Logged by : MM
Reviewed by : HWN

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details	DCT Blows per 300mm	SPT Blows per 150mm
40				dropped 30 inches 2. Elevation was extracted from DEM 3. Drill hole backfilled with bentonite chips above the piezometer sandpack.			
41							
42							
43							
44							
45							
46							
47							
48							

Su - kPa: 40, 80, 120, 160
VANE FIELD LAB; PEAK ◆ ■; REMOLD ◇ □
★ % Fines
Hydraulic Conductivity (m/sec) 10^{-8} 10^{-6} 10^{-4} 10^{-2}
Core Recovery 20 40 60 80
▲ UC/2
△ Pocket Pen /2
DCT (blows/300mm)
● SPT (blows/300mm)
Moisture Content & SPT N
W_P% W% W_L%
20 40 60 80

Survey Method : Handheld GPS
Co-ordinates (m) : 687,310.E, 5,609,555.N
Ground Elevation (m) : 882
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste Track Rig
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/SPT
Core :
Fluid :
Casing : HW **Cased To (m)** : 10.65

Start Date : 12 Feb 11
Finish Date : 13 Feb 11
Final Depth of Hole (m): : 10.7
Depth to Top of Rock (m) :
Logged by : MM
Reviewed by : HWN

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details	DCT Blows per 300mm	SPT Blows per 150mm
0				Silty, sandy, rootmat. [TOPSOIL]			
				SAND (SP) Fine grained, trace to some silt, poorly graded, loose, light brown, homogeneous, damp. [TILL]			
1							
2		M1					4 5 6
3		M2		GRAVEL (GM) Silty, some sand to sandy, well graded, dense to very dense, homogeneous, brown, subangular to subrounded, damp. [TILL]			7 19 21
4							
5		M3					18 15 17
6		M4		6.10 - 6.55 m - sandy, some silt			15 28 29
				6.55 - 7.60 m - ODEX went through gravel and sand layer that is the possible source of heavy water infiltration.			
7							
		M5					22 R
8							

Su - kPa: 40, 80, 120, 160
VANE PEAK / REMOLD — FIELD ◆ ◇ — LAB ■ □
▲ UC/2
△ Pocket Pen /2
★ % Fines
Hydraulic Conductivity (m/sec) 10^{-8} 10^{-6} 10^{-4} 10^{-2}
DCT (blows/300mm)
● SPT (blows/300mm)
Core Recovery 20 40 60 80
Moisture Content & SPT N
W_P% W% W_L% 20 40 60 80

(Continued on next page)

Survey Method : Handheld GPS
Co-ordinates (m) : 687,310.E, 5,609,555.N
Ground Elevation (m) : 882
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste Track Rig
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/SPT
Core :
Fluid :
Casing : HW **Cased To (m)** : 10.65

Start Date : 12 Feb 11
Finish Date : 13 Feb 11
Final Depth of Hole (m): : 10.7
Depth to Top of Rock (m) :
Logged by : MM
Reviewed by : HWN

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description
8				
9				SAND (SW) Some silt, some gravel, dry [TILL]
		M6		GRAVEL (GW) Sandy, some silt, hard, well graded, homogeneous, subangular to subrounded, brown, damp. [TILL]
10				Fine sand, dark brown, organic?
				GRAVEL (GW) Sandy, some silt, very dense, well graded, homogeneous, subangular to subrounded, brown, damp. [TILL]
11				END OF HOLE AT 10.65 m
				Notes: 1. Gas seeping from hole. 2. Hole terminated due to unknown gas emissions. 10.7 m of casing left in place. 3. Elevation was extracted from DEM
12				
13				
14				
15				
16				

Instrument Details

DCT Blows per 300mm

SPT Blows per 150mm: 23, 65, 67

Su - kPa: 40, 80, 120, 160
VANE FIELD LAB
PEAK ◆ ■
REMOLD ◇ □
▲ UC/2
△ Pocket Pen /2
★ % Fines
Hydraulic Conductivity (m/sec) 10^{-8} 10^{-6} 10^{-4} 10^{-2}
DCT (blows/300mm)
● SPT (blows/300mm)
Core Recovery 20 40 60 80
Moisture Content & SPT N
W_P% W% W_L% 20 40 60 80

Survey Method :
Co-ordinates (m) : 686,721.E, 5,609,281.N
Ground Elevation (m) : 888
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste Track Rig
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/SPT/Diamond
Core : HQ3
Fluid : water
Casing : HW **Cased To (m)** : 28.70

Start Date : 13 Feb 11
Finish Date : 15 Feb 11
Final Depth of Hole (m): : 38.7
Depth to Top of Rock (m) : 27.00
Logged by : MM
Reviewed by : HWN

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details	DCT Blows per 300mm	SPT Blows per 150mm
0				SAND (SW) Trace to some gravel, loose to compact, well graded, dry, brown. [FILL]			
1							
		M1					8 6 6
2							
3		M2					7 10 9
4							
		M3		SAND (SP) Fine grained, some silt, poorly graded, compact to dense, homogeneous, moist, brown. [FILL] 5.20 - 5.70 m - gravel and sand layer			9 14 18
5							
6		M4		GRAVEL (GP) Sandy (fine), trace silt, poorly graded, very dense, subrounded to subangular, homogeneous, damp, brown. [TILL]			16 26 43
7							
		M5		GRAVEL (GW) Sandy (fine), trace silt, well graded, very dense, homogeneous, subrounded to subangular, brown, damp.			16 28 24
8							

Su - kPa: 40, 80, 120, 160
VANE FIELD LAB: PEAK, REMOLD
UC/2
Pocket Pen /2
DCT (blows/300mm)
SPT (blows/300mm)
★ % Fines
Hydraulic Conductivity (m/sec): 10^{-8} 10^{-6} 10^{-4} 10^{-2}
Core Recovery: 20, 40, 60, 80
Moisture Content & SPT N: W_P% W% W_L%: 20, 40, 60, 80

(Continued on next page)

Survey Method :
Co-ordinates (m) : 686,721.E, 5,609,281.N
Ground Elevation (m) : 888
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste Track Rig
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/SPT/Diamond
Core : HQ3
Fluid : water
Casing : HW **Cased To (m)** : 28.70

Start Date : 13 Feb 11
Finish Date : 15 Feb 11
Final Depth of Hole (m): : 38.7
Depth to Top of Rock (m) : 27.00
Logged by : MM
Reviewed by : HWN

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details	DCT Blows per 300mm	SPT Blows per 150mm
8				[TILL]			
9		M6					28 62 55
10							
		M7					73 R
11							
12		M8		11.95 m - some silt			17 37 48
13							
		M9		13.50 m - sand content increases			20 31 90
14							
15		M10		SAND (SP) Fine grained, some gravel, some silt, poorly graded, very dense, homogeneous, brown, damp. [TILL]			27 40 67
16							

Su - kPa
40 80 120 160
VANE FIELD LAB
PEAK ◆ ■
REMOLD ◇ □
▲ UC/2
△ Pocket Pen /2
★ % Fines
DCT (blows/300mm)
SPT (blows/300mm)
Hydraulic Conductivity (m/sec)
10^{-8} 10^{-6} 10^{-4} 10^{-2}
Core Recovery
20 40 60 80
Moisture Content & SPT N
W_P% W% W_L%
20 40 60 80

(Continued on next page)

Survey Method :
Co-ordinates (m) : 686,721.E, 5,609,281.N
Ground Elevation (m) : 888
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste Track Rig
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/SPT/Diamond
Core : HQ3
Fluid : water
Casing : HW **Cased To (m)** : 28.70

Start Date : 13 Feb 11
Finish Date : 15 Feb 11
Final Depth of Hole (m): : 38.7
Depth to Top of Rock (m) : 27.00
Logged by : MM
Reviewed by : HWN

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details	DCT Blows per 300mm	SPT Blows per 150mm
16							
		M11		16.55 m - silty			19 36 51
17							
18		M12		SILT (ML) Some sand, some gravel, trace clay, low plasticity, hard, homogeneous, brown, damp. [TILL]			19 36 37
19							
		M13					12 26 38
20							
21							
		M14					16 34 45
22							
		M15		Interbedded Layers (30 mm) of SAND (SP) Fine grained, silty, trace gravel, poorly graded, very dense, homogeneous, brown, damp. And SILT (ML) Clayey, trace gravel, hard, homogeneous, damp.			14 30 39
23							
24							

Su - kPa: 40, 80, 120, 160
VANE PEAK / REMOLD — FIELD ◆ ◇ — LAB ■ □
▲ UC/2
△ Pocket Pen /2
★ % Fines
Hydraulic Conductivity (m/sec) 10^{-8} 10^{-6} 10^{-4} 10^{-2}
DCT (blows/300mm)
● SPT (blows/300mm)
Core Recovery 20 40 60 80
Moisture Content & SPT N
W_P% W% W_L% 20 40 60 80

(Continued on next page)

Survey Method :
Co-ordinates (m) : 686,721.E, 5,609,281.N
Ground Elevation (m) : 888
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste Track Rig
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/SPT/Diamond
Core : HQ3
Fluid : water
Casing : HW **Cased To (m)** : 28.70

Start Date : 13 Feb 11
Finish Date : 15 Feb 11
Final Depth of Hole (m): : 38.7
Depth to Top of Rock (m) : 27.00
Logged by : MM
Reviewed by : HWN

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details	DCT Blows per 300mm	SPT Blows per 150mm
24							
		M16		GRAVEL (GM) and SILT Some sand, well graded, very dense, subangular to subrounded, homogeneous, brown, damp. [TILL]			17 31 34
25							
		M17		25.65 m - becomes silty			14 24 41
26							
27				Rock encountered at 27.00 m depth. See DH-BGC11-ED-14 rock log.			
28							
29							
30							
31							
32							

Su - kPa
40 80 120 160
VANE FIELD LAB
PEAK ◆ ■
REMOLD ◇ □
▲ UC/2
△ Pocket Pen /2
★ % Fines
Hydraulic Conductivity (m/sec)
10^{-8} 10^{-6} 10^{-4} 10^{-2}
DCT (blows/300mm)
● SPT (blows/300mm)
Core Recovery
20 40 60 80
Moisture Content & SPT N
W_P% W% W_L%
20 40 60 80

DRILL HOLE # DH-BGC11-ED-14

CO-ORDINATES : 686,721.E, 5,609,281.N
GROUND ELEVATION (m) : 888
SURVEY METHOD :
DATUM : NAD83
PLUNGE (°) : 90
TREND (°) : -

DRILL DESIGNATION : Fraste Track Rig
DRILLING CONTRACTOR : Geotech Drilling
DRILL METHOD : ODEX/SPT/Diamond
CORE SIZE : HQ3
FLUID : water
CASED TO (m): 28.70

START DATE : 13 Feb 11
FINISH DATE : 15 Feb 11
FINAL DEPTH (m) : 38.7
DEPTH TO TOP OF ROCK (m) : 27.0
LOGGED BY : MM
REVIEWED BY : HWN

DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % / RQD % (20 40 60 80)	WEATHERING GRADE (2 3 4 5)	POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / STRENGTH GRADE (R) R1 R2 R3 R4 R5	FRACTURE FREQUENCY (FF/M) (10 20 30 40)	Joint Condition (Jc) (5 10 15 20)	RMR (20 40 60 80)	DEPTH (m)
24										24
25			0 to 27.00 m - See DH-BGC11-ED-14 soil log.							25
26										26
27			BEDROCK Intrusive, greenish grey, fine grained, massive, medium strong (R3), slightly weathered (W2), no discernible joint sets, joint surfaces are medium strong, trace weak joints, smooth to rough, trace iron staining to 28.90 m. [IRON MASK HYBRID]							27
28										28
29			28.70 to 29.55 m - Broken rock, no discernible alpha angles							29
30										30
31										31
32										32

(CONTINUED ON NEXT PAGE)

CLIENT: Abacus Mining and Exploration Corporation
PRINT DATE: : 7/26/2011

PROJECT: Ajax Project Feasibility Study

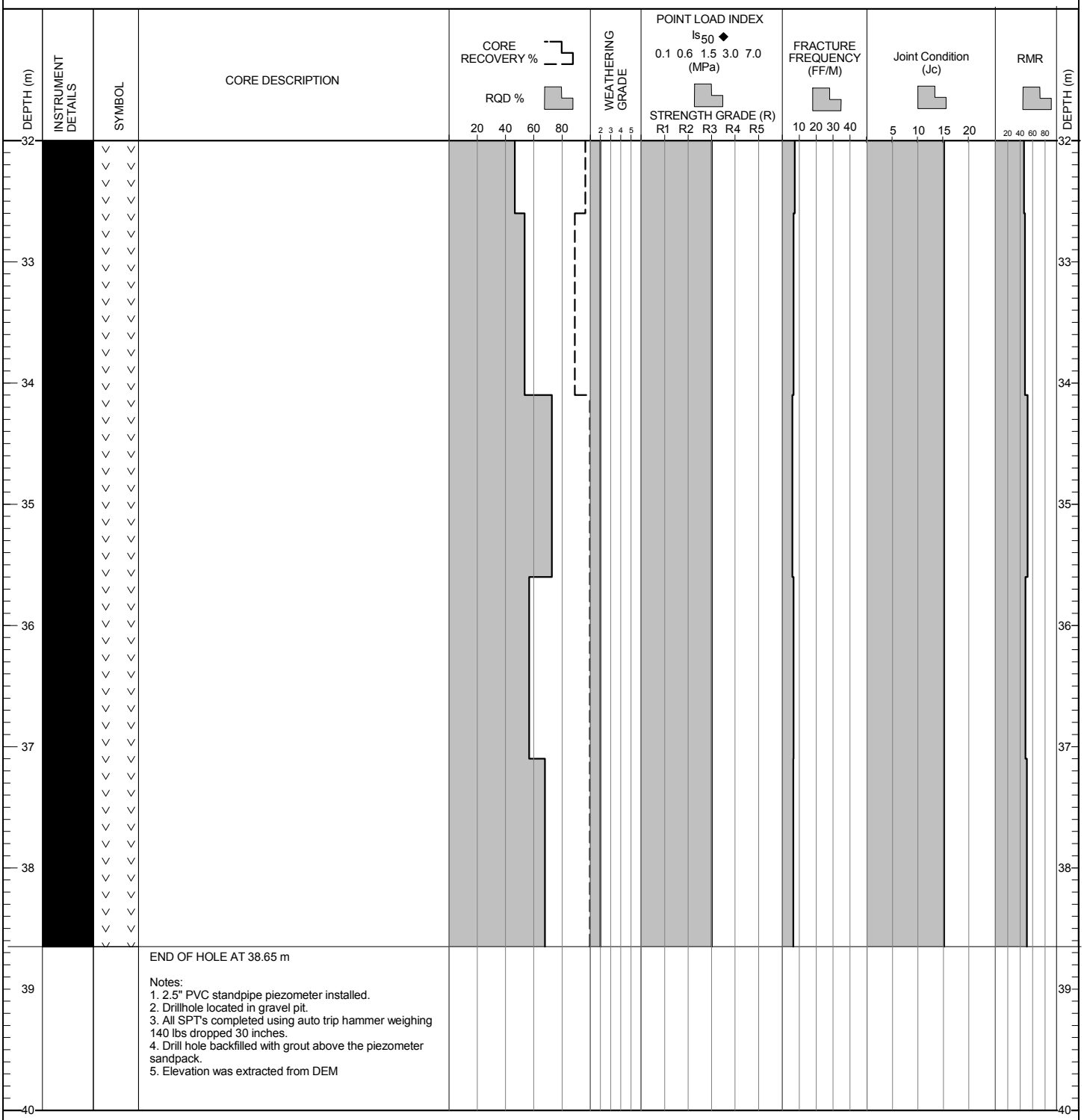
PROJECT NO. : 0712-003

DRILL HOLE # DH-BGC11-ED-14

CO-ORDINATES : 686,721.E, 5,609,281.N
GROUND ELEVATION (m) : 888
SURVEY METHOD :
DATUM : NAD83
PLUNGE (°) : 90
TREND (°) : -

DRILL DESIGNATION : Fraste Track Rig
DRILLING CONTRACTOR : Geotech Drilling
DRILL METHOD : ODEX/SPT/Diamond
CORE SIZE : HQ3
FLUID : water
CASED TO (m): 28.70

START DATE : 13 Feb 11
FINISH DATE : 15 Feb 11
FINAL DEPTH (m) : 38.7
DEPTH TO TOP OF ROCK (m) : 27.0
LOGGED BY : MM
REVIEWED BY : HWN



CLIENT: Abacus Mining and Exploration Corporation

PRINT DATE: : 7/26/2011

Survey Method :
Co-ordinates (m) : 685,999.E, 5,610,569.N
Ground Elevation (m) : 963
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste Track Rig
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/SPT/Diamond
Core : HQ3
Fluid : water
Casing : HW **Cased To (m)** : 9.15

Start Date : 15 Feb 11
Finish Date : 16 Feb 11
Final Depth of Hole (m): : 19.1
Depth to Top of Rock (m) : 8.70
Logged by : MM
Reviewed by : HWN

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description
0				Silty, rootlets, dark brown. [TOPSOIL]
				GRAVEL (GM) Silty, some sand, trace clay, well graded, compact, homogeneous, subangular to subrounded, brown, dry. [TILL]
1				
2		M1		
3		M2		3.05 m - becomes moist.
4				
5		M3		SILT (ML) Some clay, some gravel, trace sand, firm to stiff, low plasticity, homogeneous, moist, brown. [TILL]
6		M4		6.10 m - Grain Size Analysis: 23% Gravel, 35% Sand, 31% Silt, 11% Clay
7				GRAVEL (GM) Silty, some sand, trace clay, well graded, very dense, homogeneous, subangular to subrounded, brown, moist. [TILL]
8		M5		

Instrument Details

DCT Blows per 300mm

SPT Blows per 150mm: 16, 23, 23 | 8, 11, 13 | 9, 12, 15 | 4, 7, 8 | 13, 30, R

Su - kPa (40, 80, 120, 160)
VANE PEAK / FIELD ◆ / LAB ■
REMOLD ◇ / □
UC/2 ▲
Pocket Pen /2 △
DCT (blows/300mm)
SPT (blows/300mm) ●
★ % Fines
Hydraulic Conductivity (m/sec) 10^{-8} 10^{-6} 10^{-4} 10^{-2}
Core Recovery (20, 40, 60, 80)
Moisture Content & SPT N
W_P% W% W_L% (20, 40, 60, 80)

(Continued on next page)

Survey Method :
Co-ordinates (m) : 685,999.E, 5,610,569.N
Ground Elevation (m) : 963
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste Track Rig
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/SPT/Diamond
Core : HQ3
Fluid : water
Casing : HW **Cased To (m)** : 9.15

Start Date : 15 Feb 11
Finish Date : 16 Feb 11
Final Depth of Hole (m): : 19.1
Depth to Top of Rock (m) : 8.70
Logged by : MM
Reviewed by : HWN

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details	DCT Blows per 300mm	SPT Blows per 150mm
8							
				Rock encountered at 8.70 m depth. See DH-BGC11-ED-15 rock log.			
9							
10							
11							
12							
13							
14							
15							
16							

Su - kPa
40 80 120 160
VANE FIELD LAB
PEAK ◆ ■
REMOLD ◇ □
▲ UC/2
△ Pocket Pen /2
★ % Fines
Hydraulic Conductivity (m/sec)
10^{-8} 10^{-6} 10^{-4} 10^{-2}
DCT (blows/300mm)
● SPT (blows/300mm)
Core Recovery
20 40 60 80
Moisture Content & SPT N
W_P% W% W_L%
20 40 60 80

DRILL HOLE # DH-BGC11-ED-15

CO-ORDINATES : 685,999.E, 5,610,569.N
GROUND ELEVATION (m) : 963
SURVEY METHOD :
DATUM : NAD83
PLUNGE (°) : 90
TREND (°) : -

DRILL DESIGNATION : Fraste Track Rig
DRILLING CONTRACTOR : Geotech Drilling
DRILL METHOD : ODEX/SPT/Diamond
CORE SIZE : HQ3
FLUID : water
CASED TO (m): 9.15

START DATE : 15 Feb 11
FINISH DATE : 16 Feb 11
FINAL DEPTH (m) : 19.1
DEPTH TO TOP OF ROCK (m) : 8.7
LOGGED BY : MM
REVIEWED BY : HWN

DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION
8			0 to 8.70 m - See DH-BGC11-ED-15 soil log.
9			BEDROCK Intrusive, greenish grey, fine grained, massive, medium strong (R3), slightly weathered (W2), two joint sets (40-50°, 55-65° from core axis), discontinuity surfaces are medium strong, trace weak joint surfaces, close spacing, smooth to rough, trace quartz veins and joints along quartz veins. [IRON MASK HYBRID]
10			
11			
12			
13			
14			
15			
16			15.60 to 16.05 m - Broken rock, 3-10cm blocks

CORE RECOVERY %
RQD % 20 40 60 80

WEATHERING GRADE 2 3 4 5

POINT LOAD INDEX Is_{50} ◆
0.1 0.6 1.5 3.0 7.0 (MPa)
STRENGTH GRADE (R) R1 R2 R3 R4 R5

FRACTURE FREQUENCY (FF/M) 10 20 30 40

Joint Condition (Jc) 5 10 15 20

RMR 20 40 60 80

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CLIENT: Abacus Mining and Exploration Corporation
PRINT DATE: : 7/26/2011

PROJECT: Ajax Project Feasibility Study

PROJECT NO. : 0712-003

DRILL HOLE # DH-BGC11-ED-15

CO-ORDINATES : 685,999.E, 5,610,569.N
GROUND ELEVATION (m) : 963
SURVEY METHOD :
DATUM : NAD83
PLUNGE (°) : 90
TREND (°) : -

DRILL DESIGNATION : Fraste Track Rig
DRILLING CONTRACTOR : Geotech Drilling
DRILL METHOD : ODEX/SPT/Diamond
CORE SIZE : HQ3
FLUID : water
CASED TO (m): 9.15

START DATE : 15 Feb 11
FINISH DATE : 16 Feb 11
FINAL DEPTH (m) : 19.1
DEPTH TO TOP OF ROCK (m) : 8.7
LOGGED BY : MM
REVIEWED BY : HWN

DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION
16			
17			
18			
19			18.50 to 19.10 m - Broken rock, 3 - 10cm blocks
20			END OF HOLE AT 19.10 m Notes: 1. 2.5" PVC standpipe piezometer installed 2. All SPT's completed using an auto trip hammer weighing 140 lbs dropped from 30 inches 3. Drill hole backfilled with bentonite chips above the piezometer sandpack. 4. Elevation was extracted from DEM
21			
22			
23			
24			

CORE RECOVERY %
RQD % — 20 40 60 80

WEATHERING GRADE — 2 3 4 5

POINT LOAD INDEX
Is_{50} ◆
0.1 0.6 1.5 3.0 7.0 (MPa)
STRENGTH GRADE (R)
R1 R2 R3 R4 R5

FRACTURE FREQUENCY (FF/M) — 10 20 30 40

Joint Condition (Jc) — 5 10 15 20

RMR — 20 40 60 80

CLIENT: Abacus Mining and Exploration Corporation

PRINT DATE: : 7/26/2011

Survey Method : Handheld GPS
Co-ordinates (m) : 686,295.E, 5,608,160.N
Ground Elevation (m) : 991
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste Track Rig
Drilling Contractor : Geotech Drilling Ltd
Drill Method : ODEX/SPT/Diamond
Core : HQ3
Fluid : water
Casing : HW **Cased To (m)** : 21.35

Start Date : 17 Feb 11
Finish Date : 20 Feb 11
Final Depth of Hole (m): : 31.2
Depth to Top of Rock (m) : 20.40
Logged by : MM
Reviewed by : HWN

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details	DCT Blows per 300mm	SPT Blows per 150mm
0				Rootmat, grass, silty [TOPSOIL]			
				GRAVEL (GW) Some silt, some sand, some cobbles, well graded, dense, homogeneous, sub-angular to sub-rounded, dry to damp, brown. [TILL]			
1		M1					24 17 R
		M2					16 25 31
2							
		M3		GRAVEL (GM) Silty, some sand, well graded, dense, sub-angular to sub-rounded, brown, damp. [TILL]			16 20 24
3							
		M4		SAND (SM) Fine grained, silty, some gravel to gravelly, poorly graded, dense to very dense, homogeneous, brown, damp. [TILL]			12 17 28
4		M5					19 25 31
		M6		GRAVEL (GW) Sandy, some silt, well graded, dense, homogeneous, sub-angular to sub-rounded, brown, damp. [TILL] 4.55 m - Grain Size Analysis: 32% Gravel, 28% Sand, 40% Fines			15 17 23
5		M7					13 21 20
6		M8					11 15 20
7		M9					12 16 20
		M10					10 15 20
8							

Su - kPa
40 80 120 160
VANE FIELD LAB
PEAK ◆ ■
REMOLD ◇ □
▲ UC/2
△ Pocket Pen /2
★ % Fines
Hydraulic Conductivity (m/sec)
10^{-8} 10^{-6} 10^{-4} 10^{-2}
DCT (blows/300mm)
● SPT (blows/300mm)
Core Recovery
20 40 60 80
Moisture Content & SPT N
W_P% W% W_L%
20 40 60 80

(Continued on next page)

Survey Method : Handheld GPS
Co-ordinates (m) : 686,295.E, 5,608,160.N
Ground Elevation (m) : 991
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste Track Rig
Drilling Contractor : Geotech Drilling Ltd
Drill Method : ODEX/SPT/Diamond
Core : HQ3
Fluid : water
Casing : HW **Cased To (m)** : 21.35

Start Date : 17 Feb 11
Finish Date : 20 Feb 11
Final Depth of Hole (m): : 31.2
Depth to Top of Rock (m) : 20.40
Logged by : MM
Reviewed by : HWN

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details	DCT Blows per 300mm	SPT Blows per 150mm
8							
		M11					8 13 16
9		M12					10 14 19
10		M13					14 20 25
		M14		SAND (SM) Fine grained, silty, gravelly, well graded, dense to very dense, homogeneous, brown, damp. [TILL]			15 39 56
11		M15					10 17 21
12		M16		SILT (ML) Sandy, some gravel, low plasticity, stiff to hard, homogeneous, brown, damp. [TILL] 12.20 m - Grain Size Analysis: 17% Gravel, 33% Sand, 37% Silt, 13% Clay			8 13 14
13		M17					7 11 15
14		M18					8 12 17
		M19		SAND (SM) Fine grained, silty, some gravel, well graded, very dense, homogeneous, sub-angular to sub-rounded, brown, damp. [TILL]			16 29 R
15		M20					R
16				GRAVEL (GW)			

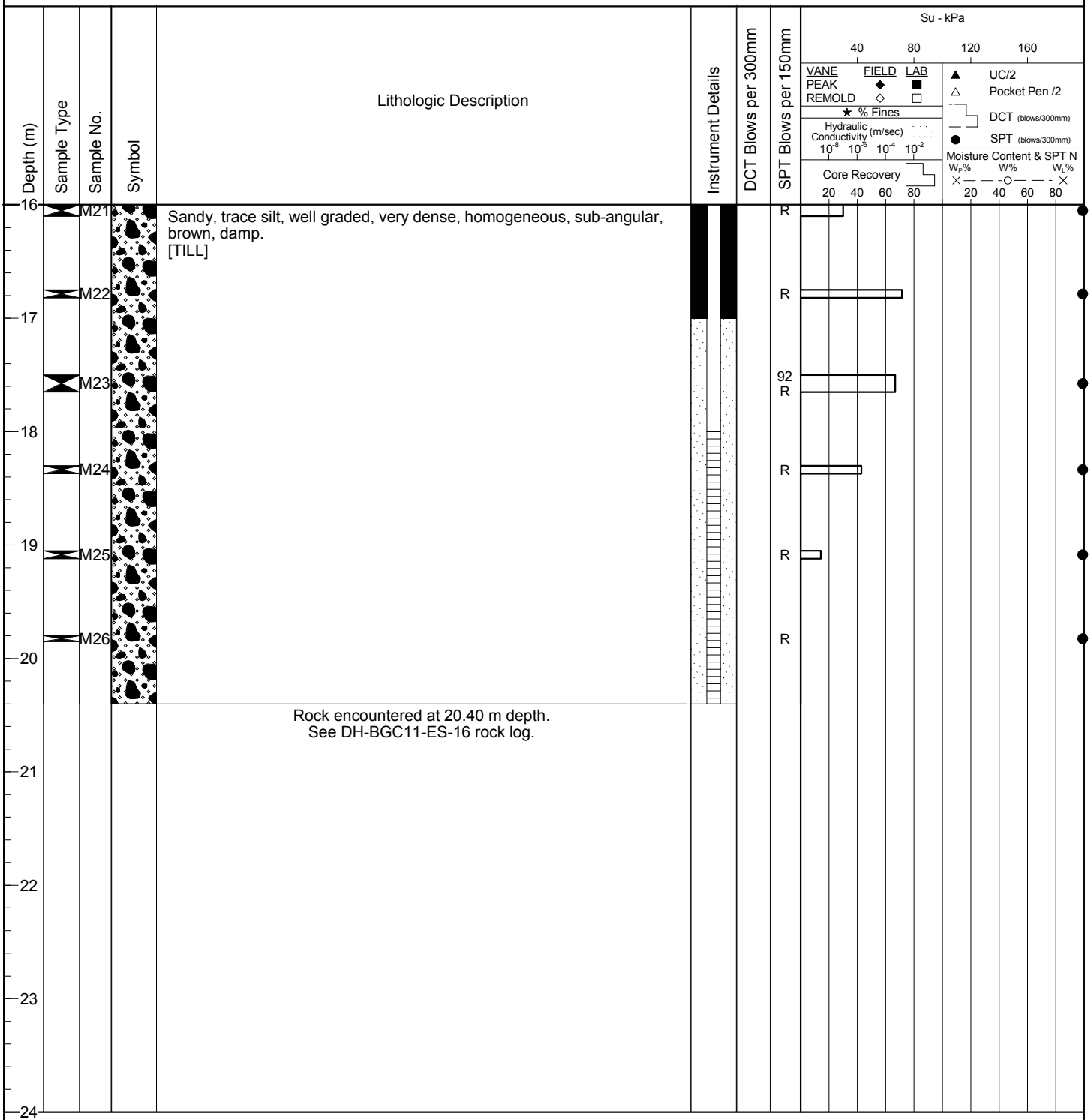
Su - kPa: 40, 80, 120, 160
VANE PEAK / FIELD ◆ / LAB ■ / REMOLD ◇ / □
▲ UC/2
△ Pocket Pen /2
★ % Fines
Hydraulic Conductivity (m/sec) 10^{-8} 10^{-6} 10^{-4} 10^{-2}
DCT (blows/300mm)
● SPT (blows/300mm)
Core Recovery 20 40 60 80
Moisture Content & SPT N
W_P% W% W_L% 20 40 60 80

(Continued on next page)

Survey Method : Handheld GPS
Co-ordinates (m) : 686,295.E, 5,608,160.N
Ground Elevation (m) : 991
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste Track Rig
Drilling Contractor : Geotech Drilling Ltd
Drill Method : ODEX/SPT/Diamond
Core : HQ3
Fluid : water
Casing : HW **Cased To (m)** : 21.35

Start Date : 17 Feb 11
Finish Date : 20 Feb 11
Final Depth of Hole (m): : 31.2
Depth to Top of Rock (m) : 20.40
Logged by : MM
Reviewed by : HWN



PROJECT: Ajax Project Feasibility Study
PROJECT NO. : 0712-003

DRILL HOLE # DH-BGC11-ES-16

CO-ORDINATES : 686,295.E, 5,608,160.N
GROUND ELEVATION (m) : 991
SURVEY METHOD :Handheld GPS
DATUM : NAD83
PLUNGE (°) : 90
TREND (°) : n/a

DRILL DESIGNATION : Fraste Track Rig
DRILLING CONTRACTOR : Geotech Drilling Ltd
DRILL METHOD : ODEX/SPT/Diamond
CORE SIZE : HQ3
FLUID : water
CASED TO (m): 21.35

START DATE : 17 Feb 11
FINISH DATE : 20 Feb 11
FINAL DEPTH (m) : 31.2
DEPTH TO TOP OF ROCK (m) : 20.4
LOGGED BY : MM
REVIEWED BY : HWN

DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % / RQD % (20 40 60 80)	WEATHERING GRADE (2 3 4 5)	POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / STRENGTH GRADE (R) R1 R2 R3 R4 R5	FRACTURE FREQUENCY (FF/M) (10 20 30 40)	Joint Condition (Jc) (5 10 15 20)	RMR (20 40 60 80)	DEPTH (m)
16										16
17										17
18			0 to 20.40 m - See DH-BGC11-ES-16 soil log.							18
19										19
20										20
21			BEDROCK Volcanic, greenish grey, fine grained, massive, medium strong (R3), slightly weathered (W2), three joint sets (15-20°, 30-40°, 55-60° from core axis), joint surfaces are medium strong, close spacing, smooth to rough. [VOLCANIC BRECCIA]							21
22										22
23										23
24										24

(CONTINUED ON NEXT PAGE)

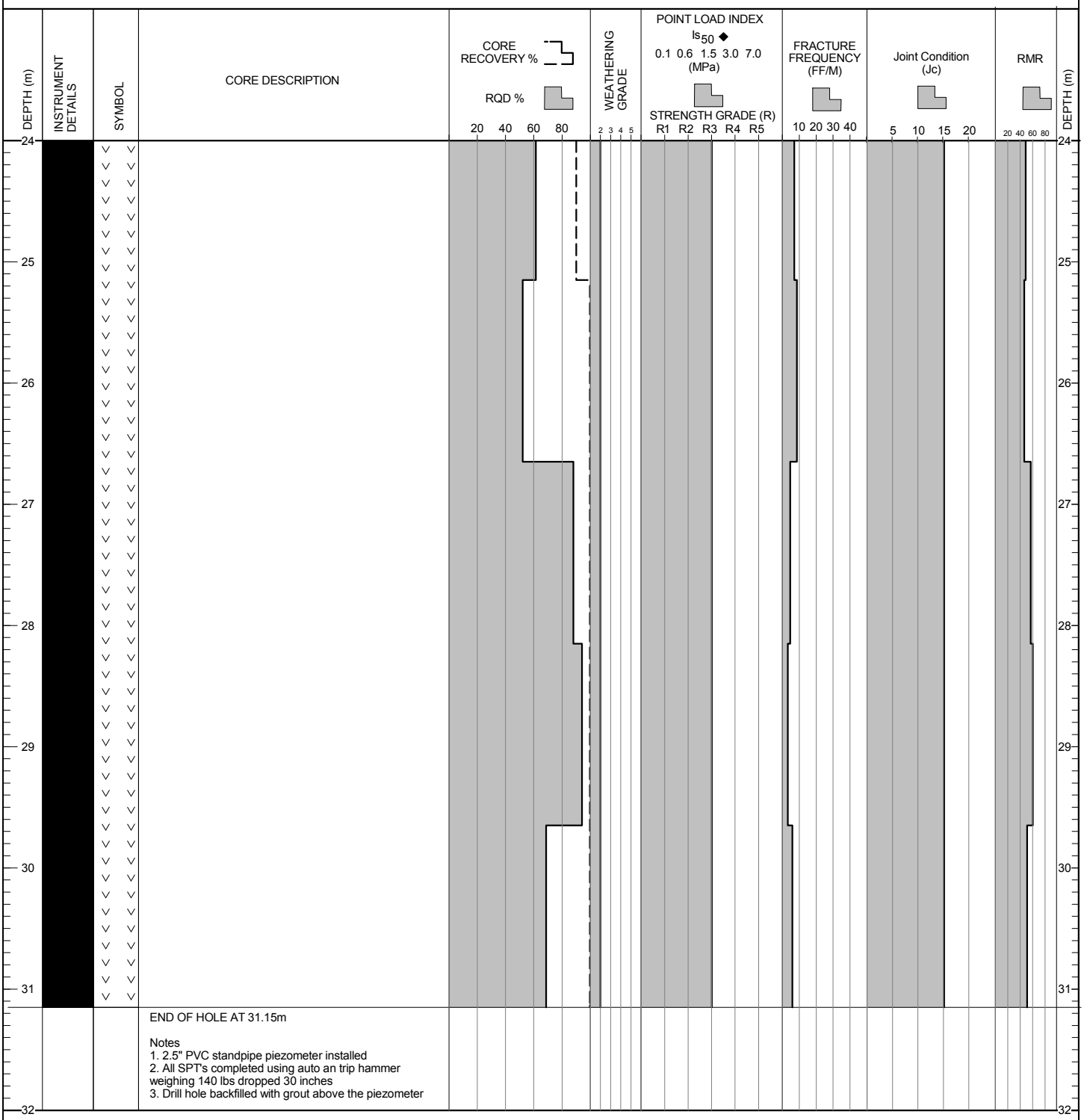
CLIENT: Abacus Mining and Exploration Corporation
PRINT DATE: : 7/26/2011

DRILL HOLE # DH-BGC11-ES-16

CO-ORDINATES : 686,295.E, 5,608,160.N
GROUND ELEVATION (m) : 991
SURVEY METHOD :Handheld GPS
DATUM : NAD83
PLUNGE (°) : 90
TREND (°) : n/a

DRILL DESIGNATION : Fraste Track Rig
DRILLING CONTRACTOR : Geotech Drilling Ltd
DRILL METHOD : ODEX/SPT/Diamond
CORE SIZE : HQ3
FLUID : water
CASED TO (m): 21.35

START DATE : 17 Feb 11
FINISH DATE : 20 Feb 11
FINAL DEPTH (m) : 31.2
DEPTH TO TOP OF ROCK (m) : 20.4
LOGGED BY : MM
REVIEWED BY : HWN



END OF HOLE AT 31.15m

Notes
1. 2.5" PVC standpipe piezometer installed
2. All SPT's completed using auto an trip hammer weighing 140 lbs dropped 30 inches
3. Drill hole backfilled with grout above the piezometer

(CONTINUED ON NEXT PAGE)

CLIENT: Abacus Mining and Exploration Corporation
PRINT DATE: : 7/26/2011

DRILL HOLE # DH-BGC11-ES-16

CO-ORDINATES : 686,295.E, 5,608,160.N
GROUND ELEVATION (m) : 991
SURVEY METHOD :Handheld GPS
DATUM : NAD83
PLUNGE (°) : 90
TREND (°) : n/a

DRILL DESIGNATION : Fraste Track Rig
DRILLING CONTRACTOR : Geotech Drilling Ltd
DRILL METHOD : ODEX/SPT/Diamond
CORE SIZE : HQ3
FLUID : water
CASED TO (m): 21.35

START DATE : 17 Feb 11
FINISH DATE : 20 Feb 11
FINAL DEPTH (m) : 31.2
DEPTH TO TOP OF ROCK (m) : 20.4
LOGGED BY : MM
REVIEWED BY : HWN

DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % / RQD % (20 40 60 80)	WEATHERING GRADE (2 3 4 5)	POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / STRENGTH GRADE (R) R1 R2 R3 R4 R5	FRACTURE FREQUENCY (FF/M) (10 20 30 40)	Joint Condition (Jc) (5 10 15 20)	RMR (20 40 60 80)	DEPTH (m)
32			sandpack. 4. Elevation was extracted from DEM							32
33										33
34										34
35										35
36										36
37										37
38										38
39										39
40										40

CLIENT: Abacus Mining and Exploration Corporation
PRINT DATE: : 7/26/2011

Survey Method : hand held
Co-ordinates (m) : 684,321.E, 5,610,507.N
Ground Elevation (m) : 979
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste Track Rig
Drilling Contractor : Geotech Drilling
Drill Method : Diamond
Core : HQ3
Fluid : water
Casing : HW **Cased To (m)** : 17.22

Start Date : 22 Feb 11
Finish Date : 24 Feb 11
Final Depth of Hole (m): : 27.8
Depth to Top of Rock (m) : 17.22
Logged by : LGT
Reviewed by : HWN

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details	DCT Blows per 300mm	SPT Blows per 150mm
0		M1		GRAVEL (GW) and BOULDERS Trace to some sand, trace to some silt, poorly to well graded, loose, max particle size = at least 640 mm (boulders), particles are elongated, mainly angular, grey to greyish brown, moist, homogeneous, no cementation. Clasts in matrix are R2-R3, W2. Boulders are medium grained, light grey, vesicular, R3-R4, W1. [FILL]			R
1							
		M2					16 34 R
2							
3		M3					9 10 10
4							
		M4					7 14 8
5							
6		M5					18 16 R
7							
		M6		7.50 m - Grain Size Analysis: 62% Gravel, 30% Sand, 8% Fines			9 11 ★
8							

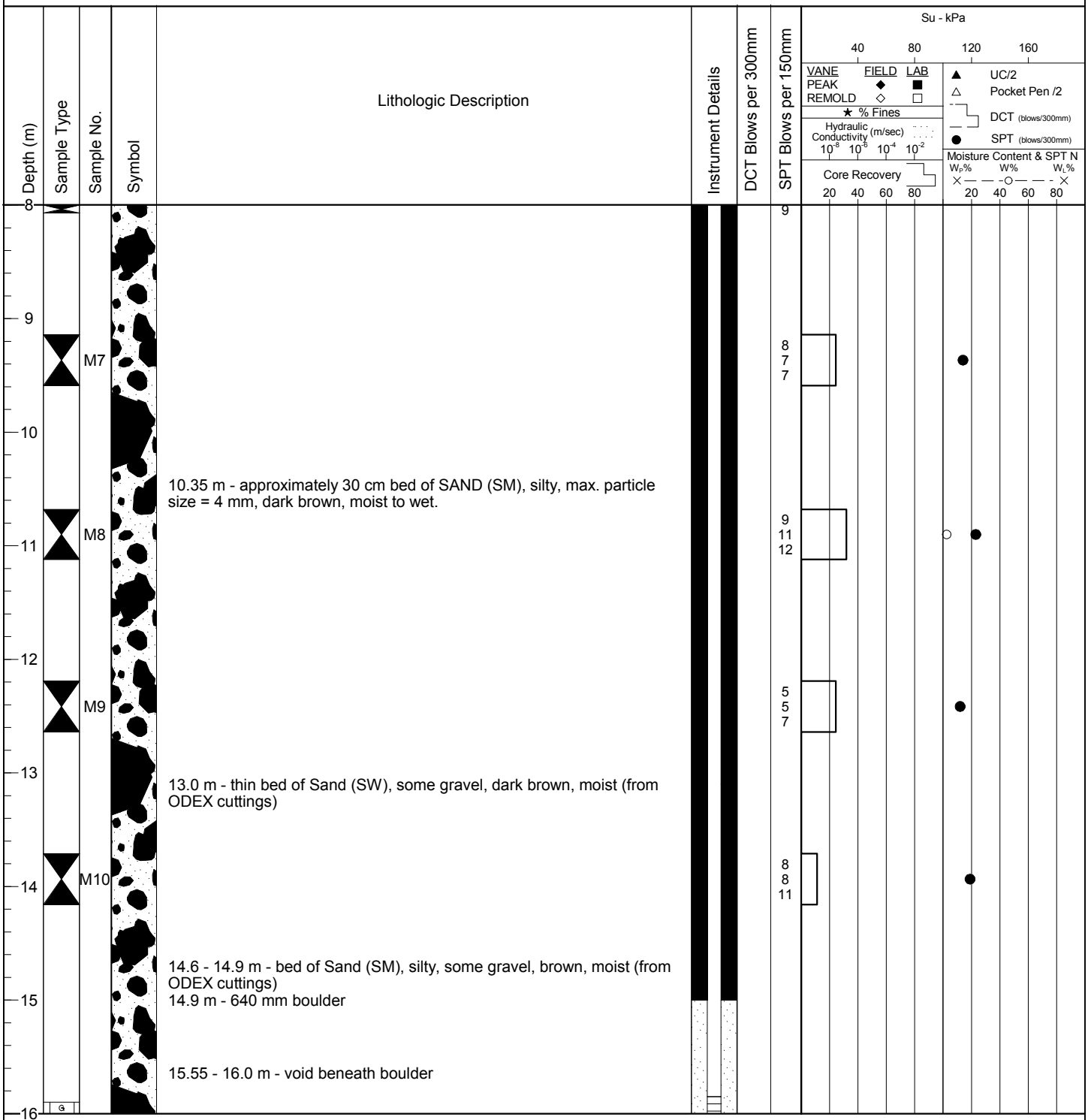
Su - kPa: 40, 80, 120, 160
VANE PEAK / REMOLD — FIELD ◆ ◇ — LAB ■ □
▲ UC/2
△ Pocket Pen /2
★ % Fines
DCT (blows/300mm)
SPT (blows/300mm)
Hydraulic Conductivity (m/sec) 10^{-8} 10^{-6} 10^{-4} 10^{-2}
Core Recovery 20 40 60 80
Moisture Content & SPT N: W_P% W% W_L% — 20 40 60 80

(Continued on next page)

Survey Method : hand held
Co-ordinates (m) : 684,321.E, 5,610,507.N
Ground Elevation (m) : 979
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste Track Rig
Drilling Contractor : Geotech Drilling
Drill Method : Diamond
Core : HQ3
Fluid : water
Casing : HW **Cased To (m)** : 17.22

Start Date : 22 Feb 11
Finish Date : 24 Feb 11
Final Depth of Hole (m): : 27.8
Depth to Top of Rock (m) : 17.22
Logged by : LGT
Reviewed by : HWN



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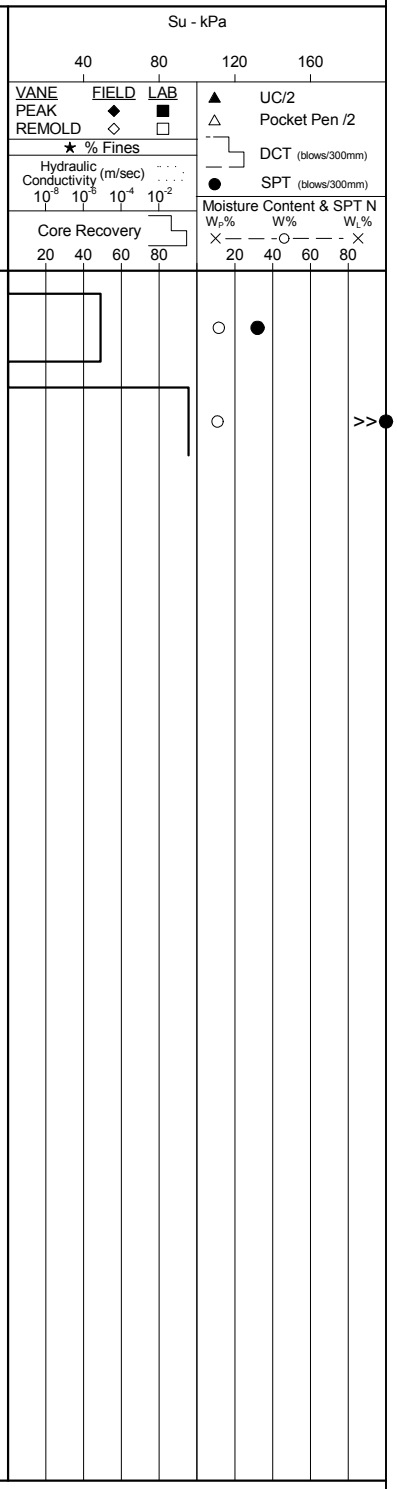
Survey Method : hand held
Co-ordinates (m) : 684,321.E, 5,610,507.N
Ground Elevation (m) : 979
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste Track Rig
Drilling Contractor : Geotech Drilling
Drill Method : Diamond
Core : HQ3
Fluid : water
Casing : HW **Cased To (m)** : 17.22

Start Date : 22 Feb 11
Finish Date : 24 Feb 11
Final Depth of Hole (m): : 27.8
Depth to Top of Rock (m) : 17.22
Logged by : LGT
Reviewed by : HWN

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details	DCT Blows per 300mm	SPT Blows per 150mm
16	G	S1		SAND (SM) Silty, gravelly, well graded, compact, max. particle size = 25 mm, elongated, angular to sub-angular, moist, dark brown, homogeneous. Clasts are greenish yellow, grey with red speckled, greenish grey, R2-R3.			6 10 22
		M11					
17		M12		16.77 m - max particle size 35 mm			12 12 R
				Rock encountered at 17.22 m depth. See DH-BGC11-WC-17 rock log.			
18							
19							
20							
21							
22							
23							
24							



DRILL HOLE # DH-BGC11-WC-17

CO-ORDINATES : 684,321.E, 5,610,507.N
GROUND ELEVATION (m) : 979
SURVEY METHOD :hand held
DATUM : NAD83
PLUNGE (°) : 90
TREND (°) : n/a

DRILL DESIGNATION : Fraste Track Rig
DRILLING CONTRACTOR : Geotech Drilling
DRILL METHOD : Diamond
CORE SIZE : HQ3
FLUID : water
CASED TO (m): 17.22

START DATE : 22 Feb 11
FINISH DATE : 24 Feb 11
FINAL DEPTH (m) : 27.8
DEPTH TO TOP OF ROCK (m) : 17.2
LOGGED BY : LGT
REVIEWED BY : HWN

DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % / RQD % (20 40 60 80) | WEATHERING GRADE (2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / STRENGTH GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (10 20 30 40) | Joint Condition (Jc) (5 10 15 20) | RMR (20 40 60 80) | DEPTH (m)

16

0 to 17.22 m - See DH-BGC11-WC-17 soil log.

17

BEDROCK
Intrusive, greenish grey, fine to medium grained, massive, moderately strong (R3), slightly weathered to fresh (W2-W1), two discontinuity sets (30-35°, 60-75° from core axis), surfaces are medium strong, close spacing, minor chlorite and hematite infill, rough, undulating, small apertures.
[IRON MASK HYBRID]

18 19 20 21 22 23 24

(CONTINUED ON NEXT PAGE)

CLIENT: Abacus Mining and Exploration Corporation
PRINT DATE: : 7/26/2011

PROJECT: Ajax Project Feasibility Study

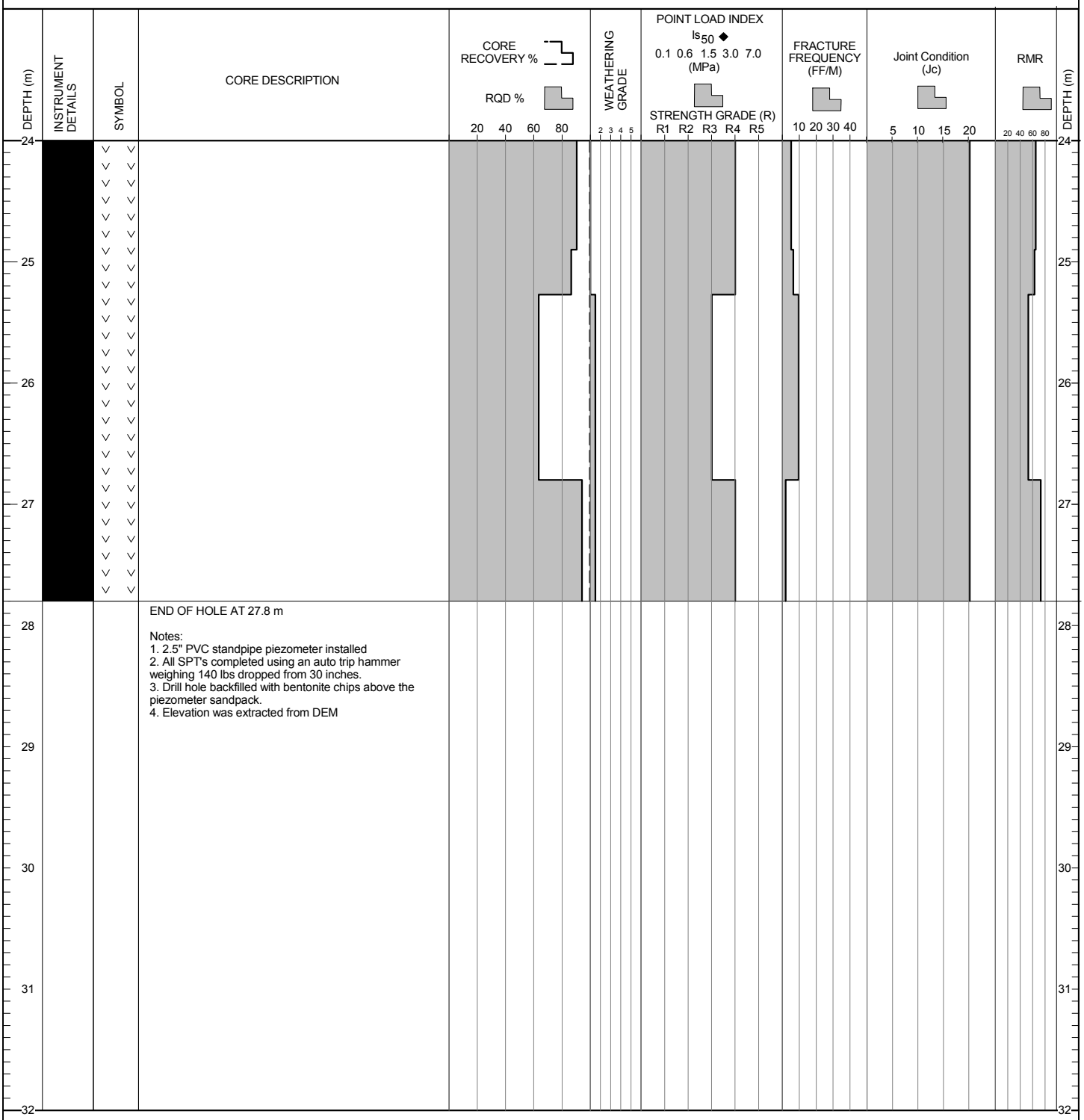
PROJECT NO. : 0712-003

DRILL HOLE # DH-BGC11-WC-17

CO-ORDINATES : 684,321.E, 5,610,507.N
GROUND ELEVATION (m) : 979
SURVEY METHOD :hand held
DATUM : NAD83
PLUNGE (°) : 90
TREND (°) : n/a

DRILL DESIGNATION : Fraste Track Rig
DRILLING CONTRACTOR : Geotech Drilling
DRILL METHOD : Diamond
CORE SIZE : HQ3
FLUID : water
CASED TO (m): 17.22

START DATE : 22 Feb 11
FINISH DATE : 24 Feb 11
FINAL DEPTH (m) : 27.8
DEPTH TO TOP OF ROCK (m) : 17.2
LOGGED BY : LGT
REVIEWED BY : HWN



CLIENT: Abacus Mining and Exploration Corporation

PRINT DATE: : 7/26/2011

Survey Method : Handheld GPS
Co-ordinates (m) : 684,240.E, 5,610,556.N
Ground Elevation (m) : 958
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste Track Rig
Drilling Contractor : Geotech Drilling
Drill Method : ODEX / Diamond Drill
Core : HQ3
Fluid : water
Casing : HW **Cased To (m)** : 3.05

Start Date : 03 Mar 11
Finish Date : 03 Mar 11
Final Depth of Hole (m): : 12.6
Depth to Top of Rock (m) : 1.80
Logged by : LGT
Reviewed by : HWN

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details	DCT Blows per 300mm	SPT Blows per 150mm
0		M1		SAND (SM) Silty, grass mat, rootlets, moist, frozen. [TOPSOIL]			6 8 9
1		M2		SAND (SM) Silty, trace clay, compact, brown, light smell of organics, moist, homogenous, weak cementation, moderate to rapid dilatancy. [TILL]			20 31 39
2				SAND (SW) Gravelly, trace silt, well graded, dense, maximum particle size = 40 mm, elongated, angular to sub-angular, light brownish grey, dry, homogenous, non-cemented. [TILL]			
3				GRAVEL (GP) Some sand, trace silt, gap graded, very dense, maximum particle size = 35 mm, equant to elongated, angular. [TILL]			
4				Rock encountered at 1.80 m depth. See DH-BGC11-WC-18 rock log.			
5							
6							
7							
8							

Su - kPa: 40, 80, 120, 160
VANE FIELD LAB: PEAK, REMOLD
UC/2
Pocket Pen /2
DCT (blows/300mm)
SPT (blows/300mm)
★ % Fines
Hydraulic Conductivity (m/sec): 10^{-8} 10^{-6} 10^{-4} 10^{-2}
Core Recovery: 20 40 60 80
Moisture Content & SPT N: W_P% W% W_L%: 20 40 60 80

DRILL HOLE # DH-BGC11-WC-18

CO-ORDINATES : 684,240.E, 5,610,556.N
GROUND ELEVATION (m) : 958
SURVEY METHOD :Handheld GPS
DATUM : NAD83
PLUNGE (°) : 90
TREND (°) : n/a

DRILL DESIGNATION : Fraste Track Rig
DRILLING CONTRACTOR : Geotech Drilling
DRILL METHOD : ODEX / Diamond Drill
CORE SIZE : HQ3
FLUID : water
CASED TO (m): 3.05

START DATE : 03 Mar 11
FINISH DATE : 03 Mar 11
FINAL DEPTH (m) : 12.6
DEPTH TO TOP OF ROCK (m) : 1.8
LOGGED BY : LGT
REVIEWED BY : HWN

DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % / RQD % (20 40 60 80) | WEATHERING GRADE (2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / STRENGTH GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (10 20 30 40) | Joint Condition (Jc) (5 10 15 20) | RMR (20 40 60 80) | DEPTH (m)

0 to 1.80 m - See DH-BGC11-WC-18 soil log.

BEDROCK
Greenish grey, fine to medium grained, massive, microfractured, porphyritic, weak to medium strong (R2 - R3), slightly weathered (W2), no discernible discontinuity sets, discontinunities are medium strong, trace weak discontinuities, closely to very closely spaced, some iron oxide staining, smooth to rough, planar to undulated, small apertures.
[IRON MASK HYBRID]

(CONTINUED ON NEXT PAGE)

CLIENT: Abacus Mining and Exploration Corporation
PRINT DATE: : 7/26/2011

PROJECT: Ajax Project Feasibility Study

PROJECT NO. : 0712-003

DRILL HOLE # DH-BGC11-WC-18

CO-ORDINATES : 684,240.E, 5,610,556.N
GROUND ELEVATION (m) : 958
SURVEY METHOD :Handheld GPS
DATUM : NAD83
PLUNGE (°) : 90
TREND (°) : n/a

DRILL DESIGNATION : Fraste Track Rig
DRILLING CONTRACTOR : Geotech Drilling
DRILL METHOD : ODEX / Diamond Drill
CORE SIZE : HQ3
FLUID : water
CASED TO (m): 3.05

START DATE : 03 Mar 11
FINISH DATE : 03 Mar 11
FINAL DEPTH (m) : 12.6
DEPTH TO TOP OF ROCK (m) : 1.8
LOGGED BY : LGT
REVIEWED BY : HWN

DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION
8			
9			
10			
11			11.05 m - intrusive coarse grained pyroxenite present
12			12.48 to 12.58 m - broken/disintegrated zone at end of hole, < 2 cm blocks
13			END OF HOLE AT 12.58 m Notes: 1. 2.5" PVC standpipe piezometer installed 2. All SPT's completed using an auto trip hammer weighing 140 lbs dropped from 30 inches. 3. Drill hole backfilled with bentonite chips above the piezometer sandpack. 4. Elevation was extracted from DEM
14			
15			
16			

CORE RECOVERY %
RQD % — 20 40 60 80

WEATHERING GRADE — 2 3 4 5

POINT LOAD INDEX
Is_{50} ◆
0.1 0.6 1.5 3.0 7.0 (MPa)
STRENGTH GRADE (R)
R1 R2 R3 R4 R5

FRACTURE FREQUENCY (FF/M) — 10 20 30 40

Joint Condition (Jc) — 5 10 15 20

RMR — 20 40 60 80

DEPTH (m)

CLIENT: Abacus Mining and Exploration Corporation

PRINT DATE: : 7/26/2011

Survey Method : Handheld GPS
Co-ordinates (m) : 683,158.E, 5,610,849.N
Ground Elevation (m) : 917
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste Track Rig
Drilling Contractor : Geotech Drilling
Drill Method : ODEX / Diamond Drill
Core : HQ3
Fluid : water
Casing : HW **Cased To (m)** : 1.50

Start Date : 04 Mar 11
Finish Date : 04 Mar 11
Final Depth of Hole (m): : 11.5
Depth to Top of Rock (m) : 1.50
Logged by : LGT
Reviewed by : HWN

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details	DCT Blows per 300mm	SPT Blows per 150mm
0				Rootmat, organic silt, brown, organic odour, frozen. [TOPSOIL]			8 5 8
		M1		SILT (ML) Trace fine sand, trace clay, trace rootlets, low plasticity, stiff, brown, light organic smell, dry to moist, homogeneous, weakly cemented, moderate dilalancy. [TILL]			
1		M2		SAND (SM) AND GRAVEL Silty, trace clay, dense, maximum particle size = 40 mm, elongated, angular, light brown (clasts - grey), dry, homogeneous, weak cementation. [TILL]			15 R
2				Rock encountered at 1.50 m depth. See DH-BGC11-PS-19 rock log.			
3							
4							
5							
6							
7							
8							

Su - kPa
40 80 120 160
VANE FIELD LAB
PEAK ◆ ■
REMOLD ◇ □
▲ UC/2
△ Pocket Pen /2
★ % Fines
Hydraulic Conductivity (m/sec)
10^{-8} 10^{-6} 10^{-4} 10^{-2}
DCT (blows/300mm)
● SPT (blows/300mm)
Core Recovery
20 40 60 80
Moisture Content & SPT N
W_P% W% W_L%
20 40 60 80

DRILL HOLE # DH-BGC11-PS-19

CO-ORDINATES : 683,158.E, 5,610,849.N
GROUND ELEVATION (m) : 917
SURVEY METHOD :Handheld GPS
DATUM : NAD83
PLUNGE (°) : 90
TREND (°) : n/a

DRILL DESIGNATION : Fraste Track Rig
DRILLING CONTRACTOR : Geotech Drilling
DRILL METHOD : ODEX / Diamond Drill
CORE SIZE : HQ3
FLUID : water
CASED TO (m): 1.5

START DATE : 04 Mar 11
FINISH DATE : 04 Mar 11
FINAL DEPTH (m) : 11.5
DEPTH TO TOP OF ROCK (m) : 1.5
LOGGED BY : LGT
REVIEWED BY : HWN

DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION
0			
1			0 to 1.50 m - See DH-BGC11-PS-19 soil log.
2			BEDROCK Intrusive, greenish grey, fine to coarse grained, massive, porphyritic, strong (R4), slightly weathered (W2), one discernible joint set (40-50°, from core axis), discontinuities are medium strong to strong, close spacing, little infill, smooth to rough, undulating to planar, small apertures. [IRON MASK HYBRID]
3			
4			
5			5.4 m - Core becomes fresh (W1) past this depth.
6			
7			
8			

CORE RECOVERY %
RQD %
20 40 60 80

WEATHERING GRADE
2 3 4 5

POINT LOAD INDEX
Is_{50} ◆
0.1 0.6 1.5 3.0 7.0
(MPa)
STRENGTH GRADE (R)
R1 R2 R3 R4 R5

FRACTURE FREQUENCY (FF/M)
10 20 30 40

Joint Condition (Jc)
5 10 15 20

RMR
20 40 60 80

(CONTINUED ON NEXT PAGE)

CLIENT: Abacus Mining and Exploration Corporation
PRINT DATE: : 7/26/2011

PROJECT: Ajax Project Feasibility Study

PROJECT NO. : 0712-003

DRILL HOLE # DH-BGC11-PS-19

CO-ORDINATES : 683,158.E, 5,610,849.N
GROUND ELEVATION (m) : 917
SURVEY METHOD :Handheld GPS
DATUM : NAD83
PLUNGE (°) : 90
TREND (°) : n/a

DRILL DESIGNATION : Fraste Track Rig
DRILLING CONTRACTOR : Geotech Drilling
DRILL METHOD : ODEX / Diamond Drill
CORE SIZE : HQ3
FLUID : water
CASED TO (m): 1.5

START DATE : 04 Mar 11
FINISH DATE : 04 Mar 11
FINAL DEPTH (m) : 11.5
DEPTH TO TOP OF ROCK (m) : 1.5
LOGGED BY : LGT
REVIEWED BY : HWN

DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION
8			8.1 m - rock looks more brecciated (silica rich volcanic conglomerate)
9			
10			
11			
			END OF HOLE AT 11.50 m
12			Notes: 1. 2.5" standpipe piezometer installed 2. All SPT's completed using an auto trip hammer weighing 140 lbs dropped 30 inches 3. Drill hole backfilled with bentonite chips above the piezometer sandpack. 4. Elevation was extracted from DEM
13			
14			
15			
16			

CORE RECOVERY %
RQD % — 20 40 60 80

WEATHERING GRADE — 2 3 4 5

POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa)
STRENGTH GRADE (R) — R1 R2 R3 R4 R5

FRACTURE FREQUENCY (FF/M) — 10 20 30 40

Joint Condition (Jc) — 5 10 15 20

RMR — 20 40 60 80

DEPTH (m)

CLIENT: Abacus Mining and Exploration Corporation

PRINT DATE: : 7/26/2011

Survey Method : Handheld GPS
Co-ordinates (m) : 683,109.E, 5,610,729.N
Ground Elevation (m) : 914
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Zinex A5
Drilling Contractor : Matrix
Drill Method : Diamond
Core : HQ
Fluid : water & polymer
Casing : HW **Cased To (m)** : 1.52

Start Date : 18 Apr 11
Finish Date : 18 Apr 11
Final Depth of Hole (m): : 9.9
Depth to Top of Rock (m) : 1.25
Logged by : AR
Reviewed by : HWN

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details	DCT Blows per 300mm	SPT Blows per 150mm
0				OVERBURDEN SOIL (no recovery) Refer to TP-BGC11-87 for soil description			
1				1.20 to 1.37 m - Highly weathered, disintegrated rock Rock encountered at 1.25 m depth. See DH-BGC11-PS-20 rock log.			
2							
3							
4							
5							
6							
7							
8							

Su - kPa
40 80 120 160
VANE FIELD LAB
PEAK ◆ ■
REMOLD ◇ □
▲ UC/2
△ Pocket Pen /2
★ % Fines
Hydraulic Conductivity (m/sec)
10^{-8} 10^{-6} 10^{-4} 10^{-2}
DCT (blows/300mm)
● SPT (blows/300mm)
Core Recovery
20 40 60 80
Moisture Content & SPT N
W_P% W% W_L%
20 40 60 80

DRILL HOLE # DH-BGC11-PS-20

CO-ORDINATES : 683,109.E, 5,610,729.N
GROUND ELEVATION (m) : 914
SURVEY METHOD :Handheld GPS
DATUM : NAD83
PLUNGE (°) : 90
TREND (°) : n/a

DRILL DESIGNATION : Zinex A5
DRILLING CONTRACTOR : Matrix
DRILL METHOD : Diamond
CORE SIZE : HQ
FLUID : water & polymer
CASED TO (m): 1.52

START DATE : 18 Apr 11
FINISH DATE : 18 Apr 11
FINAL DEPTH (m) : 9.9
DEPTH TO TOP OF ROCK (m) : 1.3
LOGGED BY : AR
REVIEWED BY : HWN

DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % / RQD % (20 40 60 80) | WEATHERING GRADE (2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / STRENGTH GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (10 20 30 40) | Joint Condition (Jc) (5 10 15 20) | RMR (20 40 60 80) | DEPTH (m)

0 to 1.25 m - See DH-BGC11-PS-20 soil log.

BEDROCK
Intrusive greenish grey, medium grained, massive, microfractured, medium strong (R3), slightly to moderately weathered (W2-W3), one discernible discontinuity set (65-75° from core axis), joint surfaces are medium strong, closely spaced, trace silt infill, trace crushed rock infill, small aperture, rough and planar, magnetic.
[IRON MASK HYBRID]

1.94 to 2.15 m - Broken rock, 3 -5 cm blocks

5.30 m - Fault, 100 mm aperture, fault gouge, alpha angle = 35 degrees

5.75 m - weathering grade changes to slightly weathered.

6.68 m - Fault, 220 mm aperture, fault gouge, alpha angle = 40 degrees

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CLIENT: Abacus Mining and Exploration Corporation
PRINT DATE: : 7/26/2011

PROJECT: Ajax Project Feasibility Study

PROJECT NO. : 0712-003

DRILL HOLE # DH-BGC11-PS-20

CO-ORDINATES : 683,109.E, 5,610,729.N
GROUND ELEVATION (m) : 914
SURVEY METHOD :Handheld GPS
DATUM : NAD83
PLUNGE (°) : 90
TREND (°) : n/a

DRILL DESIGNATION : Zinex A5
DRILLING CONTRACTOR : Matrix
DRILL METHOD : Diamond
CORE SIZE : HQ
FLUID : water & polymer
CASED TO (m): 1.52

START DATE : 18 Apr 11
FINISH DATE : 18 Apr 11
FINAL DEPTH (m) : 9.9
DEPTH TO TOP OF ROCK (m) : 1.3
LOGGED BY : AR
REVIEWED BY : HWN

DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % / RQD % (20 40 60 80)	WEATHERING GRADE (2 3 4 5)	POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / STRENGTH GRADE (R) R1 R2 R3 R4 R5	FRACTURE FREQUENCY (FF/M) (10 20 30 40)	Joint Condition (Jc) (5 10 15 20)	RMR (20 40 60 80)	DEPTH (m)
8										8
9			8.42 m - Fault, 120 mm aperture, broken rock, alpha angle = 45 degrees							9
10			END OF HOLE AT 9.85 m Notes: 1. 2.5" PVC standpipe piezometer installed. 2. Drill hole backfilled with bentonite chips above the piezometer sandpack. 3. Elevation was extracted from DEM							10
11										11
12										12
13										13
14										14
15										15
16										16

CLIENT: Abacus Mining and Exploration Corporation

PRINT DATE: : 7/26/2011

Survey Method : Handheld GPS
Co-ordinates (m) : 683,279.E, 5,610,769.N
Ground Elevation (m) : 925
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Zinex A5
Drilling Contractor : Matrix
Drill Method : Diamond
Core : HQ
Fluid : water & polymer
Casing : HW **Cased To (m)** : 3.05

Start Date : 19 Apr 11
Finish Date : 19 Apr 11
Final Depth of Hole (m): : 14.3
Depth to Top of Rock (m) : 3.05
Logged by : AR
Reviewed by : HWN

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details	DCT Blows per 300mm	SPT Blows per 150mm
0				OVERBURDEN SOIL (no recovery) Note: trace boulders 300-600 mm in diameter encountered. Refer to TP-BGC11-88 for soil description.			
3				Rock encountered at 3.05 m depth. See DH-BGC11-PS-21 rock log.			

Su - kPa: 40, 80, 120, 160
VANE PEAK ◆ FIELD ■ LAB
REMOLD ◇ □
▲ UC/2
△ Pocket Pen /2
★ % Fines
Hydraulic Conductivity (m/sec) 10^{-8} 10^{-6} 10^{-4} 10^{-2}
DCT (blows/300mm)
● SPT (blows/300mm)
Core Recovery 20 40 60 80
Moisture Content & SPT N
W_P% W% W_L% 20 40 60 80

DRILL HOLE # DH-BGC11-PS-21

CO-ORDINATES : 683,279.E, 5,610,769.N
GROUND ELEVATION (m) : 925
SURVEY METHOD :Handheld GPS
DATUM : NAD83
PLUNGE (°) : 90
TREND (°) : n/a

DRILL DESIGNATION : Zinex A5
DRILLING CONTRACTOR : Matrix
DRILL METHOD : Diamond
CORE SIZE : HQ
FLUID : water & polymer
CASED TO (m): 3.05

START DATE : 19 Apr 11
FINISH DATE : 19 Apr 11
FINAL DEPTH (m) : 14.3
DEPTH TO TOP OF ROCK (m) : 3.1
LOGGED BY : AR
REVIEWED BY : HWN

DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % / RQD % (20 40 60 80) | WEATHERING GRADE (2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / STRENGTH GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (10 20 30 40) | Joint Condition (Jc) (5 10 15 20) | RMR (20 40 60 80) | DEPTH (m)

0 to 3.05 m - See DH-BGC11-PS-21 soil log.

BEDROCK
Intrusive, greenish grey, medium grained, massive, equigranular to porphyritic, medium strong (R3), slightly weathered (W2), no to one discernible discontinuity set (35-55°, from core axis), discontinuity surfaces are medium strong, close to moderately close spacing, trace silt infill, rough surfaces, planar, some joints along quartz veins, some magnetic minerals.
[IRON MASK HYBRID]

4.40 to 4.70 m - Fault, 300 mm aperture, fault gouge, alpha angles = 31° and 55°

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CLIENT: Abacus Mining and Exploration Corporation
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PROJECT: Ajax Project Feasibility Study

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DRILL HOLE # DH-BGC11-PS-21

CO-ORDINATES : 683,279.E, 5,610,769.N
GROUND ELEVATION (m) : 925
SURVEY METHOD :Handheld GPS
DATUM : NAD83
PLUNGE (°) : 90
TREND (°) : n/a

DRILL DESIGNATION : Zinex A5
DRILLING CONTRACTOR : Matrix
DRILL METHOD : Diamond
CORE SIZE : HQ
FLUID : water & polymer
CASED TO (m): 3.05

START DATE : 19 Apr 11
FINISH DATE : 19 Apr 11
FINAL DEPTH (m) : 14.3
DEPTH TO TOP OF ROCK (m) : 3.1
LOGGED BY : AR
REVIEWED BY : HWN

DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION
8			7.90 to 9.79 m - a pair of long joints sub parallel to core axis
9			
10			
11			10.60 m - Colour changes from greenish grey to dark greyish green, also contains magnetic minerals, still R3 strength.
12			
13			
14			
15			END OF HOLE AT 14.33 m Notes: 1. 2.5" PVC standpipe piezometer installed. 2. Drill hole backfilled with bentonite chips above the piezometer sandpack. 3. Elevation was extracted from DEM
16			

CORE RECOVERY % / RQD % — 20 40 60 80

WEATHERING GRADE — 2 3 4 5

POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa)
STRENGTH GRADE (R) R1 R2 R3 R4 R5

FRACTURE FREQUENCY (FF/M) — 10 20 30 40

Joint Condition (Jc) — 5 10 15 20

RMR — 20 40 60 80

DEPTH (m)

CLIENT: Abacus Mining and Exploration Corporation

PRINT DATE: : 7/26/2011

Survey Method : Handheld GPS
Co-ordinates (m) : 683,394.E, 5,610,792.N
Ground Elevation (m) : 932
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Zinex A5
Drilling Contractor : Matrix
Drill Method : Diamond
Core : HQ
Fluid : water & polymer
Casing : HW **Cased To (m)** : 7.30

Start Date : 20 Apr 11
Finish Date : 20 Apr 11
Final Depth of Hole (m): : 17.4
Depth to Top of Rock (m) : 7.00
Logged by : AR
Reviewed by : HWN

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details	DCT Blows per 300mm	SPT Blows per 150mm
0				OVERBURDEN SOIL (no recovery) Refer to TP-BGC11-89 for soil description.			
7				Rock encountered at 7.00 m depth. See DH-BGC11-PS-22 rock log.			
8							

Su - kPa: 40, 80, 120, 160
VANE FIELD LAB: PEAK ◆ ■; REMOLD ◇ □
★ % Fines
Hydraulic Conductivity (m/sec): 10^{-8} 10^{-6} 10^{-4} 10^{-2}
Core Recovery: 20 40 60 80
▲ UC/2
△ Pocket Pen /2
DCT (blows/300mm)
● SPT (blows/300mm)
Moisture Content & SPT N: W_P% W% W_L%: 20 40 60 80

PROJECT: Ajax Project Feasibility Study

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DRILL HOLE # DH-BGC11-PS-22

CO-ORDINATES : 683,394.E, 5,610,792.N
GROUND ELEVATION (m) : 932
SURVEY METHOD :Handheld GPS
DATUM : NAD83
PLUNGE (°) : 90
TREND (°) : -

DRILL DESIGNATION : Zinex A5
DRILLING CONTRACTOR : Matrix
DRILL METHOD : Diamond
CORE SIZE : HQ
FLUID : water & polymer
CASED TO (m): 7.30

START DATE : 20 Apr 11
FINISH DATE : 20 Apr 11
FINAL DEPTH (m) : 17.4
DEPTH TO TOP OF ROCK (m) : 7.0
LOGGED BY : AR
REVIEWED BY : HWN

DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % / RQD % (20 40 60 80)	WEATHERING GRADE (2 3 4 5)	POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / STRENGTH GRADE (R) R1 R2 R3 R4 R5	FRACTURE FREQUENCY (FF/M) (10 20 30 40)	Joint Condition (Jc) (5 10 15 20)	RMR (20 40 60 80)	DEPTH (m)
0										0
1										1
2										2
3			0 to 7.00 m - See DH-BGC11-PS-22 soil log.							3
4										4
5										5
6										6
7										7
8			BEDROCK Intrusive, greenish grey, medium to coarse grained, massive, medium strong (R3), slightly weathered (W2), one joint set (35-40° from core axis), joint surfaces are medium strong, closely spaced, quartz infilled, rough, planar to undulating [IRON MASK HYBRID]							8

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CLIENT: Abacus Mining and Exploration Corporation

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PROJECT: Ajax Project Feasibility Study

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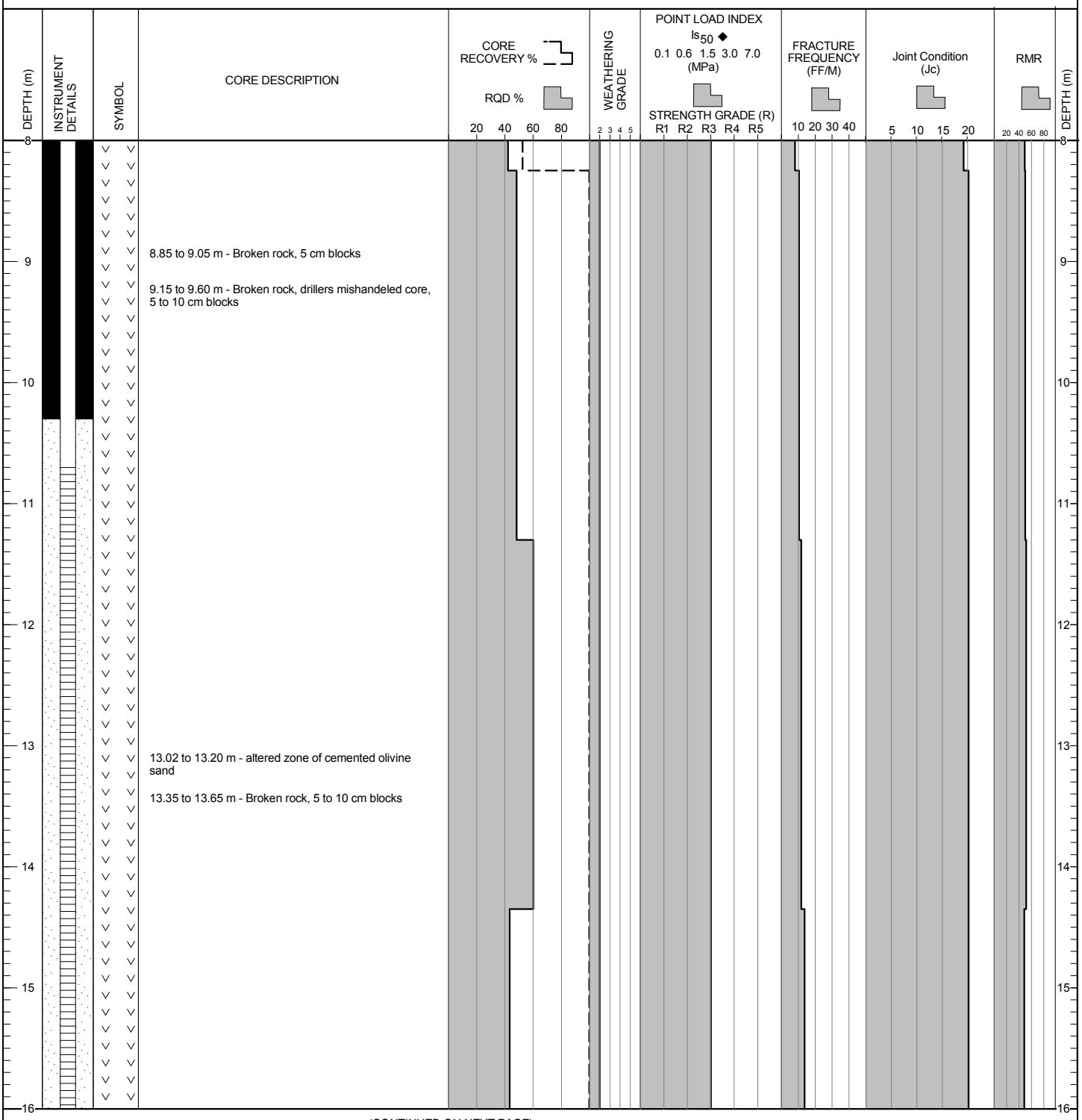
DRILL HOLE # DH-BGC11-PS-22

CO-ORDINATES : 683,394.E, 5,610,792.N
GROUND ELEVATION (m) : 932
SURVEY METHOD :Handheld GPS
DATUM : NAD83
PLUNGE (°) : 90
TREND (°) : -

DRILL DESIGNATION : Zinex A5
DRILLING CONTRACTOR : Matrix
DRILL METHOD : Diamond
CORE SIZE : HQ
FLUID : water & polymer
CASED TO (m): 7.30

START DATE : 20 Apr 11
FINISH DATE : 20 Apr 11
FINAL DEPTH (m) : 17.4
DEPTH TO TOP OF ROCK (m) : 7.0
LOGGED BY : AR
REVIEWED BY : HWN



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DRILL HOLE # DH-BGC11-PS-22

CO-ORDINATES : 683,394.E, 5,610,792.N
GROUND ELEVATION (m) : 932
SURVEY METHOD :Handheld GPS
DATUM : NAD83
PLUNGE (°) : 90
TREND (°) : -

DRILL DESIGNATION : Zinex A5
DRILLING CONTRACTOR : Matrix
DRILL METHOD : Diamond
CORE SIZE : HQ
FLUID : water & polymer
CASED TO (m): 7.30

START DATE : 20 Apr 11
FINISH DATE : 20 Apr 11
FINAL DEPTH (m) : 17.4
DEPTH TO TOP OF ROCK (m) : 7.0
LOGGED BY : AR
REVIEWED BY : HWN

DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION
16			
17			16.87 to 17.04 m - Fault zone, fault gouge infilling
			END OF HOLE AT 17.40 m Notes: 1. 2.5" PVC standpipe piezometer installed 2. Drill hole backfilled with bentonite chips above the piezometer sandpack. 3. Elevation was extracted from DEM
18			
19			
20			
21			
22			
23			
24			

CORE RECOVERY %
RQD % — 20 40 60 80

WEATHERING GRADE — 2 3 4 5

POINT LOAD INDEX
Is_{50} ◆
0.1 0.6 1.5 3.0 7.0
(MPa)
STRENGTH GRADE (R)
R1 R2 R3 R4 R5

FRACTURE FREQUENCY (FF/M) — 10 20 30 40

Joint Condition (Jc) — 5 10 15 20

RMR — 20 40 60 80

DEPTH (m)

CLIENT: Abacus Mining and Exploration Corporation

PRINT DATE: : 7/26/2011

Survey Method : Handheld GPS
Co-ordinates (m) : 683,245.E, 5,610,859.N
Ground Elevation (m) : 925
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Zinex A5
Drilling Contractor : Matrix
Drill Method : Diamond
Core : HQ
Fluid : water & polymer
Casing : HW **Cased To (m)** : 5.50

Start Date : 21 Apr 11
Finish Date : 21 Apr 11
Final Depth of Hole (m): : 15.9
Depth to Top of Rock (m) : 6.15
Logged by : AR
Reviewed by : HWN

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description
0				OVERBURDEN SOIL (no recovery) Refer to TP-BGC11-90 for soil description.
5				GRAVEL and SAND (GM/SM) Silty, well graded, very dense, maximum particle size 40 mm, subrounded, brown, no odour, moist, homogenous, moderate cementation. [TILL]
6				Rock encountered at 6.15 m depth. See DH-BGC11-PS-23 rock log.

Instrument Details | DCT Blows per 300mm | SPT Blows per 150mm

Su - kPa: 40, 80, 120, 160
VANE FIELD LAB: PEAK ◆ ■; REMOLD ◇ □
▲ UC/2; △ Pocket Pen /2
★ % Fines
Hydraulic Conductivity (m/sec): 10^{-8} 10^{-6} 10^{-4} 10^{-2}
DCT (blows/300mm); ● SPT (blows/300mm)
Core Recovery: 20 40 60 80
Moisture Content & SPT N: W_P% W% W_L%: 20 40 60 80

PROJECT: Ajax Project Feasibility Study

PROJECT NO. : 0712-003

DRILL HOLE # DH-BGC11-PS-23

CO-ORDINATES : 683,245.E, 5,610,859.N
GROUND ELEVATION (m) : 925
SURVEY METHOD :Handheld GPS
DATUM : NAD83
PLUNGE (°) : 90
TREND (°) : n/a

DRILL DESIGNATION : Zinex A5
DRILLING CONTRACTOR : Matrix
DRILL METHOD : Diamond
CORE SIZE : HQ
FLUID : water & polymer
CASED TO (m): 5.5

START DATE : 21 Apr 11
FINISH DATE : 21 Apr 11
FINAL DEPTH (m) : 15.9
DEPTH TO TOP OF ROCK (m) : 6.2
LOGGED BY : AR
REVIEWED BY : HWN

DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION
0 – 6			0 to 6.15 m - See DH-BGC11-PS-23 soil log.
6 – 8			BEDROCK Intrusive greenish grey, medium to coarse grained, massive, medium strong (R3), slightly to moderately weathered (W2 - W3), two discontinuity sets (35-45°, 70-80° discontinuity surfaces are medium strong, closely spaced, rough, planar to undulating, several joints along quartz veins, magnetic minerals. [IRON MASK HYBRID] 7.15 to 7.78 m - Fault zone with fault gouge, oriented 45° to core axis, highly weathered.

CORE RECOVERY % / RQD % : 20 40 60 80

WEATHERING GRADE : 2 3 4 5

POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa)
STRENGTH GRADE (R) : R1 R2 R3 R4 R5

FRACTURE FREQUENCY (FF/M) : 10 20 30 40

Joint Condition (Jc) : 5 10 15 20

RMR : 20 40 60 80

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CLIENT: Abacus Mining and Exploration Corporation

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PROJECT: Ajax Project Feasibility Study

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DRILL HOLE # DH-BGC11-PS-23

CO-ORDINATES : 683,245.E, 5,610,859.N
GROUND ELEVATION (m) : 925
SURVEY METHOD :Handheld GPS
DATUM : NAD83
PLUNGE (°) : 90
TREND (°) : n/a

DRILL DESIGNATION : Zinex A5
DRILLING CONTRACTOR : Matrix
DRILL METHOD : Diamond
CORE SIZE : HQ
FLUID : water & polymer
CASED TO (m): 5.5

START DATE : 21 Apr 11
FINISH DATE : 21 Apr 11
FINAL DEPTH (m) : 15.9
DEPTH TO TOP OF ROCK (m) : 6.2
LOGGED BY : AR
REVIEWED BY : HWN

DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % / RQD % (20 40 60 80) | WEATHERING GRADE (2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / STRENGTH GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (10 20 30 40) | Joint Condition (Jc) (5 10 15 20) | RMR (20 40 60 80) | DEPTH (m)

8 m
7.91 to 8.30 m - Highly fractured with some quartz infill.
8.66 to 8.75 m - Highly fractured.
9 m
9.26 to 9.75 m - Highly fractured, possible fault, 1 - 3 cm blocks
10 m
10.55 to 11.30 m - Highly weathered, quartz veins.
11 m
11.30 to 11.80 m - Highly fractured, possible fault, fines washed out.
12 m
12.48 to 13.20 m - Low recovery, possible fault, blocks 50 to 100 mm.
13 m
13.70 to 14.52 m - Broken rock, blocks 50 to 100 mm.
14 m
15 m
16 m
END OF HOLE AT 15.85 m

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CLIENT: Abacus Mining and Exploration Corporation

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PROJECT: Ajax Project Feasibility Study

PROJECT NO. : 0712-003

DRILL HOLE # DH-BGC11-PS-23

CO-ORDINATES : 683,245.E, 5,610,859.N
GROUND ELEVATION (m) : 925
SURVEY METHOD :Handheld GPS
DATUM : NAD83
PLUNGE (°) : 90
TREND (°) : n/a

DRILL DESIGNATION : Zinex A5
DRILLING CONTRACTOR : Matrix
DRILL METHOD : Diamond
CORE SIZE : HQ
FLUID : water & polymer
CASED TO (m): 5.5

START DATE : 21 Apr 11
FINISH DATE : 21 Apr 11
FINAL DEPTH (m) : 15.9
DEPTH TO TOP OF ROCK (m) : 6.2
LOGGED BY : AR
REVIEWED BY : HWN

DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % / RQD % (20 40 60 80)	WEATHERING GRADE (2 3 4 5)	POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / STRENGTH GRADE (R) R1 R2 R3 R4 R5	FRACTURE FREQUENCY (FF/M) (10 20 30 40)	Joint Condition (Jc) (5 10 15 20)	RMR (20 40 60 80)	DEPTH (m)
16			Notes: 1. 2.5" PVC standpipe piezometer installed 2. Drill hole backfilled with bentonite chips above the piezometer sandpack. 3. Elevation was extracted from DEM							16
17										17
18										18
19										19
20										20
21										21
22										22
23										23
24										24

CLIENT: Abacus Mining and Exploration Corporation

PRINT DATE: : 7/26/2011

Survey Method : Handheld GPS
Co-ordinates (m) : 682,957.E, 5,610,788.N
Ground Elevation (m) : 920
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Zinex A5
Drilling Contractor : Matrix
Drill Method : Diamond
Core : HQ
Fluid : water & polymer
Casing : HW **Cased To (m)** : 0.60

Start Date : 21 Apr 11
Finish Date : 21 Apr 11
Final Depth of Hole (m): : 11.3
Depth to Top of Rock (m) : 0.60
Logged by : AR
Reviewed by : HWN

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details	DCT Blows per 300mm	SPT Blows per 150mm
0				OVERBURDEN SOIL (no recovery) Refer to TP-BGC11-91 for soil description.			
				Rock encountered at 0.60 m depth. See DH-BGC11-PS-24 rock log.			
1							
2							
3							
4							
5							
6							
7							
8							

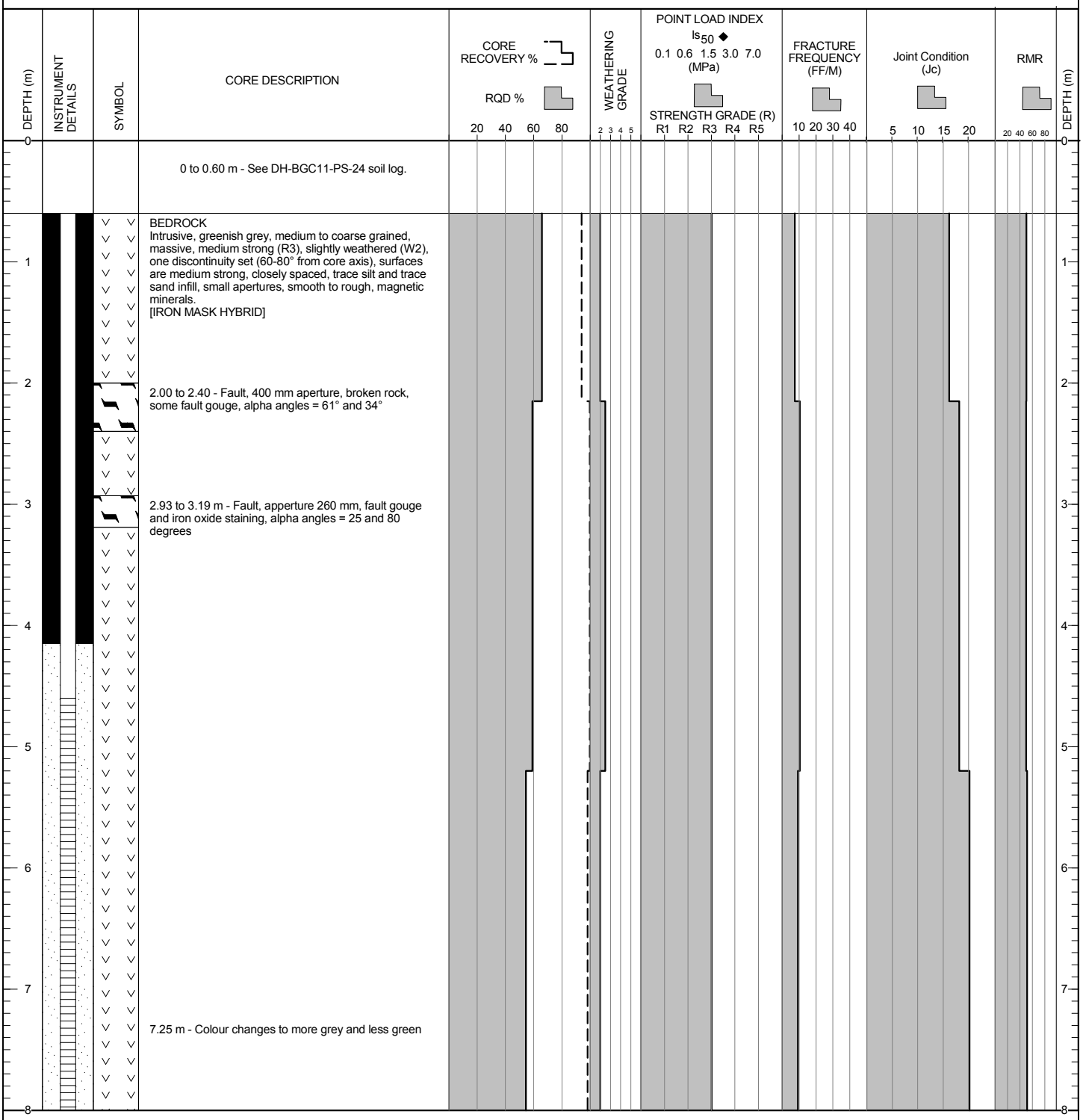
Su - kPa
40 80 120 160
VANE FIELD LAB
PEAK ◆ ■
REMOLD ◇ □
▲ UC/2
△ Pocket Pen /2
★ % Fines
Hydraulic Conductivity (m/sec)
10^{-8} 10^{-6} 10^{-4} 10^{-2}
DCT (blows/300mm)
● SPT (blows/300mm)
Core Recovery
20 40 60 80
Moisture Content & SPT N
W_P% W% W_L%
20 40 60 80

DRILL HOLE # DH-BGC11-PS-24

CO-ORDINATES : 682,957.E, 5,610,788.N
GROUND ELEVATION (m) : 920
SURVEY METHOD :Handheld GPS
DATUM : NAD83
PLUNGE (°) : 90
TREND (°) : n/a

DRILL DESIGNATION : Zinex A5
DRILLING CONTRACTOR : Matrix
DRILL METHOD : Diamond
CORE SIZE : HQ
FLUID : water & polymer
CASED TO (m): 0.60

START DATE : 21 Apr 11
FINISH DATE : 21 Apr 11
FINAL DEPTH (m) : 11.3
DEPTH TO TOP OF ROCK (m) : 0.6
LOGGED BY : AR
REVIEWED BY : HWN



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CLIENT: Abacus Mining and Exploration Corporation
PRINT DATE: : 7/26/2011

PROJECT: Ajax Project Feasibility Study

PROJECT NO. : 0712-003

DRILL HOLE # DH-BGC11-PS-24

CO-ORDINATES : 682,957.E, 5,610,788.N
GROUND ELEVATION (m) : 920
SURVEY METHOD :Handheld GPS
DATUM : NAD83
PLUNGE (°) : 90
TREND (°) : n/a

DRILL DESIGNATION : Zinex A5
DRILLING CONTRACTOR : Matrix
DRILL METHOD : Diamond
CORE SIZE : HQ
FLUID : water & polymer
CASED TO (m): 0.60

START DATE : 21 Apr 11
FINISH DATE : 21 Apr 11
FINAL DEPTH (m) : 11.3
DEPTH TO TOP OF ROCK (m) : 0.6
LOGGED BY : AR
REVIEWED BY : HWN

DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % / RQD % (20 40 60 80) | WEATHERING GRADE (2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / STRENGTH GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (10 20 30 40) | Joint Condition (Jc) (5 10 15 20) | RMR (20 40 60 80) | DEPTH (m)

END OF HOLE AT 11.30 m

Notes:
1. 2.5" standpipe piezometer installed.
2. Drill hole backfilled with bentonite chips above the piezometer sandpack.
3. Elevation was extracted from DEM

CLIENT: Abacus Mining and Exploration Corporation

PRINT DATE: : 7/26/2011

Survey Method : Handheld GPS
Co-ordinates (m) : 683,091.E, 5,610,906.N
Ground Elevation (m) : 920
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Zinex A5
Drilling Contractor : Matrix
Drill Method : Diamond
Core : HQ
Fluid : water & polymer
Casing : HW **Cased To (m)** : 1.20

Start Date : 22 Apr 11
Finish Date : 22 Apr 11
Final Depth of Hole (m): : 11.3
Depth to Top of Rock (m) : 1.05
Logged by : AR
Reviewed by : HWN

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details	DCT Blows per 300mm	SPT Blows per 150mm
0				OVERBURDEN SOIL (no recovery) Refer to TP-BGC11-92 for soil description.			
1				Rock encountered at 1.05 m depth. See DH-BGC11-PS-25 rock log.			
2							
3							
4							
5							
6							
7							
8							

Su - kPa
40 80 120 160
VANE FIELD LAB
PEAK ◆ ■
REMOLD ◇ □
▲ UC/2
△ Pocket Pen /2
★ % Fines
Hydraulic Conductivity (m/sec)
10^{-8} 10^{-6} 10^{-4} 10^{-2}
DCT (blows/300mm)
● SPT (blows/300mm)
Core Recovery
20 40 60 80
Moisture Content & SPT N
W_P% W% W_L%
20 40 60 80

PROJECT: Ajax Project Feasibility Study

PROJECT NO. : 0712-003

DRILL HOLE # DH-BGC11-PS-25

CO-ORDINATES : 683,091.E, 5,610,906.N
GROUND ELEVATION (m) : 920
SURVEY METHOD :Handheld GPS
DATUM : NAD83
PLUNGE (°) : 90
TREND (°) : n/a

DRILL DESIGNATION : Zinex A5
DRILLING CONTRACTOR : Matrix
DRILL METHOD : Diamond
CORE SIZE : HQ
FLUID : water & polymer
CASED TO (m): 1.20

START DATE : 22 Apr 11
FINISH DATE : 22 Apr 11
FINAL DEPTH (m) : 11.3
DEPTH TO TOP OF ROCK (m) : 1.1
LOGGED BY : AR
REVIEWED BY : HWN

DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % / RQD % (20 40 60 80) | WEATHERING GRADE (2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / STRENGTH GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (10 20 30 40) | Joint Condition (Jc) (5 10 15 20) | RMR (20 40 60 80) | DEPTH (m)

0 to 1.05 m - See DH-BGC11-PS-25 soil log.

BEDROCK
Intrusive, greenish grey, medium to coarse grained, massive, medium strong (R3), slightly weathered (W2), two discontinuity sets (30-40, 50-55° from core axis), discontinuity surfaces are medium strong, closely spaced, trace silt, sand, and quartz infill, small appertures, smooth to rough, magnetic minerals. [IRON MASK HYBRID]

3.56 m - Fault, 100 mm aperture, fault gouge, crushed rock, alpha angles = 46 and 40 degrees.

3.85 to 4.15 m - Broken rock, 50 to 100 mm blocks

5.62 m - Fault, 130 mm aperture, broken rock, fault gouge, unable to distinguish orientation

6.96 m - Fault, 90 mm aperture, fault gouge, crushed rock, 30 to 50 mm blocks, unable to distinguish orientation

(CONTINUED ON NEXT PAGE)

CLIENT: Abacus Mining and Exploration Corporation

PRINT DATE: : 7/26/2011

PROJECT: Ajax Project Feasibility Study

PROJECT NO. : 0712-003

DRILL HOLE # DH-BGC11-PS-25

CO-ORDINATES : 683,091.E, 5,610,906.N
GROUND ELEVATION (m) : 920
SURVEY METHOD :Handheld GPS
DATUM : NAD83
PLUNGE (°) : 90
TREND (°) : n/a

DRILL DESIGNATION : Zinex A5
DRILLING CONTRACTOR : Matrix
DRILL METHOD : Diamond
CORE SIZE : HQ
FLUID : water & polymer
CASED TO (m): 1.20

START DATE : 22 Apr 11
FINISH DATE : 22 Apr 11
FINAL DEPTH (m) : 11.3
DEPTH TO TOP OF ROCK (m) : 1.1
LOGGED BY : AR
REVIEWED BY : HWN

DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % / RQD % (20 40 60 80) | WEATHERING GRADE (2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / STRENGTH GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (10 20 30 40) | Joint Condition (Jc) (5 10 15 20) | RMR (20 40 60 80) | DEPTH (m)

9.52 m - Possible fault, 80 mm aperture, broken rock, 30 to 50 mm blocks, unable to distinguish orientation

10.57 to 10.75 m - Broken rock, alpha angles undistinguishable, 20 to 80 mm blocks.

END OF HOLE AT 11.30 m

Notes:
1. 2.5" PVC standpipe piezometer installed.
2. Drill hole backfilled with bentonite chips above the piezometer sandpack.
3. Elevation was extracted from DEM.

CLIENT: Abacus Mining and Exploration Corporation

PRINT DATE: : 7/26/2011

Survey Method : Handheld GPS
Co-ordinates (m) : 683,023.E, 5,611,044.N
Ground Elevation (m) : 933
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Zinex A5
Drilling Contractor : Matrix
Drill Method : Diamond
Core : HQ
Fluid : water & polymer
Casing : HW **Cased To (m)** : 2.75

Start Date : 22 Apr 11
Finish Date : 22 Apr 11
Final Depth of Hole (m): : 14.4
Depth to Top of Rock (m) : 2.75
Logged by : AR
Reviewed by : HWN

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details	DCT Blows per 300mm	SPT Blows per 150mm
0				OVERBURDEN SOIL (no recovery) Refer to TP-BGC11-PS-93 for soil description.			
3				Rock encountered at 2.75 m depth. See DH-BGC11-ND-26 rock log.			

Su - kPa: 40, 80, 120, 160
VANE / PEAK / REMOLD — FIELD ◆ ◇ — LAB ■ □
▲ UC/2
△ Pocket Pen /2
DCT (blows/300mm)
● SPT (blows/300mm)
★ % Fines
Hydraulic Conductivity (m/sec): 10^{-8} 10^{-6} 10^{-4} 10^{-2}
Core Recovery: 20 40 60 80
Moisture Content & SPT N: W_P% W% W_L%: 20 40 60 80

DRILL HOLE # DH-BGC11-ND-26

CO-ORDINATES : 683,023.E, 5,611,044.N
GROUND ELEVATION (m) : 933
SURVEY METHOD :Handheld GPS
DATUM : NAD83
PLUNGE (°) : 90
TREND (°) : n/a

DRILL DESIGNATION : Zinex A5
DRILLING CONTRACTOR : Matrix
DRILL METHOD : Diamond
CORE SIZE : HQ
FLUID : water & polymer
CASED TO (m): 2.75

START DATE : 22 Apr 11
FINISH DATE : 22 Apr 11
FINAL DEPTH (m) : 14.4
DEPTH TO TOP OF ROCK (m) : 2.8
LOGGED BY : AR
REVIEWED BY : HWN

DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % / RQD % (20 40 60 80) | WEATHERING GRADE (2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / STRENGTH GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (10 20 30 40) | Joint Condition (Jc) (5 10 15 20) | RMR (20 40 60 80) | DEPTH (m)

0 to 2.75 m - See DH-BGC11-ND-26 soil log.

BEDROCK
Intrusive, greenish grey, medium grained, massive, medium strong (R3), slightly to moderately weathered (W2-W3), two discontinuity sets (25-50°, 65-70° from core axis), discontinuity surfaces are medium strong, closely spaced, trace silt infill, trace iron oxide staining, small aperture, smooth to rough, magnetic minerals. [IRON MASK HYBRID]

3.30 to 3.50 m - Fractured rock, alpha angles undistinguishable, 30 to 80 mm blocks.

3.62 to 3.80 m - Fractured rock, alpha angles undistinguishable, 30 to 50 mm blocks.

7.43 to 8.50 m - Fault zone, alpha angles approximately < 30°, 20 to 150 mm blocks, fault gouge present.

(CONTINUED ON NEXT PAGE)

CLIENT: Abacus Mining and Exploration Corporation
PRINT DATE: : 7/26/2011

PROJECT: Ajax Project Feasibility Study

PROJECT NO. : 0712-003

DRILL HOLE # DH-BGC11-ND-26

CO-ORDINATES : 683,023.E, 5,611,044.N
GROUND ELEVATION (m) : 933
SURVEY METHOD :Handheld GPS
DATUM : NAD83
PLUNGE (°) : 90
TREND (°) : n/a

DRILL DESIGNATION : Zinex A5
DRILLING CONTRACTOR : Matrix
DRILL METHOD : Diamond
CORE SIZE : HQ
FLUID : water & polymer
CASED TO (m): 2.75

START DATE : 22 Apr 11
FINISH DATE : 22 Apr 11
FINAL DEPTH (m) : 14.4
DEPTH TO TOP OF ROCK (m) : 2.8
LOGGED BY : AR
REVIEWED BY : HWN

DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % / RQD % (20 40 60 80) | WEATHERING GRADE (2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / STRENGTH GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (10 20 30 40) | Joint Condition (Jc) (5 10 15 20) | RMR (20 40 60 80) | DEPTH (m)

8

9.30 to 9.45 m - Fractured rock, 30 to 50 mm blocks.

BEDROCK
Intrusive, grey, medium grained, massive, medium strong (R3), slightly weathered (W2), magnetic minerals. [POTHOOK DIORITE]

9

9.90 to 10.05 m - Fractured rock, 30 - 80 mm blocks.

10

10.52 to 11.80 m - Fractured rock, 50 to 110 mm blocks.

11

12

13

14

END OF HOLE AT 14.35 m

Notes:
1. 2.5" PVC standpipe piezometer installed.
2. Drill hole backfilled with bentonite chips above the piezometer sandpack.
3. Elevation was extracted from DEM

15

16

BGC

CLIENT: Abacus Mining and Exploration Corporation

PRINT DATE: : 7/26/2011

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC10-01

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 681103E, 5610712N
Ground Elevation: 888
Datum : NAD83

Excavator : Cat 320BL
Operator : Noel Johnston

Start Date : 19 Oct 10
Finish Date : 19 Oct 10
Final Depth of Pit (m) : 2.9
Logged by : MM
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					Roots, grass, silty
	G	M1			SILT (ML) Gravelly, sandy (fine), trace cobbles, low to no plasticity, dense to very dense, from 0.2 to 0.4 m dark brown, then medium brown, dry, moisture increases with depth, homogeneous, weak cementation, rootlets present. [TILL]
1					
2	G	M2			
	G	M3	III		MODERATELY WEATHERED BEDROCK (R3), bluish grey, hard scraping, fractured. [MAFIC VOLCANICS]
3					END OF TEST PIT AT 2.90 m (refusal on bedrock) Notes: 1. No water observed. 2. Elevation was extracted from DEM
4					
5					
6					
7					
8					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

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Client: Abacus Mining and Exploration Corporation

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC10-02

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 682957E, 5610695N
Ground Elevation: 907
Datum : NAD83

Excavator : Cat 320BL
Operator : Noel Johnston

Start Date : 19 Oct 10
Finish Date : 19 Oct 10
Final Depth of Pit (m) : 5.0
Logged by : MM
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					Roots, grass, silty
	G	M1			SILT (ML) Sandy (fine), low plasticity, loose to compact, light brown, dry, homogeneous, weak cementation, rootlets present
1					SILT (ML) Some fine sand, some clay, trace gravel, low plasticity, compact to dense, medium brown, damp, homogeneous, weak cementation.
	G	M2			1.2 m - Grain Size Analysis: 2% Gravel, 15% Sand, 65% Silt, 18% Clay
2					SILT (ML) Sandy (fine), trace clay, some gravel, some cobbles, trace clay, rounded to subrounded, low to medium plasticity, dense to very dense, dark brown, moist, homogeneous. [TILL]
3					
4					
5	G	M3			END OF TEST PIT AT 5.0 m (refusal on bedrock) Notes: 1. No water observed. 2. Elevation was extracted from DEM
6					
7					
8					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
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Client: Abacus Mining and Exploration Corporation

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC10-03

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 684357E, 5610959N
Ground Elevation: 959
Datum : NAD83

Excavator : Cat 320BL
Operator : Noel Johnston

Start Date : 19 Oct 10
Finish Date : 19 Oct 10
Final Depth of Pit (m) : 5.0
Logged by : MM
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					Grass, roots, silty
					SAND (SM) Fine grained, silty, gravelly, trace cobbles, moderately to well graded, compact, light brown, dry, homogeneous, weak cementation, top 200 mm dark brown. [TILL]
1	G	M1			
2					2.1 m - Moisture increases,some cobbles, trace to some clay.
3					
4					
5	G	M2			4.9 m - Grain Size Analysis: 23% Gravel, 39% Sand, 38% Fines.
					END OF TEST PIT AT 5.0 m (maximum reach of excavator)
6					Notes: 1. No water observed. 2. Elevation was extracted from DEM
7					
8					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

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Client: Abacus Mining and Exploration Corporation

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC10-04

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 684002E, 5611183N
Ground Elevation: 994
Datum : NAD83

Excavator : Cat 320BL
Operator : Noel Johnston

Start Date : 20 Oct 10
Finish Date : 20 Oct 10
Final Depth of Pit (m) : 5.1
Logged by : MM
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					Grass, roots, silty, topsoil, dark brown.
1	G	M1			GRAVEL (GW) Some sand, trace silt, trace cobbles, well graded, compact to dense, maximum particle size 150 mm, rounded to subrounded, light brown, dry. [TILL]
2					2.0 m - Trace boulders, increased cementation to moderate at bottom.
3					
4					
5	G	M2			END OF TEST PIT AT 5.1 m (maximum reach of excavator) Notes: 1. No water observed 2. Elevation was extracted from DEM
6					
7					
8					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines
Moisture Content
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
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Client: Abacus Mining and Exploration Corporation

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC10-05

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 683145E, 5610844N
Ground Elevation: 916
Datum : NAD83

Excavator : Cat 320BL
Operator : Noel Johnston

Start Date : 20 Oct 10
Finish Date : 20 Oct 10
Final Depth of Pit (m) : 2.1
Logged by : MM
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					Grass, roots, sods.
					SILT (ML) Some fine sand, trace gravel, trace cobbles,trace clay, low plasticity, dense, light brown, dry, homogeneous, weak cementation.
1	G	M1			1.0 m - Grain Size Analysis: 15% Gravel, 13% Sand, 58% Silt, 14% Clay
2	G	M2	III		MODERATELY WEATHERED BEDROCK (R3), bluish grey, fractured. [IRON MASK HYBRID]
					END OF TEST PIT AT 2.1 m (refusal on bedrock)
3					Notes: 1. No water observed 2. Elevation was extracted from DEM
4					
5					
6					
7					
8					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

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Client: Abacus Mining and Exploration Corporation

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC10-06

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 682597E, 5610643N
Ground Elevation: 926
Datum : NAD83

Excavator : Cat 320BL
Operator : Noel Johnston

Start Date : 20 Oct 10
Finish Date : 20 Oct 10
Final Depth of Pit (m) : 5.0
Logged by : MM
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					Grass, roots, dark brown, topsoil.
					SILT (ML) Sandy (fine), gravelly, some cobbles, trace clay, trace boulders, low plasticity, compact to dense,light brown, dry, homogeneous, weak cementation. [TILL]
1	G	M1			
2					2.0 m - moisture and cementation increase.
3					
4	G	M2			
5					END OF TEST PIT AT 5.0 m (maximum reach of excavator) Notes: 1. No water observed. 2. Elevation was extracted from DEM
6					
7					
8					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

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Client: Abacus Mining and Exploration Corporation

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC10-07

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 682118E, 5610627N
Ground Elevation: 940
Datum : NAD83

Excavator : Cat 320BL
Operator : Noel Johnston

Start Date : 20 Oct 10
Finish Date : 20 Oct 10
Final Depth of Pit (m) : 5.8
Logged by : MM
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					Grass, roots, dark brown, silty.
					SAND (SP) Fine grained, some gravel, some silt, trace cobbles, poorly graded, compact, maximum particle size 100 mm, rounded to subrounded to subangular, light brown, dry, weak cementation. [TILL]
1	G	M1			
					1.5 m - cobble and gravel content increases.
2					2.0 m - moisture increases.
3					
4					
5					
5.8	G	M2			
					END OF TEST PIT AT 5.8 m (maximum reach of excavator)
6					Notes: 1. No water observed 2. Elevation was extracted from DEM
7					
8					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines
Moisture Content
W_P% W% W_L%
20 40 60 80

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: Abacus Mining and Exploration Corporation

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC10-08

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 683180E, 5611317N
Ground Elevation: 940
Datum : NAD83

Excavator : Cat 320BL
Operator : Noel Johnston

Start Date : 21 Oct 10
Finish Date : 21 Oct 10
Final Depth of Pit (m) : 5.0
Logged by : MM
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					Grass, roots, topsoil and root material.
1	G	M1			SILT (ML) Sandy (fine), trace gravel, trace clay, low plasticity, compact, light brown, dry, homogeneous, weak cementation, rootlets. 0.8 m - Grain Size Analysis: 13% Gravel, 34% Sand, 43% Silt, 10% Clay
2					SILT (ML) Sandy, some gravel to gravelly, some cobbles, trace boulders 300 mm in size, low plasticity, dense to very dense, medium brown, moist, homogeneous, weak to moderate cementation with depth. [TILL]
3					
4					
5	G	M2			END OF TEST PIT AT 5.0 m (maximum reach of excavator) Notes: 1. Standing water 10 m from hole. 2. No water observed. 3. Elevation was extracted from DEM
6					
7					
8					

Su - kPa
40 80 120 160
VANE FIELD LAB
PEAK ◆ ■
REMOLD ◇ □
▲ UC/2
△ Pocket Pen /2
★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: Abacus Mining and Exploration Corporation

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC10-09

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 682816E, 5611409N
Ground Elevation: 966
Datum : NAD83

Excavator : Cat 320BL
Operator : Noel Johnston

Start Date : 21 Oct 10
Finish Date : 21 Oct 10
Final Depth of Pit (m) : 5.2
Logged by : MM
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					Grass, roots, silty, topsoil.
	G	M1			SAND (SW) Fine grained, gravelly, some cobbles, some silt, some clay, trace boulders, well graded, compact to dense, maximum particle size 300 mm, rounded to subangular, light brown, dry to moist with depth, homogeneous, weak to moderate cementation with depth [TILL]
4	G	M2			3.8 m - Grain Size Analysis: 14% Gravel, 48% Sand, 38% Fines
5					END OF TEST PIT AT 5.2 m (maximum reach of excavator) Notes: 1. No water observed. 2. Elevation was extracted from DEM

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: Abacus Mining and Exploration Corporation

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC10-10

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 682880E, 5611776N
Ground Elevation: 959
Datum : NAD83

Excavator : Cat 320BL
Operator : Noel Johnston

Start Date : 21 Oct 10
Finish Date : 21 Oct 10
Final Depth of Pit (m) : 4.9
Logged by : MM
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					Grass, roots, dark brown, silty.
					SILT (ML) Sandy (fine), some gravel to gravelly, trace cobbles, low plasticity, compact, light brown, dry, homogenous, weak cementation. [TILL]
1	G	M1			
					SAND and GRAVEL (GW/SW) Trace cobbles, well graded, compact, maximum particle size 150 mm, angular, very light brown to tan, moist, homogeneous, no cementation. [TILL]
2					
	G	M2			2.6 m - Grain Size Analysis: 55% Gravel, 38% Sand, 7% Fines.
3					
4					
	G	M3			
5					END OF TEST PIT AT 4.9 m (maximum reach of excavator) Notes: 1. No water observed. 2. Elevation was extracted from DEM
6					
7					
8					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines
Moisture Content
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: Abacus Mining and Exploration Corporation

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC10-11

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 683165E, 5611703N
Ground Elevation: 943
Datum : NAD83

Excavator : Cat 320BL
Operator : Noel Johnston

Start Date : 21 Oct 10
Finish Date : 21 Oct 10
Final Depth of Pit (m) : 5.2
Logged by : MM
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0	G	M1			SILT (OL) Low plasticity, compact, black, dry, homogeneous, weak cementation. [PEAT]
					SILT (ML) Sandy (fine), trace gravel, low plasticity, compact, dark grey, dry, homogeneous, weak cementation.
1	G	M2			SAND (SP) Fine grained, some silt, trace gravel, trace cobbles, poorly graded, compact, orangish, brownish, light grey, moist, homogeneous, no cementation. [TILL]
					SAND and GRAVEL (GW/SW) Some cobbles, some silt to silty, trace boulders, well graded, compact, rounded to subrounded, dark brown, very moist, homogeneous. [TILL]
2					
3					
4					
5	G	M3			5.2 m - Grain Size Analysis: 42% Gravel, 31% Sand, 27% Fines.
					END OF TEST PIT AT 5.2 m (maximum reach of excavator)
6					Notes: 1. No water observed. 2. Test hole is located in depression which likely held water some time ago. 3. Elevation was extracted from DEM
7					
8					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

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AN APPLIED EARTH SCIENCES COMPANY

Client: Abacus Mining and Exploration Corporation

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC10-12

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 683244E, 5612097N
Ground Elevation: 943
Datum : NAD83

Excavator : Cat 320BL
Operator : Noel Johnston

Start Date : 21 Oct 10
Finish Date : 21 Oct 10
Final Depth of Pit (m) : 5.3
Logged by : MM
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					Grass, roots, silty.
					SAND (SW) Gravelly, trace silt, trace cobbles, trace boulders, well graded, compact, maximum particle size 300 mm, rounded to subrounded, dark brown, moist, homogeneous, weak cementation. [TILL]
1	G	M1			
2					
					2.5 m - Cementation increase to moderate, some silt, trace clay.
3					
4					
5	G	M2			
	G	M3			5.2 m - Grain Size Analysis: 18% Gravel, 29% Sand, 53% Fines
					CLAY (CH) and SILT High plasticity, stiff to very stiff, brown, moist. 5.3 m - Grain Size Analysis: 39% Silt, 61% Clay
6					END OF TEST PIT AT 5.3 m (maximum reach of excavator)
					Notes: 1. No water observed. 2. Material at bottom of hole is shiny, high plasticity clay, see sample M3. 3. Elevation was extracted from DEM
7					
8					

Su - kPa
40 80 120 160
VANE FIELD LAB
PEAK ◆ ■
REMOLD ◇ □
▲ UC/2
△ Pocket Pen /2
★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

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Client: Abacus Mining and Exploration Corporation

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC10-13

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 683100E, 5612589N
Ground Elevation: 963
Datum : NAD83

Excavator : Cat 320BL
Operator : Noel Johnston

Start Date : 22 Oct 10
Finish Date : 22 Oct 10
Final Depth of Pit (m) : 5.0
Logged by : MM
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					Grass, roots, silty, some gravel.
					GRAVEL and SAND (GW/SW) Trace silt, trace cobbles, well graded, compact, maximum particle size 150 mm, rounded to subrounded, light brown, dry, homogeneous, no cementation. [TILL]
1	G	M1			1.0 m - Grain Size Analyses: 46% Gravel, 46% Sand, 8% Fines and 45% Gravel, 36% Sand, 19% Fines
2					1.7 m - Some cobbles,trace boulders, compact to dense, moist, weak to strong cementation.
3					
4					
5					END OF TEST PIT AT 5.0 m (refusal on strongly cemented till) Notes: 1. No water observed. 2. Elevation was extracted from DEM
6					
7					
8					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

○ ★

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

BGC ENGINEERING INC.
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Client: Abacus Mining and Exploration Corporation

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC10-14

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 682509E, 5612777N
Ground Elevation: 953
Datum : NAD83

Excavator : Cat 320BL
Operator : Noel Johnston

Start Date : 22 Oct 10
Finish Date : 22 Oct 10
Final Depth of Pit (m) : 5.0
Logged by : MM
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					Grass, rootmat, silty.
					SAND (SP) Fine grained, gravelly, some cobbles, trace silt, trace boulders, poorly graded, compact to dense, maximum particle size 250 mm, subrounded, light brown, dry, homogeneous, weak cementation. [TILL]
2					2.0 m - damp, very dense.
3					3.5 m - moderately cemented
5					END OF TEST PIT AT 5.0 m (maximum reach of excavator) Notes: 1. No water observed. 2. Very hard digging. 3. No samples collected. 4. Elevation was extracted from DEM

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines
Moisture Content
W_P% W% W_L%
20 40 60 80

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Client: Abacus Mining and Exploration Corporation

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC10-15

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 682031E, 5612900N
Ground Elevation: 922
Datum : NAD83

Excavator : Cat 320BL
Operator : Noel Johnston

Start Date : 22 Oct 10
Finish Date : 22 Oct 10
Final Depth of Pit (m) : 4.2
Logged by : MM
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					Grass, rootmat, silty topsoil.
1	G	M1			SAND (SP) and GRAVEL Fine grained, trace cobbles, trace boulders, poorly graded, compact to dense, maximum particle size 300 mm, subrounded, light brown, damp, homogeneous, weak cementation. [TILL]
2					
3					2.8 m - Moderately cemented.
4					END OF TEST PIT AT 4.2 m (refusal on hard till) Notes: 1. No water observed. 2. Elevation was extracted from DEM
5					
6					
7					
8					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines
Moisture Content
W_P% W% W_L%
20 40 60 80

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Client: Abacus Mining and Exploration Corporation

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC10-16

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 682140E, 5612341N
Ground Elevation: 917
Datum : NAD83

Excavator : Cat 320BL
Operator : Noel Johnston

Start Date : 22 Oct 10
Finish Date : 22 Oct 10
Final Depth of Pit (m) : 3.8
Logged by : MM
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					Grass, rootmat, topsoil.
					SAND (SW) Fine grained, gravelly, some cobbles, trace silt, trace boulders, well graded, compact, maximum particle size 250 mm, subangular to rounded, light brown, dry, homogeneous, weak cementation. [TILL]
1					
2			III		MODERATELY WEATHERED BEDROCK Highly fractured, (R3), iron staining, rippable, white and black. [IRON MASK HYBRID]
3	G	M1			
4					END OF TEST PIT AT 3.8 m (refusal on bedrock) Notes: 1. No water observed. 2. Elevation was extracted from DEM
5					
6					
7					
8					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines
Moisture Content
W_P% W% W_L%
20 40 60 80

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Client: Abacus Mining and Exploration Corporation

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC10-17

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 681140E, 5612030N
Ground Elevation: 895
Datum : NAD83

Excavator : Cat 320BL
Operator : Noel Johnston

Start Date : 23 Oct 10
Finish Date : 23 Oct 10
Final Depth of Pit (m) : 4.6
Logged by : MM
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					Grass, rootmat, silty topsoil, dark brown.
					SAND (SW) and GRAVEL Fine grained, trace silt, trace cobbles, well graded, compact to dense, maximum particle size 150 mm, subrounded to subangular, light brown, dry, homogeneous, weak cementation, rootlets to 1.0 m. [TILL]
1	G	M1			1.0 m - Grain Size Analysis: 42% Gravel, 43% Sand, 15% Fines.
2					
3			III-IV		HIGHLY TO MODERATELY WEATHERED BEDROCK Highly fractured, iron stained, (R3), bluish grey. [IRON MASK HYBRID]
4	G	M2			
5					END OF TEST PIT AT 4.6 m (refusal on bedrock) Notes: 1. No water observed. 2. Elevation was extracted from DEM
6					
7					
8					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines
Moisture Content
W_P% W% W_L%
20 40 60 80

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AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC10-18

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 681145E, 5611708N
Ground Elevation: 869
Datum : NAD83

Excavator : Cat 320BL
Operator : Noel Johnston

Start Date : 23 Oct 10
Finish Date : 23 Oct 10
Final Depth of Pit (m) : 5.1
Logged by : MM
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					Grass, roots, topsoil, dark brown.
					SAND (SW) and GRAVEL Fine grained, trace silt, trace cobbles, well graded, compact to dense, maximum particle size 150 mm, subrounded to subangular, light brown, dry, homogeneous, weak cementation, rootlets to 1.2 m. [TILL]
1					
					1.5 m - trace boulders
2					
					3.0 m - moist
3					
4					SAND (SP) and GRAVEL Coarse grained, some cobbles, poorly graded, dense, grey brown, wet, homogeneous. [TILL]
5	G	M1			SILT (ML) Gravelly, sandy, some cobbles, low plasticity, very dense, dark brown, moist, moderate cementation. [TILL]
					END OF TEST PIT AT 5.1 m (maximum reach of excavator)
					Notes: 1. Water observed entering test pit at 4.0 m. 2. Elevation was extracted from DEM
6					
7					
8					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

○

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Client: Abacus Mining and Exploration Corporation

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC10-19

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 681439E, 5611671N
Ground Elevation: 918
Datum : NAD83

Excavator : Cat 320DL
Operator : Noel Johnston

Start Date : 23 Oct 10
Finish Date : 23 Oct 10
Final Depth of Pit (m) : 2.2
Logged by : MM
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					Grass, roots, topsoil, dark brown.
					SAND (SP) and GRAVEL Fine grained, some cobbles, trace boulders, poorly graded, dense, maximum particle size 300 mm, rounded to subangular, light brown, dry, homogeneous, moderate cementation. [TILL]
2	G	M1	III		MODERATELY WEATHERED BEDROCK Bluish, (R3), very hard scraping, couldn't dig into rock. [SUGARLOAF DIORITE]
					END OF TEST PIT AT 2.2 m (refusal on bedrock) Notes: 1. No water observed. 2. Uncertain if refusal was on bedrock, or a large boulder. 3. Elevation was extracted from DEM

Su - kPa: 40, 80, 120, 160

VANE PEAK ▲ UC/2
FIELD ◆ ■
REMOLD ◇ □ △ Pocket Pen /2

★ % Fines

Moisture Content: W_P% × — W% ○ — W_L% ×; 20, 40, 60, 80

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Client: Abacus Mining and Exploration Corporation

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC10-20

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 681432E, 5611233N
Ground Elevation: 934
Datum : NAD83

Excavator : Cat 320DL
Operator : Noel Johnston

Start Date : 23 Oct 10
Finish Date : 23 Oct 10
Final Depth of Pit (m) : 1.3
Logged by : MM
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					Topsoil, moss, roots, grass
			III-IV		HIGHLY TO MODERATELY WEATHERED BEDROCK Highly fractured, iron stained, black and white, R3. [SUGARLOAF DIORITE]
1	G	M1			
					END OF TEST PIT AT 1.3 m (refusal on bedrock) Notes: 1. No water observed. 2. Visible outcrop. 3. Elevation was extracted from DEM
2					
3					
4					
5					
6					
7					
8					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

BGC ENGINEERING INC.
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Client: Abacus Mining and Exploration Corporation

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC10-21

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 681096E, 5611350N
Ground Elevation: 899
Datum : NAD83

Excavator : Cat 320DL
Operator : Noel Johnston

Start Date : 23 Oct 10
Finish Date : 23 Oct 10
Final Depth of Pit (m) : 5.3
Logged by : MM
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					Grass, roots, topsoil, dark brown.
					SILT (ML) Sandy (fine), trace gravel, low plasticity, dense, light brown, dry, homogeneous, moderate cementation.
1	G	M1			
					SAND (SM) Fine grained, silty, gravelly, trace cobbles, trace boulders, well graded, dense, maximum particle size 400 mm, subrounded to subangular, light brown, dry, homogeneous, moderate cementation. [TILL] 1.5 m - some silt, damp.
2					
3					
4					
5	G	M2			
					5.3 m - Grain Size Analysis: 20% Gravel, 39% Sand, 41% Fines.
					END OF TEST PIT AT 5.3 m (maximum reach of excavator)
6					Notes: 1. No water observed. 2. Elevation was extracted from DEM
7					
8					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

○ (1 m)
○ ★ (5 m)

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Client: Abacus Mining and Exploration Corporation

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC10-22

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 681119E, 5611046N
Ground Elevation: 905
Datum : NAD83

Excavator : Cat 320DL
Operator : Roland

Start Date : 25 Oct 10
Finish Date : 25 Oct 10
Final Depth of Pit (m) : 5.2
Logged by : MM
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					Grass, rootmat, dark brown, silty.
					SAND (SW) Fine grained, some gravel to gravelly, trace silt, trace cobbles, well graded, compact, maximum particle size 100 mm, subrounded to subangular, medium brown, dry, homogeneous, weak cementation. [TILL]
1	G	M1			
2					2.0 m - trace boulders (250 mm in size), moist.
3					
4					4.0 m - some silt, moderate cementation
5	G	M2			
					5.2 m - water entering test pit on bedrock.
					END OF TEST PIT AT 5.2 m (refusal on bedrock)
6					Notes: 1. Rock is very hard, couldn't break for sample. 2. Water observed entering test pit at 5.2 m. 3. Elevation was extracted from DEM
7					
8					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

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Client: Abacus Mining and Exploration Corporation

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC10-23

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 681551E, 5610650N
Ground Elevation: 946
Datum : NAD83

Excavator : Cat 320DL
Operator : Roland

Start Date : 25 Oct 10
Finish Date : 25 Oct 10
Final Depth of Pit (m) : 5.2
Logged by : MM
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					Grass, rootmat, silty, dark brown.
					SAND (SW) Fine grained, some silt, some gravel, well graded, loose to compact, subrounded, brown, dry, homogeneous. [TILL]
1					SAND (SW) Gravelly, some silt, some cobbles, trace boulders, well graded, dense, maximum particle size 300 mm, subangular to subrounded, light brown, dry, homogeneous, moderate cementation. [TILL] Moisture increases to damp with depth
2					
3					
4					
5					
					END OF TEST PIT AT 5.2 m (maximum reach of excavator) Notes: 1. No water observed. 2. No samples collected. 3. Elevation was extracted from DEM
6					
7					
8					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

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Client: Abacus Mining and Exploration Corporation

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC10-24

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 681388E, 5610848N
Ground Elevation: 962
Datum : NAD83

Excavator : Cat 320DL
Operator : Roland

Start Date : 25 Oct 10
Finish Date : 25 Oct 10
Final Depth of Pit (m) : 5.1
Logged by : MM
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					Grass, rootmat, silty, dark brown.
					SAND (SW) Fine grained, some gravel, trace to some silt, trace cobbles, well graded, compact to dense, maximum particle size 150 mm, subrounded to subangular, light brown, dry, homogeneous, weak to moderate cementation. [TILL]
1	G	M1			1.0 m - damp
2					
3					
4					
5	G	M2	III-IV		HIGHLY TO MODERATELY WEATHERED BEDROCK Highly fractured, iron stained, greenish grey, R3. [IRON MASK HYBRID]
					END OF TEST PIT AT 5.1 m (refusal on bedrock / maximum reach of the excavator)
6					Notes: 1. No water observed. 2. Elevation was extracted from DEM
7					
8					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

BGC ENGINEERING INC.
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Client: Abacus Mining and Exploration Corporation

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC10-25

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 683840E, 5611378N
Ground Elevation: 995
Datum : NAD83

Excavator : Cat 320DL
Operator : Roland

Start Date : 25 Oct 10
Finish Date : 25 Oct 10
Final Depth of Pit (m) : 5.2
Logged by : MM
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					Grass, rootmat, topsoil, dark brown, moist.
					SAND (SM) Fine grained, gravelly, silty, some cobbles, well graded, very dense, maximum particle size 150 mm, rounded to subangular, light brown, dry, homogeneous, moderate cementation. [TILL]
1	G	M1			0.8 m - Grain Size Analysis: 31% Gravel, 38% Sand, 31% Fines.
2					2.0 m - damp, some silt
3					
4					
5	G	M2			
					END OF TEST PIT AT 5.2 m (maximum reach of excavator)
6					Notes: 1. No water observed 2. Elevation was extracted from DEM
7					
8					

Su - kPa: 40, 80, 120, 160

	FIELD	LAB	
VANE			▲ UC/2
PEAK	◆	■	
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content: W_P% × — — — ○ W% — — — × W_L%; 20, 40, 60, 80

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

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Client: Abacus Mining and Exploration Corporation

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC10-26

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 684321E, 5611369N
Ground Elevation: 976
Datum : NAD83

Excavator : Cat 320DL
Operator : Roland

Start Date : 26 Oct 10
Finish Date : 26 Oct 10
Final Depth of Pit (m) : 5.0
Logged by : MM
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					Grass, rootmat, dark brown, topsoil.
					SAND (SM) Fine grained, gravelly, silty, some cobbles, trace boulders, well graded, dense to very dense, maximum particle size 250 mm, subrounded to subangular, light brown, dry, homogeneous, moderate cementation. [TILL]
1	G	M1			Material becomes moist with depth. 1.0 m - Grain Size Analysis: 34% Gravel, 32% Sand, 34% Fines.
5					END OF TEST PIT AT 5.0 m (maximum reach of excavator) Notes: 1. No water observed. 2. Elevation was extracted from DEM

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: Abacus Mining and Exploration Corporation

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC10-27

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 684170E, 5611790N
Ground Elevation: 974
Datum : NAD83

Excavator : Cat 320DL
Operator : Roland

Start Date : 26 Oct 10
Finish Date : 26 Oct 10
Final Depth of Pit (m) : 4.7
Logged by : MM
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					Grass, topsoil, rootmat, dark brown.
	G	M1			SILT (ML) Sandy (fine), low plasticity, loose to compact, medium brown, dry, homogeneous, weak cementation. 0.5 m - Grain Size Analysis: 1% Gravel, 37% Sand, 46% Silt, 16% Clay
1	G	M2			SAND (SW) Fine grained, some gravel, trace silt, trace cobbles, well graded, compact, maximum particle size 100 mm, rounded to subangular, light brown, dry, homogeneous, weak cementation. [TILL]
2					
					2.5 m - some silt, moist, trace boulders 300 mm in size.
3					
4					
5					END OF TEST PIT AT 4.7 m (refusal on bedrock?) Notes: 1. No water observed. 2. Elevation was extracted from DEM
6					
7					
8					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: Abacus Mining and Exploration Corporation

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC10-28

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 683641E, 5612483N
Ground Elevation: 939
Datum : NAD83

Excavator : Cat 320DL
Operator : Roland

Start Date : 26 Oct 10
Finish Date : 26 Oct 10
Final Depth of Pit (m) : 3.0
Logged by : MM
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					Grass, rootmat
					GRAVEL (GW) Sandy, trace cobbles, well graded, loose, maximum particle size 150 mm, subangular to subrounded, light brown, dry, homogeneous, no cementation.
1	G	M1			1.0 m - Grain Size Analyses: 58% Gravel, 38% Sand, 4% Fines and 60% Gravel, 37% Sand, 3% Fines
2					
3					END OF TEST PIT AT 3.0 m (refusal due to sloughing)
4					Notes: 1. No water observed. 2. Dried up lake ~100 m away 3. Elevation was extracted from DEM
5					
6					
7					
8					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines
Moisture Content
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: Abacus Mining and Exploration Corporation

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC10-29

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 685608E, 5609562N
Ground Elevation: 905
Datum : NAD83

Excavator : Cat 320DL
Operator : Roland

Start Date : 27 Oct 10
Finish Date : 27 Oct 10
Final Depth of Pit (m) : 5.1
Logged by : MM
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					Rootmat, grass, dark brown topsoil
					SAND (SP) Fine grained, some gravel, some cobbles, trace silt, compact, maximum particle size 200 mm, subrounded to subangular, light brown, dry, homogeneous, weak cementation. [TILL]
1					
2					
					2.5 m - moderate cementation, gravelly, dense.
3					
4					
5					END OF TEST PIT AT 5.1 m (maximum reach of excavator)
					Notes: 1. Scraping on highly weathered bedrock, orange. 2. No water observed. 3. No samples collected. 4. Elevation was extracted from DEM
6					
7					
8					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: Abacus Mining and Exploration Corporation

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC10-30

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 685644E, 5609904N
Ground Elevation: 935
Datum : NAD83

Excavator : Cat 320DL
Operator : Roland

Start Date : 27 Oct 10
Finish Date : 27 Oct 10
Final Depth of Pit (m) : 5.9
Logged by : MM
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					Grass, rootmat, dark brown, topsoil
	G	M1			SILT (ML) Sandy (fine), trace to some gravel, trace cobbles, low plasticity, compact, light brown, dry, homogeneous, weak cementation.
1					
2					SAND (SW) Fine grained, some silt, some gravel, some cobbles, trace boulder (250 mm), well graded, dense, subrounded to subangular, light brown, damp, homogeneous, weak cementation. [TILL]
3					
4					
5					4.5 m - silty, moist.
	G	M2			
6					END OF TEST PIT AT 5.9 m (maximum reach of excavator) Notes: 1. No water observed. 2. Elevation was extracted from DEM
7					
8					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

○ (M1)
○ (M2)

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Client: Abacus Mining and Exploration Corporation

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC10-31

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 685682E, 5610240N
Ground Elevation: 945
Datum : NAD83

Excavator : Cat 320DL
Operator : Roland

Start Date : 27 Oct 10
Finish Date : 27 Oct 10
Final Depth of Pit (m) : 5.1
Logged by : MM
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					Grass, rootmat, dark brown, silty topsoil.
1	G	M1			SAND (SW) Gravelly, some silt, trace cobbles, trace boulders, well graded, dense, maximum particle size 250 mm, subangular to subrounded, light brown, dry, moderate cementation. [TILL]
2					1.5 m - medium brown, difficult digging
3					
4					
5					END OF TEST PIT AT 5.1 m (maximum reach of excavator)
6					Notes: 1. No water observed. 2. Elevation was extracted from DEM
7					
8					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines
Moisture Content
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
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Client: Abacus Mining and Exploration Corporation

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC10-32

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 685651E, 5610541N
Ground Elevation: 964
Datum : NAD83

Excavator : Cat 320DL
Operator : Roland

Start Date : 27 Oct 10
Finish Date : 27 Oct 10
Final Depth of Pit (m) : 6.2
Logged by : MM
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					Grass, rootmat, topsoil, dark brown, silty.
					SILT (ML) Sandy (fine), trace gravel, trace cobbles, low plasticity, loose to compact, maximum particle size 100 mm, light brown, dry, homogeneous, weak to moderate cementation.
2					SAND (SM) Fine grained, silty, gravelly, some cobbles, trace boulders, well graded, compact to dense, maximum particle size 300 mm, subangular to subrounded, medium brown, damp to moist, homogeneous, weak to moderate comentation. [TILL]
4	G	M1			
6					6.0 to 6.2 m - grey brown, trace clay with silt.
					END OF TEST PIT AT 6.2 m (maximum reach of excavator). Notes: 1. No water observed. 2. Elevation was extracted from DEM
8					

Su - kPa: 40, 80, 120, 160

	FIELD	LAB	
VANE			▲ UC/2
PEAK	◆	■	
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content: W_P% × — — — ○ — — — × W_L%; 20, 40, 60, 80

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AN APPLIED EARTH SCIENCES COMPANY

Client: Abacus Mining and Exploration Corporation

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC10-33

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 686003E, 5610552N
Ground Elevation: 962
Datum : NAD83

Excavator : Cat 320DL
Operator : Roland

Start Date : 28 Oct 10
Finish Date : 28 Oct 10
Final Depth of Pit (m) : 6.1
Logged by : MM
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					SILT (ML) Trace gravel, trace sand, low plasticity, compact, dark brown, dry, homogeneous, weak cementation. [TOPSOIL]
1					SAND (SP) Fine grained, gravelly, trace silt, trace cobbles, poorly graded, compact, maximum particle size 100 mm, subangular to subrounded, light brown, dry, homogeneous, weak to moderate cementation. [TILL]
2					
3					
4					
5					GRAVEL (GW) Sandy, some silt, trace clay, trace cobbles, dense to very dense, medium brown, moist, homogeneous, no cementation. [TILL]
6	G	M1			6.0 m - water dripping into test pit. Grain Size Analysis: 42% Gravel, 27% Sand, 19% Silt, 12% Clay.
7					END OF TEST PIT AT 6.1 m (maximum reach of excavator) Notes: 1. Water entering test pit at 6.0 m. 2. Elevation was extracted from DEM
8					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

○ ★

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: Abacus Mining and Exploration Corporation

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC10-34

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 686552E, 5610552N
Ground Elevation: 997
Datum : NAD83

Excavator : Cat 320DL
Operator : Roland

Start Date : 28 Oct 10
Finish Date : 28 Oct 10
Final Depth of Pit (m) : 4.6
Logged by : MM
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					Grass, rootmat, dark brown, silty topsoil.
					SAND (SM) Fine grained, silty, gravelly, some cobbles, well graded, compact to dense, maximum particle size 200 mm, subangular to subrounded, light brown, dry, weak to moderate cementation. [TILL]
4.6					END OF TEST PIT AT 4.6 m (refusal on bedrock)

Notes:
1. No water observed.
2. Hard digging by excavator at depth.
3. No samples collected.
4. Elevation was extracted from DEM

Su - kPa: 40, 80, 120, 160
VANE PEAK ◆ ■ ▲ UC/2
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines
Moisture Content: W_P% × — W% ○ — W_L% ×; 20, 40, 60, 80

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AN APPLIED EARTH SCIENCES COMPANY

Client: Abacus Mining and Exploration Corporation

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC10-35

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 686018E, 5610260N
Ground Elevation: 944
Datum : NAD83

Excavator : Cat 320DL
Operator : Roland

Start Date : 29 Oct 10
Finish Date : 29 Oct 10
Final Depth of Pit (m) : 5.1
Logged by : MM
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					Grass, rootmat, dark brown, topsoil.
	G	M1			SILT (ML) Clayey, some sand, low plasticity, loose to compact, light brown, dry, homogeneous, weak cementation. 0.6 m - Grain Size Analysis: 11% Sand, 62% Silt, 27% Clay
1					
2					SILT (ML) Some clay, some sand, some gravel, some cobbles, high plasticity, very stiff, medium brown, moist, homogeneous. [TILL]
3					
4					
5	G	M2			END OF TEST PIT AT 5.1 m (maximum reach of excavator) Notes: 1. No water observed. 2. Elevation was extracted from DEM
6					
7					
8					

Su - kPa: 40, 80, 120, 160

VANE PEAK ◆ REMOLD ◇ FIELD ■ LAB □ ▲ UC/2 △ Pocket Pen /2

★ % Fines

Moisture Content: W_P% × — W% ○ — W_L% ×; 20, 40, 60, 80

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Client: Abacus Mining and Exploration Corporation

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC10-36

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 686060E, 5609868N
Ground Elevation: 964
Datum : NAD83

Excavator : Cat 320DL
Operator : Roland

Start Date : 29 Oct 10
Finish Date : 29 Oct 10
Final Depth of Pit (m) : 5.0
Logged by : MM
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					Grass, rootmat, dark brown, silty topsoil.
	G	M1			GRAVEL (GW) and SAND, Some cobbles, some silt, trace boulders, well graded, compact to dense, maximum particle size 250 mm, subrounded to subangular, light brown, dry, homogeneous, weak cementation. [TILL] 0.5 m - Grain Size Analysis: 36% Gravel, 32% Sand, 32% Fines 1.2 m - less gravel.
4					4.0 m - trace to some silt, moist, very dense.
	G	M2			
5					END OF TEST PIT AT 5.0 m (maximum reach of excavator) Notes: 1. No water observed. 2. Elevation was extracted from DEM

Su - kPa: 40, 80, 120, 160

VANE PEAK ◆ ■ ▲ UC/2
REMOLD ◇ □ △ Pocket Pen /2

★ % Fines

Moisture Content: W_P% W% W_L%
20, 40, 60, 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: Abacus Mining and Exploration Corporation

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC10-37

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 686153E, 5609446N
Ground Elevation: 901
Datum : NAD83

Excavator : Cat 320DL
Operator : Roland

Start Date : 29 Oct 10
Finish Date : 29 Oct 10
Final Depth of Pit (m) : 5.2
Logged by : MM
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					Grass, rootmat, dark brown, silty topsoil.
					SAND (SW) Fine grained, some gravel, some cobbles, some boulders, trace to some silt, well graded, compact, maximum particle size 300 mm, subangular to subrounded, light brown, dry, homogeneous, weak cementation. [TILL]
4					4.0 m - damp
5	G	M1			
					END OF TEST PIT AT 5.2 m (maximum reach of excavator) Notes: 1. No water observed. 2. Elevation was extracted from DEM

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines
Moisture Content
W_P% W% W_L%
20 40 60 80

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AN APPLIED EARTH SCIENCES COMPANY

Client: Abacus Mining and Exploration Corporation

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC10-38

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 686717E, 5609280N
Ground Elevation: 888
Datum : NAD83

Excavator : Cat 320DL
Operator : Roland

Start Date : 29 Oct 10
Finish Date : 29 Oct 10
Final Depth of Pit (m) : 3.5
Logged by : MM
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0	G	M1			GRAVEL (GW) and SAND Some cobbles, loose, maximum particle size 100 mm, rounded to subrounded, brown, moist, layered, no cementation. [FILL] 0.5 m - Grain Size Analysis: 53% Gravel, 44% Sand, 3% Fines
2					SAND (SW) Trace to some gravel, trace cobbles, well graded, loose, medium brown, moist, homogeneous. [FILL]
3	G	M2			
4					END OF TEST PIT AT 3.5 m (test pit sloughing) Notes: 1. No water observed. 2. Elevation was extracted from DEM

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines
Moisture Content
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: Abacus Mining and Exploration Corporation

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC10-39

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 686713E, 5609617N
Ground Elevation: 921
Datum : NAD83

Excavator : Cat 320DL
Operator : Roland

Start Date : 29 Oct 10
Finish Date : 29 Oct 10
Final Depth of Pit (m) : 3.3
Logged by : MM
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					Grass, rootmat, dark brown, silty topsoil.
					SAND (SW) and GRAVEL Some cobbles, trace silt, well graded, compact, maximum particle size 150 mm, subrounded to subangular, light brown, dry, homogeneous, weak cementation. [TILL]
3					END OF TEST PIT AT 3.3 m (refusal on bedrock?) Notes: 1. No water observed. 2. No samples collected. 3. Elevation was extracted from DEM

Su - kPa: 40, 80, 120, 160

VANE PEAK ◆ REMOLD ◇ FIELD ■ □ LAB ▲ UC/2 △ Pocket Pen /2

★ % Fines

Moisture Content: W_P% × — — — ○ — — — × W_L%; W% 20, 40, 60, 80

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Client: Abacus Mining and Exploration Corporation

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC10-40

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 687298E, 5609544N
Ground Elevation: 881
Datum : NAD83

Excavator : Cat 320DL
Operator : Roland

Start Date : 29 Oct 10
Finish Date : 29 Oct 10
Final Depth of Pit (m) : 5.2
Logged by : MM
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					Grass, rootmat, topsoil.
					SILT (ML) Sandy (fine), trace gravel, low plasticity, compact to dense, medium brown, damp, homogeneous, weak cementation.
1	G	M1			1.0 m - Grain Size Analysis: 19% Gravel, 12% Sand, 61% Silt, 8% Clay.
2					
3					
4					SAND (SW) Fine grained, silty, some gravel, trace cobbles, well graded, compact, maximum particle size 100 mm, subrounded to subangular, medium brown, damp, homogeneous, weak cementation. [TILL]
5					
					END OF TEST PIT AT 5.2 m (maximum reach of excavator)
6					Notes: 1. No water observed. 2. Easy digging with excavator. 3. Elevation was extracted from DEM
7					
8					

Su - kPa
40 80 120 160

	FIELD	LAB	
VANE			▲ UC/2
PEAK	◆	■	
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: Abacus Mining and Exploration Corporation

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC10-41

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 686928E, 5610038N
Ground Elevation: 920
Datum : NAD83

Excavator : Cat 320DL
Operator : Roland

Start Date : 29 Oct 10
Finish Date : 29 Oct 10
Final Depth of Pit (m) : 4.7
Logged by : MM
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					Rootmat, grass, dark brown, topsoil.
					GRAVEL (GW) Medium to coarse, some sand to sandy, some cobbles, some boulders, trace silt, well graded, compact, maximum particle size 300 mm, subrounded to subangular, light brown, dry, homogeneous, no cementation. [TILL]
1					
					SAND (SW) and GRAVEL Fine grained, some cobbles, trace silt, trace boulders, well graded, compact, maximum particle size 300 mm, subrounded to subangular, medium brown, moist, homogeneous, weak cementation. [TILL]
2					
3					
4	G	M1			SAND (SM) Fine grained, silty, poorly graded, compact to dense, brown, moist, homogeneous, moderate cementation. [TILL]
5					END OF TEST PIT AT 4.7 m (maximum reach of excavator) Notes: 1. No water observed. 2. Possible refusal on boulder? 3. Elevation was extracted from DEM
6					
7					
8					

Su - kPa: 40, 80, 120, 160

	FIELD	LAB	
VANE			▲ UC/2
PEAK	◆	■	
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content: W_P% × — ○ W% — × W_L%; 20, 40, 60, 80

○ (4 m)

BGC ENGINEERING INC.
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Client: Abacus Mining and Exploration Corporation

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC10-42

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 687243E, 5610602N
Ground Elevation: 932
Datum : NAD83

Excavator : Cat 320DL
Operator : Roland

Start Date : 30 Oct 10
Finish Date : 30 Oct 10
Final Depth of Pit (m) : 6.3
Logged by : MM
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					Grass, rootmat, dark brown, silty topsoil.
					SILT (ML) Sandy (fine), trace gravel, low plasticity, compact, medium brown, dry, homogeneous, weak cementation.
1	G	M1			SAND (SW) Fine grained, some gravel to gravelly, some silt, trace cobbles, trace boulders, well graded, compact to dense, subangular to subrounded, medium brown, dry, homogeneous, weak cementation. [TILL]
2					
					2.5 m - moist
3					
4					
					SILT (ML) Gravelly, some clay, some sand, trace boulders, some cobbles, low plasticity, dense, grey brown, moist to wet, homogeneous. [TILL]
5					
6	G	M2			
					END OF TEST PIT AT 6.3 m (maximum reach of excavator) Notes: 1. No water observed. 2. Elevation was extracted from DEM
7					
8					

Su - kPa
40 80 120 160
VANE FIELD LAB
PEAK ◆ ■
REMOLD ◇ □
▲ UC/2
△ Pocket Pen /2
★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: Abacus Mining and Exploration Corporation

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC10-43

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 687498E, 5610003N
Ground Elevation: 943
Datum : NAD83

Excavator : Cat 320DL
Operator : Roland

Start Date : 30 Oct 10
Finish Date : 30 Oct 10
Final Depth of Pit (m) : 5.5
Logged by : MM
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					Grass, rootmat, dark brown, silty topsoil, some gravel.
					SAND (SW) Fine grained, gravelly, some cobbles, trace boulders, trace to some silt, well graded, compact to dense, maximum particle size 300 mm, subrounded to subangular, light to medium brown, dry, homogeneous, weak to moderate cementation. [TILL]
3					3.0 m - damp, moderate cementation
5.5					END OF TEST PIT AT 5.5 m (maximum reach of excavator)
					Notes: 1. No water observed. 2. Large boulder at bottom preventing further digging. 3. No samples collected. 4. Elevation was extracted from DEM

Su - kPa: 40, 80, 120, 160

VANE PEAK ◆ ■ REMOLD ◇ □ ▲ UC/2 △ Pocket Pen /2

★ % Fines

Moisture Content: W_P% × — W% ○ — W_L% ×; 20, 40, 60, 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: Abacus Mining and Exploration Corporation

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC10-44

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 687494E, 5610357N
Ground Elevation: 969
Datum : NAD83

Excavator : Cat 320DL
Operator : Roland

Start Date : 30 Oct 10
Finish Date : 30 Oct 10
Final Depth of Pit (m) : 5.6
Logged by : MM
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					Grass, rootmat, dark brown, silty topsoil.
					SAND (SW) and GRAVEL Fine grained, some silt, some clay, some cobbles, trace boulders, well graded, compact to dense, maximum particle size 600 mm, subrounded to subangular, light brown, dry, homogeneous, weak to moderate cementation. [TILL]
1	G	M1			1.1 m - damp to moist. 1.2 m - Grain Size Analysis: 35% Gravel, 28% Sand, 37% Fines.
2					
3					
4					
5					
6					END OF TEST PIT AT 5.6 m (maximum reach of excavator). Notes: 1. No water observed. 2. Possible scrapping on bedrock. 3. Elevation was extracted from DEM
7					
8					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

○ ★

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: Abacus Mining and Exploration Corporation

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC10-45

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 685273E, 5610545N
Ground Elevation: 938
Datum : NAD83

Excavator : Cat 320DL
Operator : Roland

Start Date : 30 Oct 10
Finish Date : 30 Oct 10
Final Depth of Pit (m) : 2.9
Logged by : MM
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					Grass, rootmat, dark brown, silty topsoil.
					SILT (ML) Sandy (fine), trace gravel, low plasticity, compact, light brown, dry, homogeneous, weak cementation.
1	G	M1			
					SAND (SW) Fine grained, gravelly, some silt, some cobbles, well graded, dense, subrounded to subangular, brown, dry, homogeneous, no cementation. [TILL]
2					
			III		MODERATELY WEATHERED BEDROCK Highly fractured, iron stained, R3, greenish grey. [IRON MASK HYBRID]
	G	M2			
3					END OF TEST PIT AT 2.9 m (refusal on bedrock) Notes: 1. No water observed. 2. Elevation was extracted from DEM
4					
5					
6					
7					
8					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

○

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: Abacus Mining and Exploration Corporation

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC10-46

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 684212E, 5610968N
Ground Elevation: 974
Datum : NAD83

Excavator : Cat 320DL
Operator : Noel Johnston

Start Date : 02 Nov 10
Finish Date : 02 Nov 10
Final Depth of Pit (m) : 5.5
Logged by : CJB
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					Grass, topsoil, rootmat, dark brown, roots, dry, some cobbles.
					SAND (SW) and GRAVEL Fine grained, some silt, trace cobbles, well graded, compact, maximum particle size 500 mm, elongated to uniform, rounded to subrounded, brown, dry, trace rootlets. [TILL]
4					4.0 m - damp, subangular.
5	G	M1			5.5 m - Grain Size Analysis: 33% Gravel, 30% Sand, 37% Fines.
					END OF TEST PIT AT 5.5 m (maximum reach of excavator).
					Notes: 1. No water observed. 2. Elevation was extracted from DEM

Su - kPa: 40, 80, 120, 160

VANE PEAK ◆ ■ ▲ UC/2
REMOLD ◇ □ △ Pocket Pen /2

★ % Fines

Moisture Content: W_P% × — — — ○ — — — × W_L%; W% 20, 40, 60, 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: Abacus Mining and Exploration Corporation

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC10-47

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 684321E, 5611183N
Ground Elevation: 969
Datum : NAD83

Excavator : Cat 320DL
Operator : Noel Johnston

Start Date : 02 Nov 10
Finish Date : 02 Nov 10
Final Depth of Pit (m) : 5.6
Logged by : CJB
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					Grass, topsoil, rootmat, dark brown, roots, dry, some subangular gravel.
					SAND (SP) Fine grained, some silt, trace to some gravel, trace cobbles, trace boulders, gab graded, compact to dense, maximum particle size 400 mm, elongated, subangular to subrounded, brown, dry, trace rootlets. [TILL]
1	G	M1			
2					
3					
4					4.0 m - damp, trace to some clay.
5					
	G	M2			
6					END OF TEST PIT AT 5.6 m (maximum reach of excavator). Notes: 1. No water observed. 2. Elevation was extracted from DEM
7					
8					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: Abacus Mining and Exploration Corporation

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC10-48

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 684319E, 5611261N
Ground Elevation: 970
Datum : NAD83

Excavator : Cat 320DL
Operator : Noel Johnston

Start Date : 02 Nov 10
Finish Date : 02 Nov 10
Final Depth of Pit (m) : 5.8
Logged by : CJB
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					Grass, topsoil, rootmat, dark brown, roots, dry, some silt, trace sand, trace subangular gravel.
					SAND (SM) and SILT Fine grained, some gravel, trace to some cobbles, trace boulders, dense, subangular, maximum particle size 400 mm, brown, dry to moist, trace rootlets. [TILL]
1	G	M1			1.5 m - Grain Size Analysis: 25% Gravel, 34% Sand, 41% Fines.
2					
3					
4					4.0 m - some clay, damp
5					
	G	M2			
6					END OF TEST PIT AT 5.8 m (maximum reach of excavator) Notes: 1. No water observed. 2. Elevation was extracted from DEM
7					
8					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
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Client: Abacus Mining and Exploration Corporation

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC10-49

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 684162E, 5611180N
Ground Elevation: 985
Datum : NAD83

Excavator : Cat 320DL
Operator : Noel Johnston

Start Date : 02 Nov 10
Finish Date : 02 Nov 10
Final Depth of Pit (m) : 5.8
Logged by : CJB
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					Grass, topsoil, rootmat, dark brown, roots, dry, silty, some fine sand.
	G	M1			SAND (SM) Fine grained, silty, gravelly, trace boulders, trace cobbles, well graded, compact, maximum particle size 350 mm, subrounded to subangular, brown, dry, trace rootlets. [TILL]
1					
2					
3					
					3.4 m - damp, some cobbles, some clay.
4					
5					
	G	M2			5.8 m - Grain Size Analysis: 36% Gravel, 29% Sand, 35% Fines.
6					END OF TEST PIT AT 5.8 m (maximum reach of excavator)
					Notes: 1. No water observed. 2. Elevation was extracted from DEM
7					
8					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

○ (W%)
○ ★ (5.8 m)

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Client: Abacus Mining and Exploration Corporation

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC10-50

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 683841E, 5611180N
Ground Elevation: 990
Datum : NAD83

Excavator : Cat 320DL
Operator : Noel Johnston

Start Date : 03 Nov 10
Finish Date : 03 Nov 10
Final Depth of Pit (m) : 5.8
Logged by : CJB
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					Grass, topsoil, silty, some sand, trace gravel, rootmat, dark brown, dry.
	G	M1			SAND (SM) and SILT Fine grained, some gravel, trace cobbles, trace boulders, well graded, compact, maximum particle size 400 mm, subrounded to subangular, brown, dry, trace rootlets, trace oxidation. [TILL]
1					
2					
					2.5 m - Dense to very dense, damp, trace clay.
3					
4					
5					
	G	M2			5.8 m - Grain Size Analysis: 27% Gravel, 31% Sand, 42% Fines.
6					END OF TEST PIT AT 5.8 m (maximum reach of excavator)
7					Notes: 1. No water observed. 2. Elevation was extracted from DEM
8					

Su - kPa: 40, 80, 120, 160

	FIELD	LAB	
VANE			▲ UC/2
PEAK	◆	■	
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content: W_P% × — ○ — × W_L%; 20, 40, 60, 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: Abacus Mining and Exploration Corporation

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC10-51

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 683999E, 5611384N
Ground Elevation: 986
Datum : NAD83

Excavator : Cat 320DL
Operator : Noel Johnston

Start Date : 03 Nov 10
Finish Date : 03 Nov 10
Final Depth of Pit (m) : 7.0
Logged by : CJB
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					Grass, topsoil, silty, sandy, trace gravel, rootmat, dark brown, dry.
	G	M1			SILT (ML) and SAND Some boulders, some gravel, trace cobbles, trace boulders, non plastic, loose, maximum particle size 400 mm, subangular to subrounded, brown, dry to damp, trace organics (rootlets), trace olive-colored fine grained sand lenses. [TILL]
2	G	M2			SILT (ML) Some sand, some clay, some subrounded gravel, trace cobbles, trace boulders, low plasticity, compact to dense, maximum particle size 200 mm, brown, no odor, dry to damp, no structure, uncemented. [TILL] 2.1 m - Grain Size Analysis: 20% Gravel, 34% Sand, 29% Silt, 17% Clay.
7	G	M3			END OF TEST PIT AT 7.0 m (maximum reach of excavator)

Notes:
1. No water observed.
2. Elevation was extracted from DEM

Su - kPa: 40, 80, 120, 160

VANE PEAK ◆ ■ ▲ UC/2
REMOLD ◇ □ △ Pocket Pen /2

★ % Fines

Moisture Content
W_P% × — — — ○ — — — × W_L%
20, 40, 60, 80

○ ○ ○ ★

BGC ENGINEERING INC.
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Client: Abacus Mining and Exploration Corporation

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC10-52

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 684160E, 5611380N
Ground Elevation: 987
Datum : NAD83

Excavator : Cat 320DL
Operator : Noel Johnston

Start Date : 03 Nov 10
Finish Date : 03 Nov 10
Final Depth of Pit (m) : 5.8
Logged by : CJB
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					Grass, topsoil, rootmat, dark brown, silty, sandy, trace gravel, trace cobbles, rootlets, dry.
	G	M1			SAND (SW) Silty, some gravel, some clay, trace cobbles, trace boulders, dense, maximum particle size 300 mm, subrounded clasts, brown, dry, white staining. [TILL] 0.6 m - Grain Size Analysis: 22% Gravel, 35% Sand, Fines 30% Silt, 13% Clay
1					
2					2.0 m - dense to very dense (very difficult to excavate), trace clay.
3					
4					
5					
	G	M2			5.8 m - Grain Size Analysis: 28% Gravel, 31% Sand, Fines 25% Silt, 16% Clay
6					END OF TEST PIT AT 5.8 m (maximum reach of excavator)
					Notes: 1. No water observed. 2. Elevation was extracted from DEM
7					
8					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

○ ★ ★

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: Abacus Mining and Exploration Corporation

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC10-53

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 684320E, 5611580N
Ground Elevation: 972
Datum : NAD83

Excavator : Cat 320DL
Operator : Noel Johnston

Start Date : 03 Nov 10
Finish Date : 03 Nov 10
Final Depth of Pit (m) : 5.0
Logged by : CJB
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					Topsoil, silty, fine sand, trace gravel, dark brown, dry, no odor, no structure, rootlets
	G	M1			SAND (SP) and GRAVEL Fine grained, some cobbles, some boulders, poorly graded, compact, subrounded to subangular, brown with white alkali staining, dry, trace rootlets. [TILL]
3					3.0 m - compact to dense, significant coarse fraction up to 2.0 m diameter.
5	G	M2			END OF TEST PIT AT 5.0 m Notes: 1. No water observed. 2. Elevation was extracted from DEM

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

○

BGC ENGINEERING INC.
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Client: Abacus Mining and Exploration Corporation

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC10-54

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 684159E, 5611591N
Ground Elevation: 984
Datum : NAD83

Excavator : Cat 320DL
Operator : Noel Johnston

Start Date : 04 Nov 10
Finish Date : 04 Nov 10
Final Depth of Pit (m) : 6.2
Logged by : CJB
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					Topsoil, silty, sandy, some cobbles, trace gravel, dark brown, dry, rootlets.
1	G	M1			SAND (SM) and GRAVEL Fine grained, silty, trace cobbles, trace boulders, well graded, compact, maximum particle size 500 mm, subrounded to subangular, brown, dry, trace rootlets. [TILL]
2					
3					3.0 m - trace to some clay.
4					4.0 m - damp.
5					
6	G	M2			6.2 m - Grain Size Analysis: 27% Gravel, 38% Sand, 35% Fines.
7					END OF TEST PIT AT 6.2 m (maximum reach of excavator). Notes: 1. No water observed. 2. Total Sulphate Ion Content: M1 = 0.03%, M2 = 0.05% 3. Elevation was extracted from DEM
8					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

○ (M1)
○ ★ (M2)

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Client: Abacus Mining and Exploration Corporation

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC10-55

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 683998E, 5611583N
Ground Elevation: 990
Datum : NAD83

Excavator : Cat 320DL
Operator : Noel Johnston

Start Date : 04 Nov 10
Finish Date : 04 Nov 10
Final Depth of Pit (m) : 6.4
Logged by : CJB
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					Topsoil, silty, sandy, dark brown, dry, no structure, no cementation, rootlets
	G	M1			SAND (SM) Fine grained, silty, some gravel, some clay, trace cobbles, trace boulders, well graded, compact, subrounded to subangular, brown, dry, rootlets, trace oxidation, trace white staining. [TILL]
4.5					4.5 m - trace to some clay, damp
6	G	M2			6.4 m - Grain Size Analysis: 18% Gravel, 35% Sand, 47% Fines.
					END OF TEST PIT AT 6.4 m (maximum reach of excavator).

Notes:
1. No water observed.
2. Total Sulphate Ion Content: M2 = 0.07%
3. Elevation was extracted from DEM

Su - kPa: 40, 80, 120, 160

VANE PEAK ◆ ■ ▲ UC/2
REMOLD ◇ □ △ Pocket Pen /2

★ % Fines

Moisture Content: W_P% × — ○ — × W_L%; W% 20, 40, 60, 80

BGC ENGINEERING INC.
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Client: Abacus Mining and Exploration Corporation

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC10-56

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 683840E, 5611578N
Ground Elevation: 987
Datum : NAD83

Excavator : Cat 320DL
Operator : Noel Johnston

Start Date : 04 Nov 10
Finish Date : 04 Nov 10
Final Depth of Pit (m) : 5.0
Logged by : CJB
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					Topsoil, dark brown, dry, no odor, rootlets, no structure.
	G	M1			SAND (SP) Fine grained, some silt, some gravel, some clay, trace cobbles, trace boulders, compact to dense, maximum particle size 500 mm, subangular to subrounded, brown, dry, rootlets, white staining. [TILL]
1					
					1.5 m - Color changes to olive-brown, very dense.
2					
3					
4					
	G	M2			5.0 m - Grain Size Analysis: 17% Gravel, 37% Sand, 46% Fines.
5					END OF TEST PIT AT 5.0 m (maximum reach of excavator).
					Notes: 1. No water observed 2. Elevation was extracted from DEM
6					
7					
8					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

○ ★

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: Abacus Mining and Exploration Corporation

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC10-57

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 683838E, 5611786N
Ground Elevation: 966
Datum : NAD83

Excavator : Cat 320DL
Operator : Noel Johnston

Start Date : 04 Nov 10
Finish Date : 04 Nov 10
Final Depth of Pit (m) : 6.0
Logged by : CJB
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					Topsoil, silty, sandy, rootlets, dry, dark brown, no odor, no structure.
					SAND (SM) and GRAVEL Fine grained, silty, trace cobbles, trace boulders, well graded, subangular to subrounded, maximum particle size 500 mm, brown, dry, rootlets. [TILL]
1	G	M1			0.9 m - Grain Size Analysis: 34% Gravel, 31% Sand, 35% Fines.
2					
3					3.0 - 4.0 m: Zone of angular coarse grained material
4					
5					5.0 - 6.0 m: Zone of angular coarse grained material
6	G	M2			END OF TEST PIT AT 6.0 m (maximum reach of excavator). Notes: 1. No water observed. 2. Elevation was extracted from DEM
7					
8					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
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Client: Abacus Mining and Exploration Corporation

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC10-58

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 684002E, 5611780N
Ground Elevation: 976
Datum : NAD83

Excavator : Cat 320DL
Operator : Noel Johnston

Start Date : 04 Nov 10
Finish Date : 04 Nov 10
Final Depth of Pit (m) : 5.9
Logged by : CJB
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					Topsoil, silty, sandy, dark brown, dry, no structure, no cementation, rootlets
1	G	M1			SAND (SM) Fine grained, silty, some clay, some gravel, trace cobbles, trace boulders, dense, maximum particle size 500 mm, subangular to subrounded, brown with white staining, dry, rootlets. [TILL] 0.7 m - Grain Size Analysis: 10% Gravel, 42% Sand, 48% Fines.
2					
3					
4					4.0 m - Trace to some clay, slightly damp.
5					
6	G	M2			END OF TEST PIT AT 5.9 m (maximum reach of excavator). Notes: 1. No water observed. 2. Total Sulphate Ion Content: M2 = 0.02% 3. Elevation was extracted from DEM
7					
8					

Su - kPa: 40, 80, 120, 160

VANE PEAK ◆ REMOLD ◇ FIELD ■ □ LAB ▲ UC/2 △ Pocket Pen /2

★ % Fines

Moisture Content: W_P% × — ○ — W% — × W_L%; 20, 40, 60, 80

○ ★ ○

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: Abacus Mining and Exploration Corporation

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC10-59

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 684220E, 5611705N
Ground Elevation: 975
Datum : NAD83

Excavator : Cat 320DL
Operator : Roland

Start Date : 05 Nov 10
Finish Date : 05 Nov 10
Final Depth of Pit (m) : 6.1
Logged by : CJB
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					Topsoil, silty, sandy, dark brown, no odor, dry, no structure, rootlets.
	G	M1			SAND (SM) Fine grained, silty, gravelly, trace cobbles, trace boulders, well graded, compact to dense, maximum particle size 500 mm, subrounded to subangular, brown, dry, rootlets. [TILL]
5					5.0 m - dense to very dense
6	G	M2			6.1 m - Grain Size Analysis: 42% Gravel, 33% Sand, 25% Fines.
					END OF TEST PIT AT 6.1 m (maximum reach of excavator).

Notes:
1. No water observed
2. Elevation was extracted from DEM

Su - kPa: 40, 80, 120, 160

VANE PEAK ◆ ■ ▲ UC/2
REMOLD ◇ □ △ Pocket Pen /2

★ % Fines

Moisture Content: W_P% × — W% ○ — W_L% ×; 20, 40, 60, 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: Abacus Mining and Exploration Corporation

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC10-60

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 684320E, 5611780N
Ground Elevation: 984
Datum : NAD83

Excavator : Cat 320DL
Operator : Roland

Start Date : 05 Nov 10
Finish Date : 05 Nov 10
Final Depth of Pit (m) : 5.0
Logged by : CJB
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					Topsoil, silty, sandy, dark brown, dry, rootlets.
1	G	M1			SAND (SM) Fine grained, silty, trace to some gravel, trace cobbles, trace boulders, well graded, dense to very dense, maximum particle size 500 mm, subangular to subrounded, brown, dry, rootlets. [TILL]
5	G	M2			5.0 m - Grain Size Analysis: 28% Gravel, 32% Sand, 40% Fines. END OF TEST PIT AT 5.0 m (maximum reach of excavator). Notes: 1. No water observed. 2. Elevation was extracted from DEM

Su - kPa: 40, 80, 120, 160
VANE PEAK ▲ UC/2
FIELD ◆ LAB ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines
Moisture Content: W_P% × — W% ○ — W_L% ×; 20, 40, 60, 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: Abacus Mining and Exploration Corporation

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC10-61

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 684261E, 5610421N
Ground Elevation: 979
Datum : NAD83

Excavator : Cat 320DL
Operator : Roland

Start Date : 05 Nov 10
Finish Date : 05 Nov 10
Final Depth of Pit (m) : 6.0
Logged by : CJB
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					Topsoil, trace amounts of topsoil and vegetation on surface of stockpile. Silty, sandy, roots, and rootlets. [TOP SOIL]
1	G	M1			GRAVEL (GW) Some silt, some sand, some cobbles, some boulders, well graded, very dense, maximum particle size 1100 mm, angular to subangular, brown, dry, trace organics. Very difficult digging due to density and oversize material. [FILL] 0.7 m - Grain Size Analysis: 75% Gravel, 12% Sand, 13% Fines.
2					
3					
4					Gravel (GW) Silty, some sand, cobbley, some boulders, well graded, very dense, maximum particle size 1100 mm, angular, brown, dry. [FILL]
5					
6	G	M2			END OF TEST PIT AT 6.0 m (maximum reach of excavator). Notes: 1. No water observed. 2. Elevation was extracted from DEM
7					
8					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: Abacus Mining and Exploration Corporation

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC10-62

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 684202E, 5610399N
Ground Elevation: 977
Datum : NAD83

Excavator : Cat 320DL
Operator : Roland

Start Date : 05 Nov 10
Finish Date : 05 Nov 10
Final Depth of Pit (m) : 4.5
Logged by : CJB
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					Topsoil, trace amounts of topsoil and vegetation on surface of stockpile.
	G	M1			SILT (ML) and GRAVEL Some sand, some cobbles, some boulders, loose to compact, maximum particle size 500 mm, subrounded, brown, dry, trace organics. [FILL]
3					GRAVEL (GW) Cobbley, silty, some boulders, very dense, maximum particle size 500 mm, angular, brown, dry [FILL]
4	G	M2			END OF TEST PIT AT 4.5 m
					Notes: 1. No water observed. 2. Total Sulphate Ion Content: M1 = 0.01%, M2 = 0.47% 3. Elevation was extracted from DEM
8					

Su - kPa: 40, 80, 120, 160

VANE PEAK ◆ ■ ▲ UC/2
REMOLD ◇ □ △ Pocket Pen /2

★ % Fines

Moisture Content
W_P% × — — — ○ — — — × W_L%
20, 40, 60, 80

BGC ENGINEERING INC.
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Client: Abacus Mining and Exploration Corporation

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC10-63

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 684119E, 5610406N
Ground Elevation: 968
Datum : NAD83

Excavator : Cat 320DL
Operator : Roland

Start Date : 06 Nov 10
Finish Date : 06 Nov 10
Final Depth of Pit (m) : 5.0
Logged by : CJB
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					Topsoil and organics, silty, some gravel, rootlets, brown, no odor, dry.
	G	M1			GRAVEL (GP) and COBBLES Some silt, some sand, trace boulders, well graded, loose, maximum particle size 300 mm, angular, brown-grey, dry, trace rootlets. [FILL]
4					SILT (ML) Gravelly, some sand, some cobbles, trace boulders, dense to very dense, maximum particle size 500 mm, brown, no odor, dry to damp, no structure, no cementation. [FILL]
5	G	M2			5.0 m - Grain Size Analysis: 31% Gravel, 27% Sand, 42% Fines.
					END OF TEST PIT AT 5.0 m (very difficult digging)

Notes:
1. No water observed.
2. Test pit located at edge of second bench of stockpile.
3. Elevation was extracted from DEM

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: Abacus Mining and Exploration Corporation

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC10-64

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 684119E, 5610281N
Ground Elevation: 973
Datum : NAD83

Excavator : Cat 320DL
Operator : Roland

Start Date : 06 Nov 10
Finish Date : 06 Nov 10
Final Depth of Pit (m) : 5.0
Logged by : CJB
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					Topsoil and organics, silty, some gravel, rootlets, brown, no odor, dry.
	G	M1			BOULDERS and COBBLES Some silt, some sand, some gravel, well graded, maximum particle size 1.0 m, angular, brownish grey, dry, trace rootlets. [FILL]
5	G	M2			END OF TEST PIT AT 5.0 m (sloughing of coarse material from sidewalls). Notes: 1. No water observed. 2. Testpit located at edge of second bench of stockpile. 3. Elevation was extracted from DEM

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines
Moisture Content
W_P% W% W_L%
20 40 60 80

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Client: Abacus Mining and Exploration Corporation

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC10-65

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 684047E, 5610202N
Ground Elevation: 968
Datum : NAD83

Excavator : Cat 320DL
Operator : Roland

Start Date : 06 Nov 10
Finish Date : 06 Nov 10
Final Depth of Pit (m) : 3.3
Logged by : CJB
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					Topsoil, silty, sandy, trace rootlets, brown, no odor, dry to damp.
	G	M1			BOULDERS and COBBLES Trace to some silt, trace to some gravel, trace clay, well graded, maximum particle size of 1.0 m, angular, brownish grey, dry, trace rootlets. [FILL]
1					Some TILL interspersed with rockfill.
2					
3	G	M2			
					END OF TEST PIT AT 3.3 m
4					Notes: 1. No water observed. 2. Elevation was extracted from DEM
5					
6					
7					
8					

Su - kPa
40 80 120 160
VANE FIELD LAB
PEAK ◆ ■
REMOLD ◇ □
▲ UC/2
△ Pocket Pen /2
★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

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Client: Abacus Mining and Exploration Corporation

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC10-66

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 684112E, 5610142N
Ground Elevation: 979
Datum : NAD83

Excavator : Cat 320DL
Operator : Roland

Start Date : 06 Nov 10
Finish Date : 06 Nov 10
Final Depth of Pit (m) : 4.2
Logged by : CJB
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					Topsoil, silty, sandy, trace gravel, organics, brown, dry.
1	G	M1			SAND (SM) Fine grained, silty, trace to some gravel, trace cobbles, trace boulders, well graded, compact, maximum particle size 500 mm, subangular to subrounded, brown, dry. [TILL]
2					
3					3.2 m - Very dense (very difficult to excavate).
4	G	M2			
					END OF TEST PIT AT 4.2 m (Refusal. Bedrock?) Notes: 1. No water observed. 2. Elevation was extracted from DEM
5					
6					
7					
8					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines
Moisture Content
W_P% W% W_L%
20 40 60 80

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: Abacus Mining and Exploration Corporation

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC10-67

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 684241E, 5610490N
Ground Elevation: 970
Datum : NAD83

Excavator : Cat 320DL
Operator : Roland

Start Date : 06 Nov 10
Finish Date : 06 Nov 10
Final Depth of Pit (m) : 4.5
Logged by : CJB
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					Topsoil, silty, sandy, dark brown, dry, rootlets/organics.
					SAND (SM) and GRAVEL Fine grained, silty, some cobbles, trace boulders, well graded, subrounded to subangular, brown, dry, rootlets. [FILL]
1	G	M1			1.0 m - Grain Size Analysis: 39% Gravel, 31% Sand, 30% Fines.
					BOULDERS and COBBLES Gravelly, trace silt, poorly graded (mostly coarse grained), angular, brownish grey, dry, rootlets. [ROCKFILL - SUGARLOAF DIORITE]
2					
3					
4					
	G	M2			
					END OF TEST PIT AT 4.5 m
5					Notes: 1. No water observed. 2. Test pit located on slope of bottom bench of stockpile. 3. Test pit sloughing 4. Elevation was extracted from DEM
6					
7					
8					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines
Moisture Content
W_P% W% W_L%
20 40 60 80

○ ★

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: Abacus Mining and Exploration Corporation

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC10-68

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 684322E, 5610489N
Ground Elevation: 980
Datum : NAD83

Excavator : Cat 320DL
Operator : Roland

Start Date : 06 Nov 10
Finish Date : 06 Nov 10
Final Depth of Pit (m) : 4.0
Logged by : CJB
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					Topsoil, silty, sandy, brown, dry, rootlets/organics.
	G	M1			SAND (SM) Fine grained, silty, some gravel, trace cobbles, trace boulders, well graded, dense to very dense, maximum particle size 350 mm, subrounded to subangular, brown, dry, trace rootlets. [FILL] 0.4 m - Grain Size Analysis: 49% Gravel, 31% Sand, 20% Fines.
1					
2					
3					
4	G	M2			END OF TEST PIT AT 4.0 m Notes: 1. No water observed 2. Below 4.0 m; COBBLES and BOULDERS 3. Elevation was extracted from DEM
5					
6					
7					
8					

Su - kPa
40 80 120 160
VANE FIELD LAB
PEAK ◆ ■
REMOLD ◇ □
▲ UC/2
△ Pocket Pen /2
★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: Abacus Mining and Exploration Corporation

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC10-69

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 684186E, 5610465N
Ground Elevation: 960
Datum : NAD83

Excavator : Cat 320DL
Operator : Noel Johnston

Start Date : 07 Nov 10
Finish Date : 07 Nov 10
Final Depth of Pit (m) : 2.0
Logged by : CJB
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					Topsoil, silty, sandy, dark brown, no odor, dry, organics.
1	G	M1			SAND (SM) Fine grained, silty, some gravel, trace cobbles, trace boulders,well graded, compact, maximum particle size 250 mm, subrounded to subangular, brown, dry, trace rootlets. [TILL] 1.0 m - some cobbles
2	G	M2	II		SLIGHTLY WEATHERED BEDROCK Weak to medium strong, green with surface oxidation and white staining, fractured orthoganally, fracture spacing <100 mm, dry. [IRON MASK HYBRID]
					END OF TEST PIT AT 2.0 m (refusal on bedrock)
3					Notes: 1. No water observed. 2. Test pit excavated at toe of bottom bench of stockpile. 3. Outcrop located nearby at 0684175, 5610453 4. Elevation was extracted from DEM
4					
5					
6					
7					
8					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

○

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Client: Abacus Mining and Exploration Corporation

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC10-70

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 684293E, 5610606N
Ground Elevation: 957
Datum : NAD83

Excavator : Cat 320DL
Operator : Noel Johnston

Start Date : 07 Nov 10
Finish Date : 07 Nov 10
Final Depth of Pit (m) : 3.5
Logged by : CJB
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					Topsoil, silty, sandy, dark brown, dry, rootlets.
1	G	M1			SAND (SM) Fine grained, silty, trace to some gravel, trace cobbles, trace boulders, well graded, dense to very dense, maximum particle size 800 mm, subangular to subrounded, brown, dry, trace rootlets. [TILL]
2					2.0 m - some cobbles, trace to some boulders.
3	G	M2			
4					END OF TEST PIT AT 3.5 m (refusal of excavator on bedrock - iron mask hybrid) Notes: 1. No water encountered. 2. Test pit excavated at toe of bottom bench of stockpile. 3. Elevation was extracted from DEM
5					
6					
7					
8					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines
Moisture Content
W_P% W% W_L%
20 40 60 80

○

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: Abacus Mining and Exploration Corporation

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC10-71

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 686144E, 5608286N
Ground Elevation: 974
Datum : NAD83

Excavator : Cat 320DL
Operator : Roland

Start Date : 14 Dec 10
Finish Date : 14 Dec 10
Final Depth of Pit (m) : 2.7
Logged by : AKU
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					Topsoil, rootmat, grass, dark brown, silt, rootlets.
1	G	M1			SAND (SM) Fine grained, silty, some cobbles, some gravel, subrounded, low to non plastic, weak cementation, light brown, very damp [TILL] 1.2 m - cobbley (~200 mm), gravelly, moderate cementation, dense.
2	G	M2			
3					END OF TEST PIT AT 2.7 m (refusal on bedrock) Notes: 1. No water observed. 2. Bedrock is slightly weathered, (R3), light greyish green. 3. Elevation was extracted from DEM
4					
5					
6					
7					
8					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: Abacus Mining and Exploration Corporation

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC10-72

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 686142E, 5608085N
Ground Elevation: 992
Datum : NAD83

Excavator : Cat 320DL
Operator : Roland

Start Date : 15 Dec 10
Finish Date : 15 Dec 10
Final Depth of Pit (m) : 5.0
Logged by : AKU
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					Grass, rootmat, topsoil, silt with some sand, brown, trace gravel.
					GRAVEL (GP) and SAND and COBBLES Some silt, dense, damp, weak cementation, subrounded, max particle size 250 mm. [TILL]
1	G	M1			
2	G	M2			SAND (SM) and SILT Fine grained, gravelly, some cobbles, well graded, moderately cemented, subrounded to subangular, dense. [TILL]
3					
4					
5					END OF TEST PIT AT 5.0 m (maximum reach of excavator) Notes: 1. No water observed. 2. Elevation was extracted from DEM
6					
7					
8					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines
Moisture Content
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
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Client: Abacus Mining and Exploration Corporation

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC10-73

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 686441E, 5608094N
Ground Elevation: 991
Datum : NAD83

Excavator : Cat 320DL
Operator : Roland

Start Date : 14 Dec 10
Finish Date : 14 Dec 10
Final Depth of Pit (m) : 5.0
Logged by : AKU
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					Topsoil, grass, rootmat
					SAND (SM) Fine grained, silty, some gravel, some cobbles, trace boulders, subangular to subrounded, dense, weak to moderate cementation, maximum particle size 400 mm, brown, dry, calcite present. [TILL]
2					2.0 m - weak cementation, moist, no calcite.
5					END OF TEST PIT AT 5.0 m (maximum reach of excavator) Notes: 1. No water observed. 2. No samples collected. 3. Elevation was extracted from DEM
8					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines
Moisture Content
W_P% W% W_L%
20 40 60 80

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AN APPLIED EARTH SCIENCES COMPANY

Client: Abacus Mining and Exploration Corporation

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC10-74

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 686439E, 5608284N
Ground Elevation: 971
Datum : NAD83

Excavator : Cat 320DL
Operator : Roland

Start Date : 14 Dec 10
Finish Date : 14 Dec 10
Final Depth of Pit (m) : 2.5
Logged by : AKU
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					Grass, rootmat, topsoil, brown, silty
					SAND (SM) and SILT Fine grained, some gravel, some cobbles, loose to compact, subrounded, weak to no cementation, light brown. [TILL]
2			II		SLIGHTLY WEATHERED BEDROCK Light greyish green, R3.
					END OF TEST PIT AT 2.5 m (refusal on bedrock)
3					Notes: 1. No water observed. 2. No samples collected. 3. Elevation was extracted from DEM

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines
Moisture Content
W_P% W% W_L%
20 40 60 80

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: Abacus Mining and Exploration Corporation

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC10-75

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 686308E, 5608181N
Ground Elevation: 991
Datum : NAD83

Excavator : Cat 320DL
Operator : Roland

Start Date : 14 Dec 10
Finish Date : 14 Dec 10
Final Depth of Pit (m) : 4.2
Logged by : AKU
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					Grass, rootmat, topsoil.
1	G	M1			COBBLES and SAND and GRAVEL Trace to some boulders, dense, moderately cemented, subrounded, light brown, damp. [TILL]
2					
3					2.5 m - very dense, boulders >1.0 m
4					
5					END OF TEST PIT AT 4.2 m (refusal on till) Notes: 1. No water observed. 2. Elevation was extracted from DEM
6					
7					
8					

Su - kPa

40 80 120 160

VANE	FIELD	LAB	
PEAK	◆	■	▲ UC/2
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content

W_P% W% W_L%

20 40 60 80

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: Abacus Mining and Exploration Corporation

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC10-76

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 683890E, 5612145N
Ground Elevation: 970
Datum : NAD83

Excavator : Cat 320DL
Operator : Roland

Start Date : 15 Dec 10
Finish Date : 15 Dec 10
Final Depth of Pit (m) : 1.2
Logged by : AKU
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					Topsoil, rootmat, grass.
					SAND (SP) and GRAVEL and COBBLES Fine grained, compact to dense, weak to moderate cementation subangular to subrounded, brown, damp, calcite. [TILL]
1					MODERATELY WEATHERED BEDROCK Light greyish green, R3.
					END OF TEST PIT AT 1.2 m (refusal on bedrock)
2					Notes: 1. No water observed. 2. No samples collected. 3. Elevation was extracted from DEM
3					
4					
5					
6					
7					
8					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines
Moisture Content
W_P% W% W_L%
20 40 60 80

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: Abacus Mining and Exploration Corporation

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC10-77

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 683507E, 5612518N
Ground Elevation: 959
Datum : NAD83

Excavator : Cat 320DL
Operator : Roland

Start Date : 15 Dec 10
Finish Date : 15 Dec 10
Final Depth of Pit (m) : 2.7
Logged by : AKU
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					Rootmat, grass, topsoil, roots, fine sand and silt, damp, brown, trace gravel, loose.
1					SAND (SP) and GRAVEL Fine grained, some cobbles, some silt to silty, trace boulders, loose to compact, subangular to subrounded, damp, weak to moderate cementation. [TILL] 1.2 m - compact
2	G	M1			2.0 m - compact to dense, cobbley
3					END OF TEST PIT AT 2.7 m (refusal on bedrock) Notes: 1. No water observed. 2. Elevation was extracted from DEM
4					
5					
6					
7					
8					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines
Moisture Content
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: Abacus Mining and Exploration Corporation

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC11-78

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 681838E, 5611066N
Ground Elevation: 950
Datum : NAD83

Excavator : Cat320DL
Operator : Roland

Start Date : 04 Jan 11
Finish Date : 04 Jan 11
Final Depth of Pit (m) : 5.0
Logged by : AR
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					SILT (ML) Some sand, some gravel, low plasticity, compact, brown, organic odour, dry to moist, no structure, no cementation, some roots. [TOPSOIL]
1					SILT (ML) Sandy, some gravel to gravelly, low plasticity, dense to very dense, brown, no odour, moist, no structure, weak cementation. [TILL]
2					
3					SAND (SM) Fine grained, silty, gravelly, some small boulders, well graded, compact to dense, maximum particle size = 450 mm, sub rounded, brown, no odour, moist, homogeneous, moderate cementation. [TILL] 3.50 m - moisture level changes to moist.
4					
5					END OF TEST PIT AT 5.0 m (refusal due to large boulder) Notes: 1. No water observed 2. No samples collected 3. Elevation was extracted from DEM
6					
7					
8					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines
Moisture Content
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: Abacus Mining and Exploration Corporation

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC11-79

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 681618E, 5612343N
Ground Elevation: 906
Datum : NAD83

Excavator : Cat320DL
Operator : Roland

Start Date : 04 Jan 11
Finish Date : 04 Jan 11
Final Depth of Pit (m) : 5.0
Logged by : AR
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					SILT (ML) Some fine sand, trace gravel, low plasticity, loose to compact, brown, organic odour, dry to moist, no structure, no cementation, some roots. [TOPSOIL]
1					SILT (ML) Some fine sand, trace to some clay, low plasticity, loose to compact, light brown, no odour, dry to moist, no structure, weak cementation. [TILL]
2					SAND (SM) Fine to medium grained, silty, dense to very dense, subrounded, brown, no odour, moist, homogeneous, moderate cementation. [TILL]
3					
4					
5					END OF TEST PIT AT 5.0 m (maximum reach of excavator) Notes: 1. No water observed in test pit. 2. Very hard digging at bottom of pit. 3. No samples collected 4. Elevation was extracted from DEM
6					
7					
8					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: Abacus Mining and Exploration Corporation

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC11-80

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 681173E, 5612266N
Ground Elevation: 878
Datum : NAD83

Excavator : Cat320DL
Operator : Garry Grant

Start Date : 05 Jan 11
Finish Date : 05 Jan 11
Final Depth of Pit (m) : 5.0
Logged by : AR
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					Organic silt. [TOPSOIL]
1	G	M1			SAND (SM) Fine to medium grained, silty, gravelly, some small boulders, well graded, compact, maximum particle size = 200 mm, subrounded, brown, no odour, dry to moist, no structure, weak cementation.
2					
3					
4					
5	G	M2			END OF TEST PIT AT 5.0 m (maximum reach of excavator) Notes: 1. Sand and gravel content increased with depth. 2. Difficulty digging at bottom of pit. 3. No water observed 4. Elevation was extracted from DEM
6					
7					
8					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines
Moisture Content
W_P% W% W_L%
20 40 60 80

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: Abacus Mining and Exploration Corporation

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC11-81

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 680910E, 5613026N
Ground Elevation: 925
Datum : NAD83

Excavator : Cat320DL
Operator : Garry Grant

Start Date : 05 Jan 11
Finish Date : 05 Jan 11
Final Depth of Pit (m) : 5.0
Logged by : AR
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					SILT (ML) Trace clay, trace sand, trace gravel, low plasticity, compact, brown, organic odour, dry to moist, no structure, no cementation, some roots. [TOPSOIL]
1	G	M1			SAND (SW) Gravelly, some silt, well graded, compact, subrounded, dry to moist, homogeneous, no to weak cementation. [TILL]
2					
3	G	M2			3.0 m - Consistency changes to sand and gravel.
4	G	M3			
5					END OF TEST PIT AT 5.0 m (maximum reach of excavator) Notes: 1. No water observed. 2. Elevation was extracted from DEM
6					
7					
8					

Su - kPa
40 80 120 160
VANE FIELD LAB
PEAK ◆ ■
REMOLD ◇ □
▲ UC/2
△ Pocket Pen /2
★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: Abacus Mining and Exploration Corporation

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC11-82

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 681458E, 5613046N
Ground Elevation: 917
Datum : NAD83

Excavator : Cat320DL
Operator : Garry Grant

Start Date : 05 Jan 11
Finish Date : 05 Jan 11
Final Depth of Pit (m) : 2.3
Logged by : AR
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					SILT (ML) Some fine sand, trace gravel, non plastic, brown, organic odour, dry to moist, no structure, no cementation, some roots. [TOPSOIL]
1	G	M1			SAND (SW) Fine to medium grained, gravelly, some silt, well graded, compact, maximum particle size = 400 mm, brown, no odour, dry to moist, homogeneous, no to weak cementation. [TILL]
2	G	M2			2.0 m - gravel content increases, ground is compact to dense, slower digging.
					END OF TEST PIT AT 2.3 m (refusal on bedrock) Notes: 1. No water observed. 2. Elevation was extracted from DEM
3					
4					
5					
6					
7					
8					

Su - kPa

40 80 120 160

VANE	FIELD	LAB	
PEAK	◆	■	▲ UC/2
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content

W_P% W% W_L%

20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: Abacus Mining and Exploration Corporation

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC11-83

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 682797E, 5612656N
Ground Elevation: 959
Datum : NAD83

Excavator : Cat320DL
Operator : Garry Grant

Start Date : 05 Jan 11
Finish Date : 05 Jan 11
Final Depth of Pit (m) : 5.0
Logged by : AR
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					SILT (ML) Some sand, trace gravel, non plastic, compact, brown, organic, moist, no structure, no cementation, some roots. [TOPSOIL]
1	G	M1			SAND (SM) Fine to medium grained, silty, some gravel, well graded, maximum particle size = 150 mm, subrounded, brown, no odour, dry to moist, homogeneous, weak to no cementation. [TILL]
	G	M2			CLAY (CI) Some silt, some gravel, intermediate plasticity, very stiff to hard, brown, no odour, moist, no structure, moderate cementation.
2					
3	G	M3			GRAVEL (GC) and CLAY Some silt, intermediate to low plasticity, compact to dense, brown, no odour, moist, no structure, moderately cemented. [TILL]
4					
5					END OF TEST PIT AT 5.0 m (maximum reach of excavator) Notes: 1. No water observed. 2. Elevation was extracted from DEM
6					
7					
8					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines
Moisture Content
W_P% W% W_L%
20 40 60 80

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: Abacus Mining and Exploration Corporation

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC11-84

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 683369E, 5612548N
Ground Elevation: 965
Datum : NAD83

Excavator : Cat320DL
Operator : Garry Grant

Start Date : 06 Jan 11
Finish Date : 06 Jan 11
Final Depth of Pit (m) : 5.5
Logged by : AR
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					SILT (ML) Some fine sand, some gravel, non plastic, compact, brown, organic odour, moist, no structure, weak cementation, some roots.
1	G	M1			SAND (SW) and GRAVEL Some silt, trace cobbles, trace boulders, well graded, dense, maximum particle size = 250 mm, subrounded, brown, no odour, dry to moist, homogeneous, no to weak cementation.
2					
3					
4					
5	G	M2			SILT (ML) Gravelly, clayey, trace fine sand, low plasticity, dense to very dense, brown, no odour, moist, no structure, moderately cemented.
6					END OF TEST PIT AT 5.5 m (maximum reach of excavator) Notes: 1. No water was observed 2. Elevation was extracted from DEM
7					
8					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: Abacus Mining and Exploration Corporation

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC11-85

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 682667E, 5612312N
Ground Elevation: 984
Datum : NAD83

Excavator : Cat320DL
Operator : Garry Grant

Start Date : 06 Jan 11
Finish Date : 06 Jan 11
Final Depth of Pit (m) : 5.5
Logged by : AR
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					SILT (ML) Trace clay, trace sand, trace gravel, non plastic, compact, brown, organic odour, moist, no structure, no cementation, some roots. [TOPSOIL]
1	G	M1			SAND (SM) Fine to medium grained, silty, gravelly, well graded, compact to dense, maximum particle size = 300 mm, subrounded, brown, no odour, moist to dry, homogeneous, weak cementation. [TILL]
2					
3	G	M2			SILT (ML) Gravelly, some clay, some fine sand, low plasticity, moderately to well graded, stiff, dense, maximum particle size = 300 mm, brown, no odour, moist, no structure, moderate cementation. [TILL]
4					SILT (ML) Gravelly, clayey, some fine to medium grained sand, some cobbles and boulders, maximum particle = 450 mm, low plastcity, dense, brown, no odour, moist, no structure, moderate cementation. [TILL]
5					
6					END OF TEST PIT AT 5.5 m (maximum reach of excavator) Notes: 1. No water observed 2. Elevation was extracted from DEM
7					
8					

Su - kPa
40 80 120 160
VANE FIELD LAB
PEAK ◆ ■
REMOLD ◇ □
▲ UC/2
△ Pocket Pen /2
★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: Abacus Mining and Exploration Corporation

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC11-86

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 680253E, 5612927N
Ground Elevation: 907
Datum : NAD83

Excavator : Cat320DL
Operator : Garry Grant

Start Date : 06 Jan 11
Finish Date : 06 Jan 11
Final Depth of Pit (m) : 5.0
Logged by : AR
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					SILT (ML) Some fine sand, some gravel, non plastic, loose to compact, brown, organic odour, moist, no structure, no cementation, some roots. [TOPSOIL]
1	G	M1			SAND (SM) Fine to medium grained, silty, gravelly, well graded, compact, maximum particle size = 250 mm, subrounded, brown, no odour, dry to moist, homogeneous. [TILL]
2					2.0 m - digging becomes more difficult.
3					GRAVEL (GM) Clayey, silty, some fine to medium sand, maximum particle size = 500 mm, subrounded, brownish grey, no odour, moist, homogeneous, moderate cementation. [TILL]
4					
5	G	M2			END OF TEST PIT AT 5.0 m (maximum reach of excavator) Notes: 1. Moderate difficulty digging 2. No water observed. 3. Greyish content comes from clay content. 4. Elevation was extracted from DEM
6					
7					
8					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines
Moisture Content
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: Abacus Mining and Exploration Corporation

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC11-87

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 683101E, 5610720N
Ground Elevation: 913
Datum : NAD83

Excavator : Cat320DL
Operator : Roland

Start Date : 21 Apr 11
Finish Date : 21 Apr 11
Final Depth of Pit (m) : 1.5
Logged by : AR
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					SILT (ML) Trace sand, no plasticity, loose, brown, organic odour, moist, homogeneous, no cementation, some roots. [TOPSOIL]
1	G	M1	II		BEDROCK Greenish grey, medium to coarse grained, medium strong (R3), slightly weathered (W2), blocky, rips to ~10 cm blocks. [IRON MASK HYBRID] 1.40 m - Grain Size Analysis: 36% Cobble, 56% Gravel, 7% Sand, 1% Fines
2					END OF TEST PIT AT 1.5 m Notes: 1. Refusal on bedrock 2. No water observed 3. Sample collected at 1.50m 4. Elevation was extracted from DEM
3					
4					
5					
6					
7					
8					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: Abacus Mining and Exploration Corporation

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC11-88

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 683269E, 5610764N
Ground Elevation: 925
Datum : NAD83

Excavator : Cat320DL
Operator : Roland

Start Date : 21 Apr 11
Finish Date : 21 Apr 11
Final Depth of Pit (m) : 5.5
Logged by : AR
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					SILT (ML) Trace sand, non plastic, loose, brown, organic odour, moist, no structure, no cementation, some roots. [TOPSOIL]
1	G	M1			SAND (SM) Fine to medium grained, silty, some gravel, trace cobbles, trace boulders, well graded, compact to dense, maximum size 350 mm, rock pieces are subangular, brown, no odour, homogeneous, no to weak cementation. [TILL] 0.90 m - Grain Size Analysis: 48% Gravel, 25% Sand, 27% Fines 1.30 m - Moisture increases with depth, boulder content increases with depth up to 500 mm.
2					
3					
4	G	M2			4.0 M - Grain Size Analysis: 40% Gravel, 27% Sand, 26% Silt, 7% Clay
5					
6					END OF TEST PIT AT 5.5 m Notes: 1. Maximum reach of excavator 2. No water observed 3. Samples collected at: 0.90 m, 4.0 m 4. Elevation was extracted from DEM 5. Soluble sulphate content in M2 = 44 mg/kg
7					
8					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: Abacus Mining and Exploration Corporation

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC11-89

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 683391E, 5610799N
Ground Elevation: 929
Datum : NAD83

Excavator : Cat320DL
Operator : Roland

Start Date : 21 Apr 11
Finish Date : 21 Apr 11
Final Depth of Pit (m) : 3.1
Logged by : AR
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					SILT (ML) Sandy (fine), trace gravel, non plastic, soft to firm, brown, organic odour, moist, homogeneous, no cementation, some roots. [TOPSOIL]
1	G	M1			SAND (SM) Some silt to silty, gravelly, some cobbles, trace boulders, well graded, compact to dense, maximum particle size 350 mm, cobbles are subangular, brown, no odour, dry to moist, homogenous, no to weak cementation. [TILL] 1.10 m - Grain Size Analysis: 32% Gravel, 31% Sand, 26% Silt, 11% Clay
2					SAND and GRAVEL (SW/GW) Cobbley, some silt, some boulders, well graded, dense, maximum particle size = 500 mm, subrounded gravel, subangular cobbles and boulders, brown, no odour, moist, homogeneous, weak cementation. [TILL]
3	G	M2			3.00 m - Grain Size Analysis: 34% Gravel, 29% Sand, 24% Silt, 13% Clay END OF TEST PIT AT 3.10 m
4					Notes: 1. Refusal on dense till 2. No water observed 3. Samples collected at: 1.10 m, 3.00 m 4. Hard to rip / dig at bottom of hole. 5. Elevation was extracted from DEM 6. Soluble sulphate content in M2 = 5 mg/kg
5					
6					
7					
8					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines
Moisture Content
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: Abacus Mining and Exploration Corporation

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC11-90

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 683236E, 5610856N
Ground Elevation: 925
Datum : NAD83

Excavator : Cat320DL
Operator : Roland

Start Date : 21 Apr 11
Finish Date : 21 Apr 11
Final Depth of Pit (m) : 5.0
Logged by : AR
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					SILT (ML) Sandy, trace gravel, no to low plasticity, loose to compact, brown, organic odour, moist, no structure, no cementation, some roots. [TOPSOIL]
1	G	M1			SAND and GRAVEL (GW/SW) Some silt, some subangular boulders, some subangular cobbles, well graded, compact, maximum particle size 350 mm, brown, no odour, dry to moist, homogenous, weak cementation. [TILL] 1.10 m - Grain Size Analysis: 60% Gravel, 19% Sand, 21% Fines
2					SAND (SM) Fine to medium, silty, gravelly, some cobbles (subrounded), some subangular boulders, well graded, compact to dense, maximum particle size 400 mm, brown, no odour, moist, homogeneous, weak to moderate cementation. [TILL]
3					
4	G	M2			4.00 m - Grain Size Analysis: 24% Gravel, 30% Sand, 36% Silt, 10% Clay
5					END OF TEST PIT AT 5.0 m Notes: 1. Maximum reach of excavator. 2. No water observed. 3. Samples collected at: 1.10 m, and 4.00 m 4. Elevation was extracted from DEM 5. Soluble sulphate content in M2 = 694 mg/kg
6					
7					
8					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: Abacus Mining and Exploration Corporation

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC11-91

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 682962E, 5610789N
Ground Elevation: 920
Datum : NAD83

Excavator : Cat320DL
Operator : Roland

Start Date : 21 Apr 11
Finish Date : 21 Apr 11
Final Depth of Pit (m) : 0.7
Logged by : AR
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					SILT (ML) Some fine to medium sand, trace gravel, no plasticity, loose to compact, brown, organic odour, moist, no structure, no cementation, some roots. [TOPSOIL]
					END OF TEST PIT AT 0.7 m Notes: 1. Refusal on bedrock - Iron Mask Hybrid 2. No water observed 3. No samples taken 4. Elevation was extracted from DEM

Su - kPa: 40, 80, 120, 160

	FIELD	LAB	
VANE			▲ UC/2
PEAK	◆	■	
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content: W_P% × — — — ○ — — — × W_L%; W%: 20, 40, 60, 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: Abacus Mining and Exploration Corporation

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC11-92

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 683086E, 5610899N
Ground Elevation: 919
Datum : NAD83

Excavator : Cat320DL
Operator : Roland

Start Date : 21 Apr 11
Finish Date : 21 Apr 11
Final Depth of Pit (m) : 1.0
Logged by : AR
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					SILT (ML) Some fine to medium sand, no plasticity, loose, brown, organic odour, moist, no structure, no cementation, some roots. [TOP SOIL]
1			II		END OF TEST PIT AT 1.0 m Notes: 1. Refusal on bedrock - Iron Mask Hybrid 2. No water observed 3. No samples taken 4. Elevation was extracted from DEM
2					
3					
4					
5					
6					
7					
8					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines
Moisture Content
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: Abacus Mining and Exploration Corporation

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11

Project: Ajax Project Feasibility Study

TEST PIT # TP-BGC11-93

Location :

Project No. : 0712-003

Survey Method : Handheld GPS
Co-ordinates (m): 683027E, 5611057N
Ground Elevation: 939
Datum : NAD83

Excavator : Cat320DL
Operator : Roland

Start Date : 21 Apr 11
Finish Date : 21 Apr 11
Final Depth of Pit (m) : 4.0
Logged by : AR
Reviewed by : PQ

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					SILT (ML) Some fine to medium sand, no plasticity, loose, organic odour, moist, no structure, no cementation, some roots. [TOPSOIL]
1	G	M1			SAND and GRAVEL (SM/GM) Fine to medium, some silt to silty, trace cobbles, well graded, compact, maximum particle size 350 mm, cobbles and gravel are subrounded, brown, no odour, moist, faintly stratified, homogeneous, weak cementation, trace angular boulders 300 to 500 mm diameter. [TILL] 1.50 m - Grain Size Analysis: 42% Gravel, 27% Sand, 23% Silt, 8% Clay
2					
3					SAND and GRAVEL (SM/GM) Fine to medium, some silt to silty, trace cobbles, trace boulders, well graded, compact to dense, maximum particle size 350 mm, cobbles and gravel are subrounded, brown, no odour, moist, faintly stratified, homogeneous, weak to moderate cementation, trace angular boulders 300 to 500 mm diameter. [TILL] 3.90 m - Grain Size Analysis: 31% Gravel, 29% Sand, 30% Silt, 10% Clay
4		M2			END OF TEST PIT AT 4.0 m Notes: 1. Refusal on dense till and almost the maximum reach of excavator. 2. No water observed 3. Samples collected at: 1.50 m, and 4.00 m 4. Elevation was extracted from DEM
5					
6					
7					
8					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines

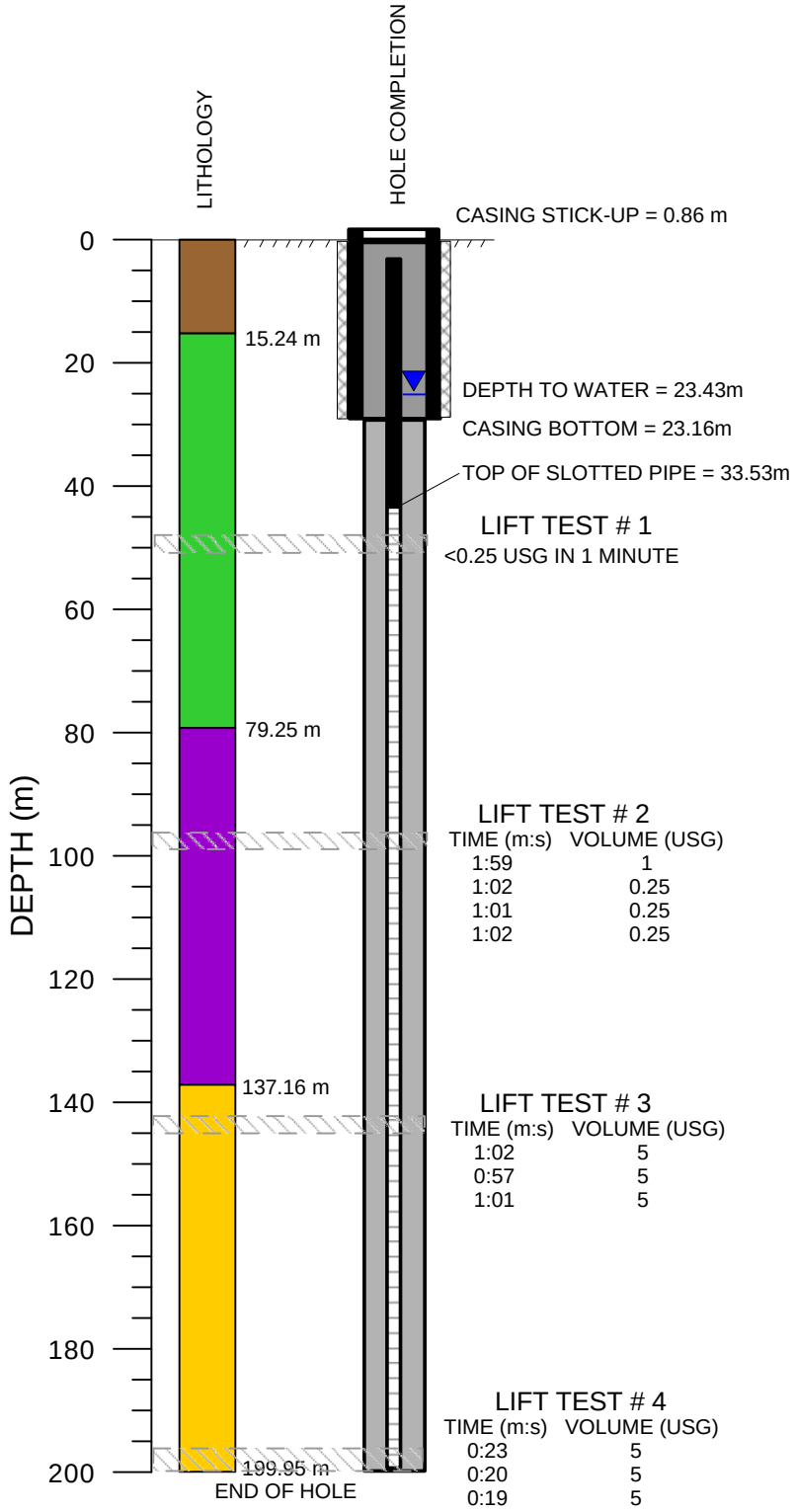
Moisture Content
W_P% W% W_L%
20 40 60 80

○ (1.50 m)
○ (3.90 m)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: Abacus Mining and Exploration Corporation

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 7/28/11



LITHOLOGY

- OVERBURDEN
- SUGARLOAF DIORITE (SLD)
- IRON MASK HYBRID (IMH)
- NICOLA VOLCANICS (NVV)
- PICRITE (NVP)

HOLE COMPLETION

- BLANK 114.3 mm (4.5") ID SCH 40 PVC
- SLOTTED 114.3 mm (4.5") ID SCH 40 PVC (0.020" SLOTTED)
- BENTONITE SEAL
- OPEN HOLE
- 254 mm (10") STEEL CASING
- STATIC WATER LEVEL
- AIRLIFT TESTING INTERVAL

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SCALE:	AS SHOWN	DESIGNED:	CK
DATE:	APR 2011	CHECKED:	TWC
DRAWN:	JW	APPROVED:	TWC

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

PROJECT:
AJAX PROJECT FEASIBILITY STUDY
PROTOTYPE DEWATERING WELL AND PUMPING TEST

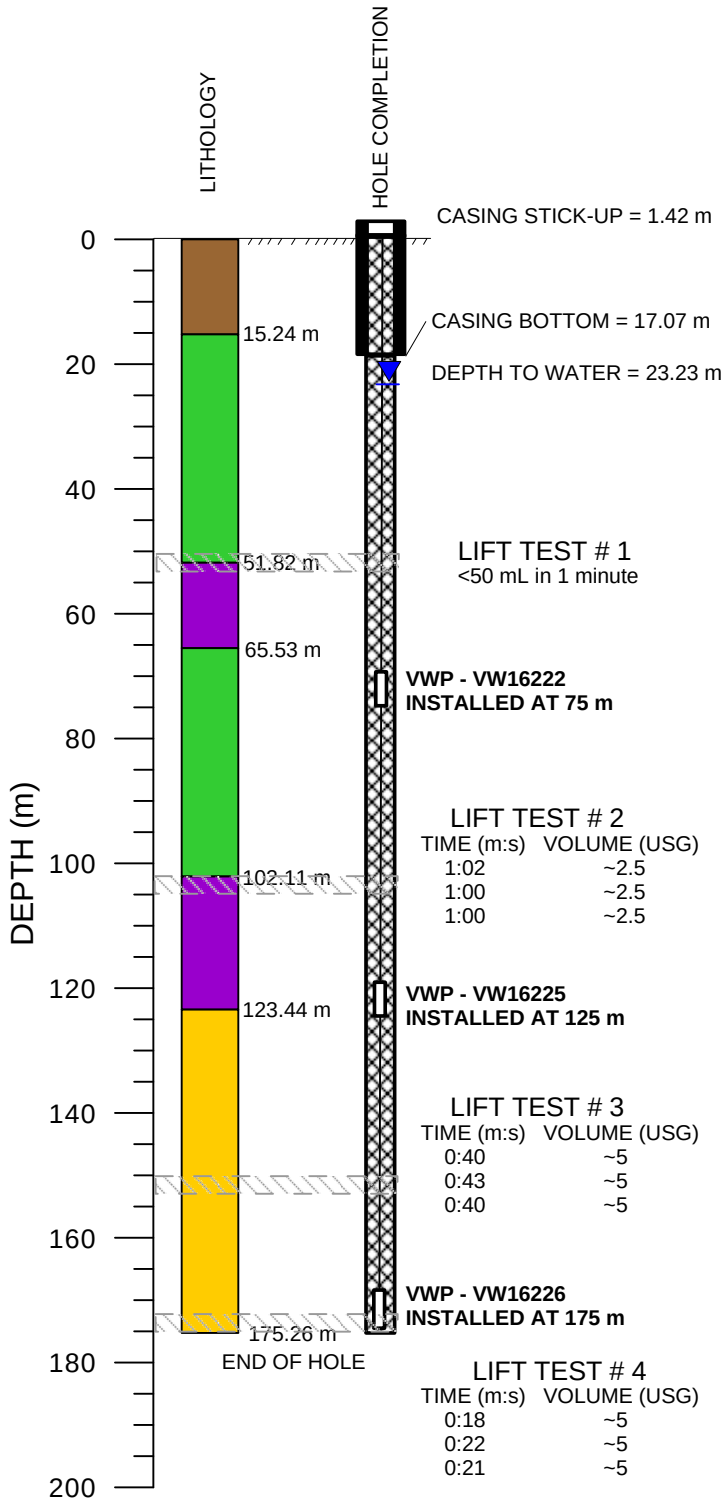
TITLE:
BGC10-PW01 DRILL LOG AND INSTALLATION DETAILS

CLIENT:
ABACUS MINING AND EXPLORATION CORP.

PROJECT No.:	FIG No.:	REV.:
0712-003-03	A1	A

N:\BGC\Projects\0712 Abacus\003 AJAX FS\Hydrogeology\03 Pumping Test Program\BGC10-PW1.grf

DWG. TO BE READ WITH BGC MEMO TITLED "AJAX PROJECT FEASIBILITY STUDY - PROTOTYPE DEWATERING WELL AND PUMPING TEST" DATED APRIL 2011.



LITHOLOGY

- OVERBURDEN
- SUGARLOAF DIORITE (SLD)
- IRON MASK HYBRID (IMH)
- NICOLA VOLCANICS (NVV)
- PICRITE (NVP)

HOLE COMPLETION

- VWP TRANSDUCER
- GROUT
- OPEN HOLE
- 203.2 mm (8") STEEL CASING
- WATER LEVEL
- AIRLIFT TESTING INTERVAL

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SCALE:	AS SHOWN	DESIGNED:	CK
DATE:	APR 2011	CHECKED:	TWC
DRAWN:	JW	APPROVED:	TWC

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

PROJECT:
AJAX PROJECT FEASIBILITY STUDY
PROTOTYPE DEWATERING WELL AND PUMPING TEST RESULTS

TITLE:
BGC10-MWA DRILL LOG AND INSTALLATION DETAILS

CLIENT:
ABACUS MINING AND EXPLORATION CORP.

PROJECT No.:	FIG No.:	REV.:
0712-003-03	A2	A

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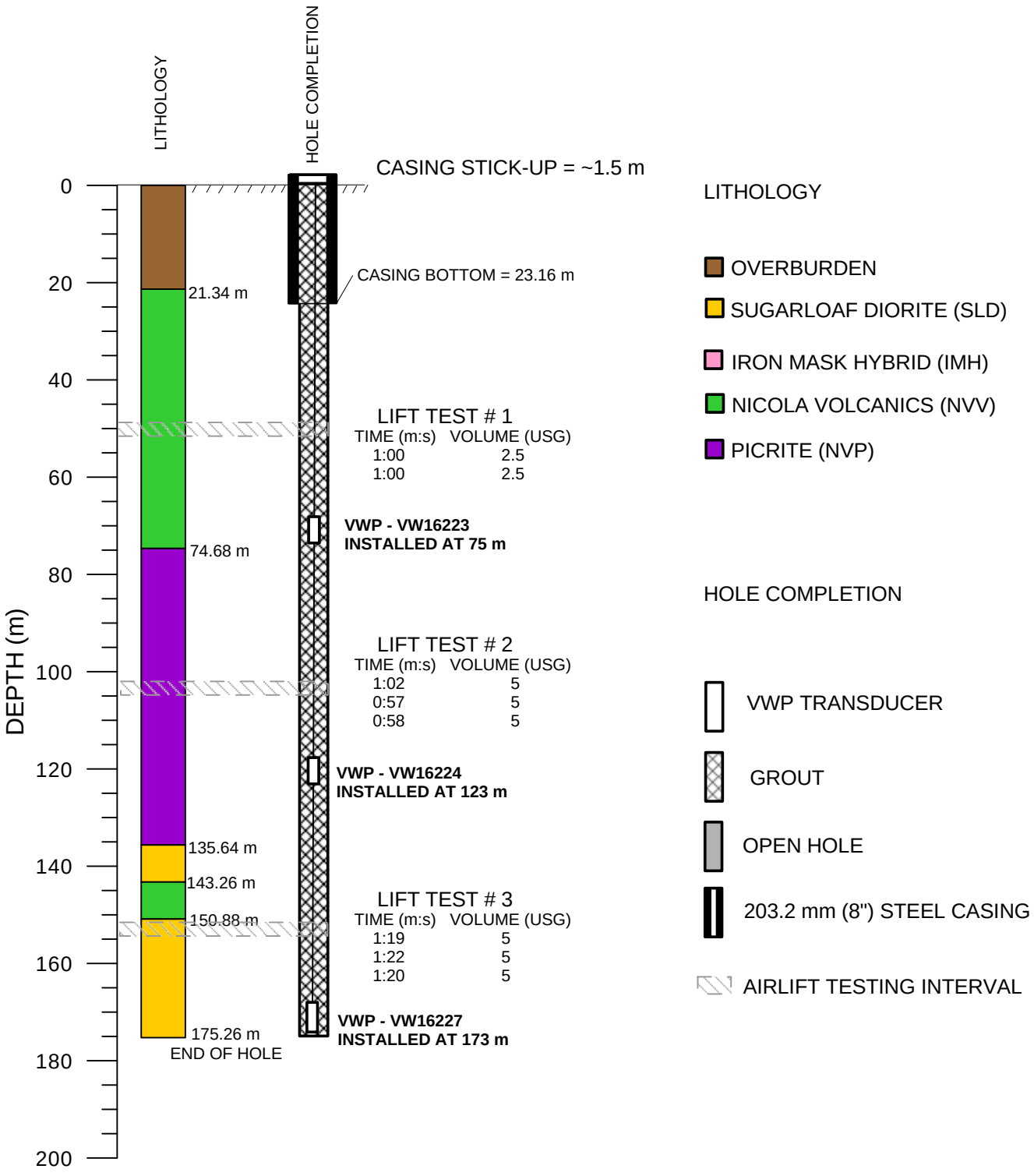

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SCALE:	AS SHOWN	DESIGNED:	CK
DATE:	APR 2011	CHECKED:	TWC
DRAWN:	JW	APPROVED:	TWC

BGC ENGINEERING INC.
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PROJECT:
AJAX PROJECT FEASIBILITY STUDY
PROTOTYPE DEWATERING WELL AND PUMPING TEST

TITLE:
BGC10-MWB DRILL LOG AND INSTALLATION DETAILS

CLIENT:
ABACUS MINING AND EXPLORATION CORP.

PROJECT No.:	FIG No.:	REV.:
0712-003-03	A3	A

N:\BGC\Projects\0712 Abacus\003 AJAX FS\Hydrogeology\03 Pumping Test Program\BGC10-MWB.grf

DWG. TO BE READ WITH BGC MEMO TITLED "AJAX PROJECT FEASIBILITY STUDY - PROTOTYPE DEWATERING WELL AND PUMPING TEST" DATED APRIL 2011.

LEGEND FOR TEST HOLE LOGS

The various parameters depicted on the test hole logs are described below according to the select headings found on the form.

Location

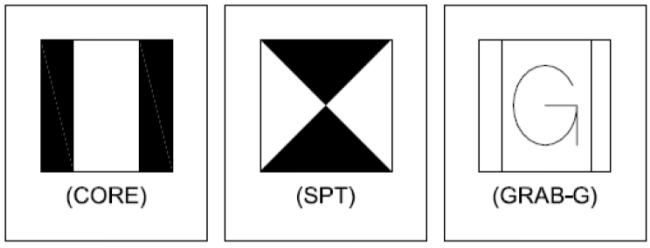
NWRSA: North Waste Rock Storage Area
EWRSA: East Waste Rock Storage Area

Depth

Depth below ground surface is measured in meters.

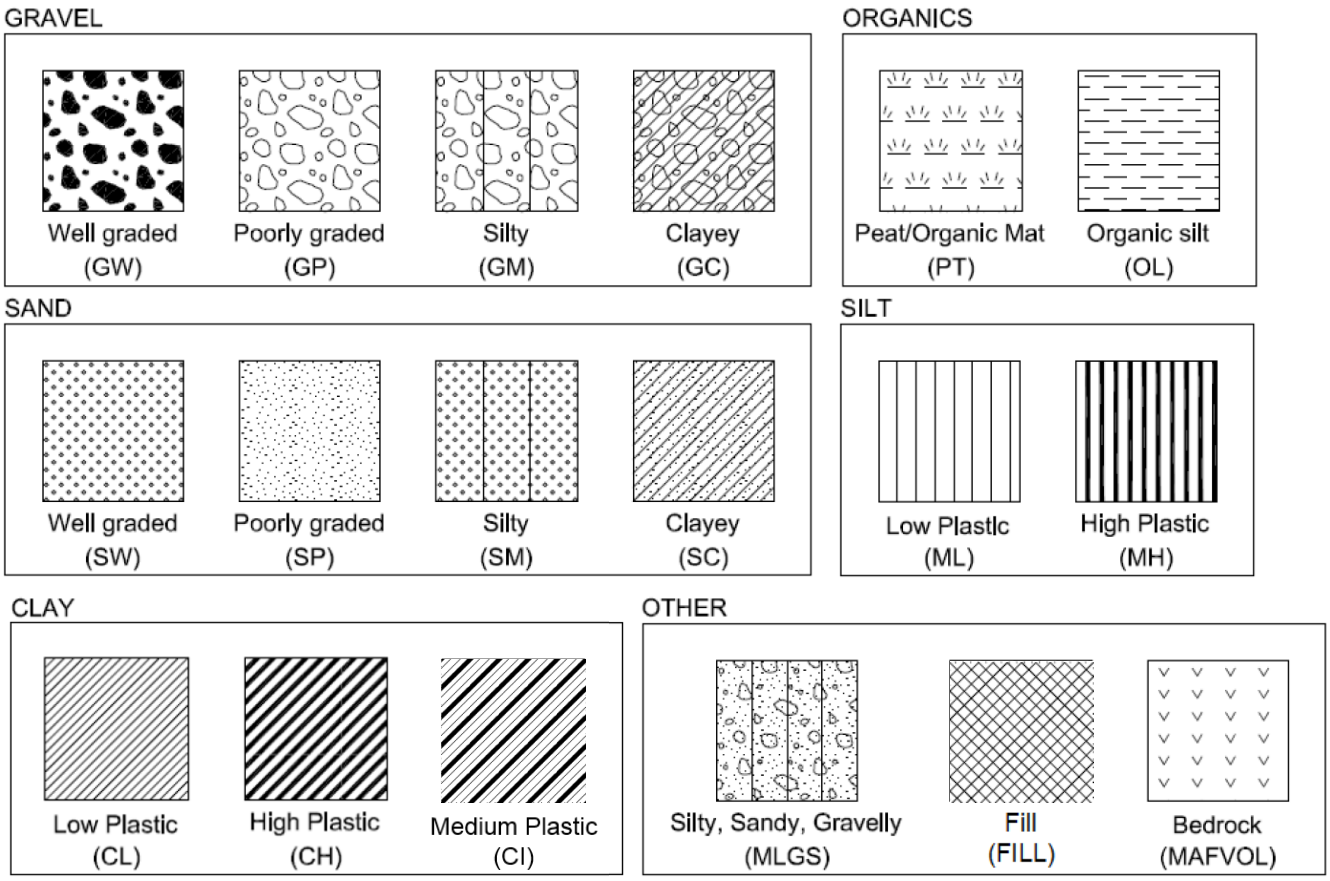
Sample Type and Sample Number

Samples are numbered and represented graphically by the symbols shown below. All samples collected form test holes are shown on the logs; however, not all of them have been tested.



Symbol

Sediment types and rock are represented graphically by the following symbols:



If a specific material is a combination of these categories, the symbol can be a mixture of any of these symbols.

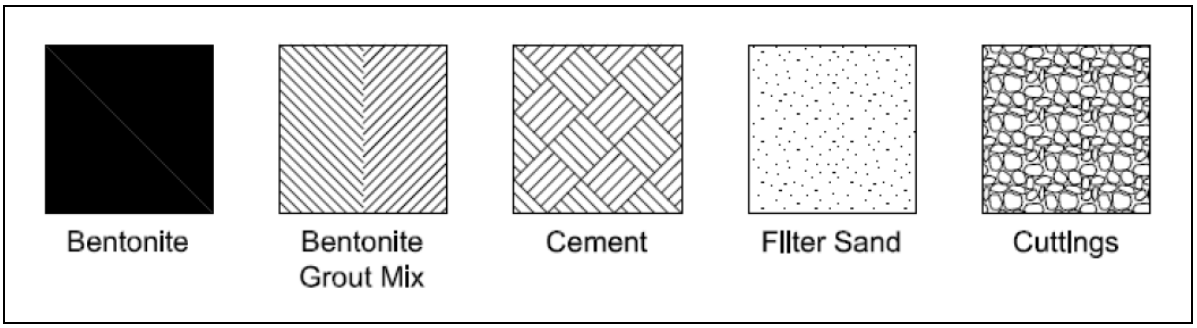
Lithologic Description

Sediments are described according to the Unified Soil Classification System (USCS). Bedrock is described according to the International Society for Rock Mechanics (ISRM 1978).
The following descriptions are typically listed for each main lithological unit on the logs: colour; grain size; hardness; alteration and weathering; vein and faulting characteristics; number of joint sets; typical alpha angles (i.e. angle to the core axis); if applicable, beta angles (i.e. degrees orientation line to lowest point downhole of joint); typical bedding angles; typical joint surface conditions such as shape (planar, curved, undulate, stepped and irregular), joint roughness (polished, slickensided, smooth, rough, very rough) (Barton and Choubey 1977), and Flysch rating (Marinos and Hoek 2001).
Individual representative discontinuities (joints, bedding, shears, minor faults) every 1 to 2 m and every major fault are picked out and described by (where possible) alpha and beta angle, infill type and thickness, joint surface shape and roughness and Joint Roughness Coefficient (JRC).

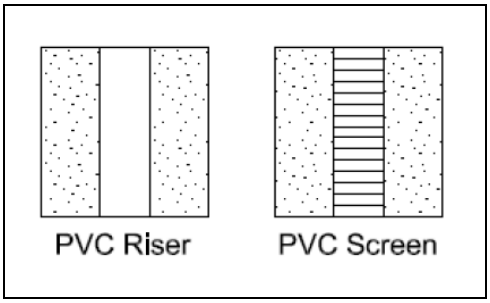
Instrument Details

Fill materials placed in the test holes are graphically represented by the symbols below. Some test holes have installations such as standpipe piezometers. These instruments are shown below in a default filter sand fill.

MATERIALS PLACED DOWN HOLE



INSTRUMENTATION SHOWN IN FILTER SAND



Core Recovery %

Core recovery is expressed as a percentage of the total length drilled or tested for each run. Recovery gives an indication of the quality of the ground being drilled or sampled and the general competency of the material.

RQD %

The Rock Quality Designation (RQD) is defined as the percentage of core recovered of intact pieces of 100 mm or more in length for the total length of core run (Deere and Deere, 1988). Only natural core breaks (i.e. joints) are considered in this calculation. Mechanical breaks due to drilling or handling are ignored.

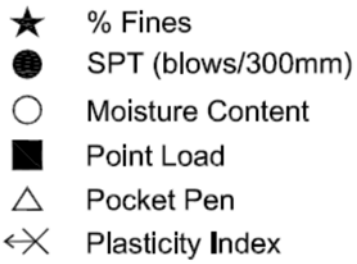
SPT Blows per 150 mm

This section gives numerical representation to the hardness of in-situ ground conditions. A hammer is repeatedly dropped from a fixed elevation which drives a split spoon into the ground collecting a soil sample. The number of blows required to drive the split spoon each 150 mm, for a total length of 450 mm, are counted and recorded. An ‘N-value’ is calculated by adding the total blow count for the last two 150 mm segments. The ‘N-value’ is correlated to the hardness of the soil conditions as shown in the table below. The field description is different for cohesive soils and granular soils.

	Soil Description	SPT 'N' Value	Field Test/Identification
Cohesive Soils	Very Soft	<2	Easily penetrated several inches by fist
	Soft	2 - 4	Easily penetrated several inches by thumb
	Firm	4 - 8	Can be penetrated by thumb with moderate effort
	Stiff	8 - 15	Can be penetrated by thumb but only with great effort
	Very Stiff	15 - 30	Readily indented by thumbnail
	Hard	>30	Indented with difficulty by thumbnail
Granular Soils	Very Loose	0 - 4	None
	Loose	4 - 10	Easily penetrated by 13 mm rod pushed by hand
	Compact	10 - 30	Easily penetrated by 13 mm rod driven by hammer
	Dense	30 - 50	Penetrated by 13 mm rod driven by hammer
	Very Dense	>50	Penetrated few cm's by 13 mm rod driven by hammer

Testing Results Section

This section shows the following field and lab testing results: Natural Moisture Content (%), Particle Size (% Fines – particles smaller than 0.075 mm), Pocket Penetrometer (kPa), Point Load Testing (kPa), SPT N, and Plasticity Index (%). Icons that depict the laboratory results on test logs are shown below.



Point Load Index

Point load test data from the field is converted into point load index values, also referred to as Induced Stress (Is) values (measured in MPa). This refers to adjusting stresses measured within the point load tester to stress induced in the core sample. These Is values are then converted into Is_{50} values, size correcting them to a standard 50 mm diameter core, which allows comparing point load index values of any sized core.

UCS Grade

The Unconfined Compressive Strength (UCS) Grade, (also known as field hardness), is based on simple mechanical tests, which are performed in the field using a rock hammer, pocket knife, and fingernail. The grades vary from extremely strong (Grade R6) to extremely weak (Grade R0), as shown in below. If the rock has undergone sufficient weathering or alteration such that the core has converted to soil, soil hardness grades are used.

UCS Grades for Rock and Soil Hardness (CFEM 2006)

	Grade	Description	Field Identification	UCS (MPa)	Point Load Index (MPa)
Rock Hardness	R6	Extremely Strong	Specimen can only be chipped with flat end of geological hammer.	>250	>10
	R5	Very Strong	Specimen requires many blows with flat end of geological hammer to fracture.	100-250	4-10
	R4	Strong	Specimen requires more than one blow of flat end of geological hammer to fracture.	50-100	2-4
	R3	Medium Strong	Cannot be scraped or peeled with pocket knife; can be fracture with single firm blow of flat end of geological hammer.	25-50	1-2
	R2	Weak	Can be peeled by a pocket knife with difficulty; shallow indentation made by firm blow with point of geological hammer.	5-25	-
	R1	Very Weak	Crumbles under firm blows with point of geological hammer.	1-5	-
	R0	Extremely Weak	Indented by thumbnail.	<1	-

	Grade	Description	Field Identification	SPT N Value	
Soil Hardness	S6	Hard	Indented with difficulty by thumbnail.	>30	-
	S5	Very Stiff	Readily indented by thumbnail.	15-30	-
	S4	Stiff	Readily indented by thumb but penetrated only with great effort.	8-15	-
	S3	Firm	With moderate effort, penetrates several centimeters by thumb.	4-8	-
	S2	Soft	Easily penetrated several centimeters by thumb.	2-4	-
	S1	Very Soft	Easily penetrated several centimeters by fist.	<2	-

Weathering Grade

Weathering and alteration of the rock mass is described according to Bieniawski 1976 parameters defined below.

Alteration and Weathering Rating (Bieniawski 1976)

Degree of Alteration/Weathering	Description	Rating
Fresh	Alteration may result in an improvement in rock competency (e.g. silicification)	W1
Slightly Weathered/Altered	Rock strength unchanged; weathering on joints only	W2
Moderately Weathered/Altered	Rock is discoloured but rock strength only slightly affected; discontinuities are weathered	W3
Highly Weathered/Altered	Rock is discoloured and strength is significantly reduced by weathering	W4
Completely Weathered/Altered	Original fabric and relict structures remain but rock is decomposed and friable	W5
Residual Soil	Original fabric destroyed	W6

Note: If alteration/weathering is > W4 or UCS grade ≤R0, then RQD is 0% for that section. Also, if the UCS grade ≤R0, the number of discontinuities is recorded as the default 99.

Project: AJAX MEMA Support

TEST PIT # TP-BGC13-01

Location : NWRSA Dam

Project No. : 1125-003

Survey Method : Handheld GPS
Co-ordinates (m): : 682,672E, 5,610,395N
Ground Elevation (m): 905
Datum : NAD83

Excavator : Hitachi, 200 LC
Operator : Grant, KIB

Start Date : 08 May 13
Finish Date : 08 May 13
Final Depth of Pit (m) : 3.29
Logged by : JW
Reviewed by : TWC

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					ORGANICS Silty, trace cobbles, dark brown, moist, loose, grass, trace rootlets.
1		G1			SILT (ML) Gravelly, sandy, trace cobbles, gap graded, low plasticity, dense, light brown, dry, homogeneous, weak cementation, sand is fine, maximum particle size is 210 mm. [TILL]
2					
3					
					END OF HOLE AT 3.29 m Notes: 1. Refusal at 3.29 m on dense till. 2. No groundwater seepage observed.
4					
5					
6					
7					
8					
9					
10					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines
Moisture Content
W_P% W% W_L%
20 40 60 80

△ △ >>△

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: KGHM International Ltd.

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 9/26/13

Project: AJAX MEMA Support

TEST PIT # TP-BGC13-02

Location : NWRSA Dam

Project No. : 1125-003

Survey Method : Handheld GPS
Co-ordinates (m): : 682,640E, 5,610,370N
Ground Elevation (m): 901
Datum : NAD83

Excavator : Hitachi, 200 LC
Operator : Grant, KIB

Start Date : 08 May 13
Finish Date : 08 May 13
Final Depth of Pit (m) : 3.30
Logged by : JW
Reviewed by : TWC

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					ORGANICS Silty, loose, dark brown, no odour, dry, trace rootlets.
1		G1			SILT (ML) Some sand, trace gravel, poorly graded, low plasticity, compact, light brown, dry, homogeneous, weak cementation, medium dry strength, trace rootlets, sand is fine, gravel is coarse, maximum particle size is 60 mm. [TILL] At 1.45 m - trace cobbles, maximum particle size is 480 mm.
2					
3					
4					END OF HOLE AT 3.3m Notes: 1. Refusal at 3.3 m on dense till. 2. No groundwater seepage observed.
5					
6					
7					
8					
9					
10					

Su - kPa

40 80 120 160

	FIELD	LAB	
VANE			▲ UC/2
PEAK	◆	■	
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content

W_P% W% W_L%

20 40 60 80

Project: AJAX MEMA Support

TEST PIT # TP-BGC13-03

Location : NWRSA Dam

Project No. : 1125-003

Survey Method : Handheld GPS
Co-ordinates (m): : 682,617E, 5,610,394N
Ground Elevation (m): 899
Datum : NAD83

Excavator : Hitachi, 200 LC
Operator : Grant, KIB

Start Date : 08 May 13
Finish Date : 08 May 13
Final Depth of Pit (m) : 3.01
Logged by : JW
Reviewed by : TWC

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					ORGANICS Silty, trace gravel, dark brown, no odour, trace rootlets.
1		G1			SILT (ML) Some gravel, trace sand, trace clay, trace cobbles, well graded, low plasticity, compact to dense, light brown, dry, homogeneous, weak cementation, trace rootlets, sand is fine, maximum particle size is 390 mm. [TILL] Below 1.81 m - increase in cobble content to some.
2					
3					END OF HOLE AT 3.01 m Notes: 1. Refusal at 3.01 m on dense till. 2. No groundwater seepage observed.
4					
5					
6					
7					
8					
9					
10					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines
Moisture Content
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: KGHM International Ltd.

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 9/26/13

Project: AJAX MEMA Support

TEST PIT # TP-BGC13-04

Location : NWRSA Dam

Project No. : 1125-003

Survey Method : Handheld GPS
Co-ordinates (m): : 682,642E, 5,610,454N
Ground Elevation (m): 907
Datum : NAD83

Excavator : Hitachi, 200 LC
Operator : Grant, KIB

Start Date : 08 May 13
Finish Date : 08 May 13
Final Depth of Pit (m) : 3.06
Logged by : JW
Reviewed by : TWC

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					ORGANICS Trace sand, trace silt, trace gravel, dark brown, no odour, dry, trace rootlets.
1		G1			SAND and SILT (SM) Sand is fine, trace gravel, trace cobbles, well graded, no to low plasticity, dense, maximum particle size is 230 mm, light brown, dry, homogeneous, weak cementation. [TILL]
3					END OF HOLE AT 3.06 m Notes: 1. Refusal at 3.06 m on dense till. 2. No groundwater seepage observed.

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines
Moisture Content
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: KGHM International Ltd.

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 9/26/13

Project: AJAX MEMA Support

TEST PIT # TP-BGC13-05

Location : NWRSA Dam

Project No. : 1125-003

Survey Method : Handheld GPS
Co-ordinates (m): : 682,692E, 5,610,454N
Ground Elevation (m): 906
Datum : NAD83

Excavator : Hitachi, 200 LC
Operator : Grant, KIB

Start Date : 08 May 13
Finish Date : 08 May 13
Final Depth of Pit (m) : 2.66
Logged by : JW
Reviewed by : TWC

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					ORGANICS Some silt, some sand, dark brown, no odour, trace rootlets.
1		G1			SILT (ML) Sandy, trace gravel, trace cobbles, well graded, no to low plasticity, compact to dense, medium brown, dry, homogeneous, weak cementation, sand is fine, maximum particle size is 280 mm. [TILL]
2					Below 2.16 m - increase in cobble content.
3					END OF HOLE AT 2.66 m Notes: 1. Refusal at 2.66 m on dense till. 2. No groundwater seepage observed.
4					
5					
6					
7					
8					
9					
10					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines
Moisture Content
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
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Client: KGHM International Ltd.

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 9/26/13

Project: AJAX MEMA Support

TEST PIT # TP-BGC13-06

Location : NWRSA Dam

Project No. : 1125-003

Survey Method : Handheld GPS
Co-ordinates (m): : 682,665E, 5,610,504N
Ground Elevation (m): 900
Datum : NAD83

Excavator : Hitachi, 200 LC
Operator : Grant, KIB

Start Date : 08 May 13
Finish Date : 08 May 13
Final Depth of Pit (m) : 3.10
Logged by : JW
Reviewed by : TWC

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					ORGANICS Trace silt, trace sand, trace gravel, dark brown, loose, no odour, dry, trace rootlets.
1		G1			SAND and SILT (SM) Fine, gravelly, trace cobbles, compact, dry, light brown, homogeneous, weak cementation, gravel is subrounded to subangular. [TILL] At 0.81 m - sand seam, approximately 15 mm thick, fine, subrounded, grey, dry. From 0.86 to 0.96 m - Particle Size Analysis: 28% gravel, 32% sand, 40% fines. Below 1.40 m - increase in cobble content to some.
2					
3					END OF HOLE AT 3.10 m Notes: 1. Refusal at 3.10 m on dense till. 2. No groundwater seepage observed.
4					
5					
6					
7					
8					
9					
10					

Su - kPa
40 80 120 160
VANE FIELD LAB
PEAK ◆ ■
REMOLD ◇ □
▲ UC/2
△ Pocket Pen /2
★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: KGHM International Ltd.

Project: AJAX MEMA Support

TEST PIT # TP-BGC13-07

Location : Plant Site

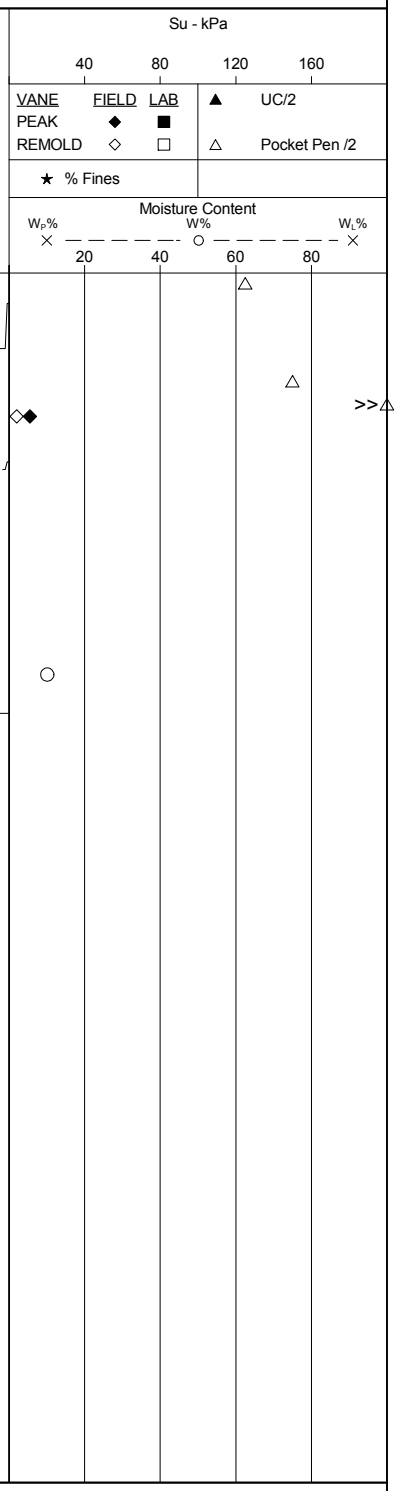
Project No. : 1125-003

Survey Method : Handheld GPS
Co-ordinates (m): : 682,915E, 5,610,641N
Ground Elevation (m): 905
Datum : NAD83

Excavator : Hitachi, 200 LC
Operator : Grant, KIB

Start Date : 08 May 13
Finish Date : 08 May 13
Final Depth of Pit (m) : 3.64
Logged by : JW
Reviewed by : AKU

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					ORGANICS Some silt, some sand, fine, trace clay, trace gravel, loose, no odour, dry, trace rootlets.
1		G1			SILT (ML) Sandy, some clay, some gravel, trace cobbles, low plasticity, dense, dry, brown, homogeneous, weak cementation, sand is fine, maximum particle size is 180 mm. [TILL]
2					CLAY (CI) Silty, sandy, some gravel, well graded, low plasticity, dense, moist, brown, homogeneous, weak to moderate cementation, no dilatancy, sand is fine, maximum particle size is 100 mm. [TILL]
3		G2			
4					END OF HOLE AT 3.64 m Notes: 1. Refusal at 3.64 m on dense till. 2. No groundwater seepage observed.
5					
6					
7					
8					
9					
10					



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Client: KGHM International Ltd.

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 9/26/13

Project: AJAX MEMA Support

TEST PIT # TP-BGC13-08

Location : Plant Site

Project No. : 1125-003

Survey Method : Handheld GPS
Co-ordinates (m): : 682,998E, 5,610,647N
Ground Elevation (m): 903
Datum : NAD83

Excavator : Hitachi, 200 LC
Operator : Grant, KIB

Start Date : 08 May 13
Finish Date : 08 May 13
Final Depth of Pit (m) : 1.42
Logged by : JW
Reviewed by : AKU

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					ORGANICS Some sand, fine, some silt, dark brown, no odour, dry, loose, trace rootlets.
1		G1			SILT (ML) Clayey, some sand, trace gravel, well graded, low plasticity, stiff to very stiff, brown, dry, homogeneous, moderate cementation, no dilatancy, sand is fine, maximum particle size is 140 mm. [TILL]
					END OF HOLE AT 1.42 m Notes: 1. Refusal at 1.42 m on bedrock. 2. No groundwater seepage observed.

Su - kPa
40 80 120 160
VANE FIELD LAB
PEAK ◆ ■
REMOLD ◇ □
▲ UC/2
△ Pocket Pen /2
★ % Fines
Moisture Content
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: KGHM International Ltd.

Project: AJAX MEMA Support

TEST PIT # TP-BGC13-09

Location : Plant Site

Project No. : 1125-003

Survey Method : Handheld GPS
Co-ordinates (m): : 682,857E, 5,610,788N
Ground Elevation (m): 939
Datum : NAD83

Excavator : Hitachi, 200 LC
Operator : Grant, KIB

Start Date : 09 May 13
Finish Date : 09 May 13
Final Depth of Pit (m) : 1.68
Logged by : JW
Reviewed by : AKU

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					ORGANICS Sandy, fine, trace gravel, compact, dark brown, no odour, dry, trace rootlets.
1		G1			SAND (SM) Fine to medium, gravelly, some silt, trace cobbles, well graded, maximum particle size is 290 mm, subangular, light brown, dry, homogeneous, no cementation. [TILL]
1		G2			
2					SAND and GRAVEL (SW-GW) Fine to medium, some gravel, trace silt, trace cobbles, trace boulders, well graded, dense, maximum particle size is 460 mm, subrounded to subangular, light brown, no cementation. [TILL]
3					END OF HOLE AT 1.68 m
4					Notes: 1. Bedrock (IMH): light grey with black flecks, medium to coarse grained, medium strong (R3), fresh and unweathered to slightly weathered (W1-W2), rips to 70 mm angular fragments. 2. Refusal at 1.68 m on dense till. 3. No groundwater seepage observed.
5					
6					
7					
8					
9					
10					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines
Moisture Content
W_P% W% W_L%
20 40 60 80

△

BGC ENGINEERING INC.
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Client: KGHM International Ltd.

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 9/26/13

Project: AJAX MEMA Support

TEST PIT # TP-BGC13-10

Location : Plant Site

Project No. : 1125-003

Survey Method : Handheld GPS
Co-ordinates (m): : 683,345E, 5,610,681N
Ground Elevation (m): 941
Datum : NAD83

Excavator : Hitachi, 200 LC
Operator : Grant, KIB

Start Date : 09 May 13
Finish Date : 09 May 13
Final Depth of Pit (m) : 2.96
Logged by : JW
Reviewed by : AKU

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					ORGANICS Some sand, fine, trace silt, loose, dark brown, no odour, dry, trace rootlets.
1		G1			SAND (SM) Fine to medium, silty, gravelly, trace cobbles, trace boulders, well graded, dense, maximum particle size is 290 mm, subrounded, brown, dry, homogeneous, no cementation, cobbles are slightly weathered. [TILL] From 0.82 to 0.92 m - Particle Size Analysis: 28% gravel, 39% sand, 33% fines. Below 1.35 m - increase in cobble content to some, no longer appear to be weathered.
2					
3					END OF HOLE AT 2.96 m Notes: 1. Refusal at 2.96 m on dense till. 2. No groundwater seepage observed. 3. Test pit was excavated 15 m north of planned site due to fence with no proximal gate.
4					
5					
6					
7					
8					
9					
10					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
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Client: KGHM International Ltd.

Project: AJAX MEMA Support

TEST PIT # TP-BGC13-11

Location : Plant Site

Project No. : 1125-003

Survey Method : Handheld GPS
Co-ordinates (m): : 683,313E, 5,610,751N
Ground Elevation (m): 927
Datum : NAD83

Excavator : Hitachi, 200 LC
Operator : Grant, KIB

Start Date : 09 May 13
Finish Date : 09 May 13
Final Depth of Pit (m) : 4.10
Logged by : JW
Reviewed by : AKU

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					ORGANICS Some sand, trace clay, trace gravel, dense, dark brown, no odour, dry, no cementation.
1		G1			CLAY (CL) Silty, trace sand, trace gravel, trace cobbles, low plasticity, firm to stiff, medium brown, no odour, increases from dry to moist with depth, homogeneous, moderate cementation, low toughness, slow dilatancy, sand is fine, maximum particle size is 250 mm. [TILL] From 0.83 to 0.93 m - Particle Size Analysis: 0% gravel, 2.9% sand, 97% fines.
2					
3					GRAVEL (GM) Fine to coarse, sandy, silty, some cobbles, some clay, well graded, dense, maximum particle size is 190 mm, elongated, subrounded, light greyish brown, moist, moderate cementation, sand is fine to coarse. Matrix: no to low plasticity, moist, slow dilatancy. [TILL]
4		G2			END OF HOLE AT 4.10 m Notes: 1. Refusal at 4.10 m on dense till. 2. No groundwater seepage observed.
5					
6					
7					
8					
9					
10					

Su - kPa
40 80 120 160
VANE FIELD LAB
PEAK ◆ ■
REMOLD ◇ □
▲ UC/2
△ Pocket Pen /2
★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

>>△

BGC ENGINEERING INC.
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Client: KGHM International Ltd.

Project: AJAX MEMA Support

TEST PIT # TP-BGC13-12

Location : Plant Site

Project No. : 1125-003

Survey Method : Handheld GPS
Co-ordinates (m): : 683,445E, 5,610,808N
Ground Elevation (m): 939
Datum : NAD83

Excavator : Hitachi, 200 LC
Operator : Grant, KIB

Start Date : 09 May 13
Finish Date : 09 May 13
Final Depth of Pit (m) : 2.72
Logged by : JW
Reviewed by : AKU

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					ORGANICS Sandy, trace silt, trace gravel, loose, dark brown, no odour, dry, trace rootlets.
1		G1			SAND (SW) Medium, gravelly, trace silt, trace cobbles, well graded, dense, maximum particle size is 240 mm, rounded to angular, brown, homogeneous, no cementation. [TILL]
2					SAND and GRAVEL (SP-GP) Fine to medium, some gravel, gap graded, dense, maximum particle size is 70 mm, subangular, light brown, homogeneous, no cementation, gravel is fine to coarse. [TILL]
3		G2			END OF HOLE AT 2.72 m Notes: 1. Refusal at 2.72 m on dense till. 2. No groundwater seepage observed.
4					
5					
6					
7					
8					
9					
10					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines
Moisture Content
W_P% W% W_L%
20 40 60 80

△ 1.3

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 9/26/13

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: KGHM International Ltd.

Project: AJAX MEMA Support

TEST PIT # TP-BGC13-13

Location : Truck Shop

Project No. : 1125-003

Survey Method : Handheld GPS
Co-ordinates (m): : 683,834E, 5,610,945N
Ground Elevation (m): 973
Datum : NAD83

Excavator : Hitachi, 200 LC
Operator : Grant, KIB

Start Date : 09 May 13
Finish Date : 09 May 13
Final Depth of Pit (m) : 2.30
Logged by : JW
Reviewed by : AKU

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					ORGANICS Some sand, fine to medium, some silt, loose, dark brown, no odour, dry, trace rootlets.
1		G1			SAND (SC) Fine to coarse, clayey, gravelly, trace cobbles, well graded, dense, maximum particle size is 140 mm, subangular, brown, dry to moist, no to weak cementation, gravel is medium to coarse, clay is low to medium plasticity, no dilatancy. [TILL]
2		G2			SAND and GRAVEL (GC) Sand is fine to coarse, gravel is fine to coarse, subangular, clayey, trace cobbles, trace boulders, well graded, dense, maximum particle size is 330 mm, brown, dry to moist, homogeneous, strong cementation. [TILL]
3					END OF HOLE AT 2.30 m Notes: 1. Refusal at 2.30 m on dense till. 2. No groundwater seepage observed.
4					
5					
6					
7					
8					
9					
10					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines
Moisture Content
W_P% W% W_L%
20 40 60 80

△ △ ○

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: KGHM International Ltd.

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 9/26/13

Project: AJAX MEMA Support

TEST PIT # TP-BGC13-14

Location : Truck Shop

Project No. : 1125-003

Survey Method : Handheld GPS
Co-ordinates (m): : 683,801E, 5,610,997N
Ground Elevation (m): 975
Datum : NAD83

Excavator : Hitachi, 200 LC
Operator : Grant, KIB

Start Date : 10 May 13
Finish Date : 10 May 13
Final Depth of Pit (m) : 2.13
Logged by : JW
Reviewed by : AKU

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					ORGANICS Some silt, some sand, fine, trace gravel, dark brown, no odour, dry to moist, trace rootlets.
1		G1			GRAVEL (GW) Fine to coarse, sandy, trace clay, trace cobbles, well graded, dense, maximum particle size is 410 mm, subrounded to subangular, brown, dry, homogeneous, weak cementation, sand is fine. [TILL]
2		G2			END OF HOLE AT 2.10 m Notes: 1. Refusal at 2.13 m on dense till. 2. No groundwater seepage observed.
3					
4					
5					
6					
7					
8					
9					
10					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

△ ○

BGC ENGINEERING INC.
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Client: KGHM International Ltd.

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 9/26/13

Project: AJAX MEMA Support

TEST PIT # TP-BGC13-15

Location : Truck Shop

Project No. : 1125-003

Survey Method : Handheld GPS
Co-ordinates (m): : 683,837E, 5,611,047N
Ground Elevation (m): 979
Datum : NAD83

Excavator : Hitachi, 200 LC
Operator : Grant, KIB

Start Date : 10 May 13
Finish Date : 10 May 13
Final Depth of Pit (m) : 1.64
Logged by : JW
Reviewed by : AKU

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					ORGANICS Sandy, fine to medium, some gravel, dark brown, no odour, dry to moist, trace rootlets.
1		G1			GRAVEL and SAND (GC) Gravel is fine to coarse, sand is fine to medium, some clay, trace cobbles, trace boulders, well graded, dense, maximum particle size is 390 mm, rounded to subangular, dry to moist, homogeneous, no cementation. [TILL]
		G2			
2					END OF HOLE AT 1.64 m Notes: 1. Refusal at 1.64 m on dense till. 2. No groundwater seepage observed.
3					
4					
5					
6					
7					
8					
9					
10					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

△ ○

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 9/26/13

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: KGHM International Ltd.

Project: AJAX MEMA Support

TEST PIT # TP-BGC13-16

Location : Truck Shop

Project No. : 1125-003

Survey Method : Handheld GPS
Co-ordinates (m): : 683,900E, 5,611,008N
Ground Elevation (m): 973
Datum : NAD83

Excavator : Hitachi, 200 LC
Operator : Grant, KIB

Start Date : 10 May 13
Finish Date : 10 May 13
Final Depth of Pit (m) : 1.80
Logged by : JW
Reviewed by : AKU

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					ORGANICS Sandy, fine to medium, some gravel, trace cobbles, brown, no odour, dry, trace rootlets.
1		G1			GRAVEL and SAND (GC) Gravel is fine to coarse, sand is fine to medium, some clay, trace cobbles, well graded, dense, maximum particle size is 230 mm, dry, homogeneous, clay has low plasticity, no dilatancy. [TILL]
		G2			
2					END OF HOLE AT 1.80 m Notes: 1. Refusal at 1.80 m on dense till. 2. No groundwater seepage observed.
3					
4					
5					
6					
7					
8					
9					
10					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines
Moisture Content
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
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Client: KGHM International Ltd.

Project: AJAX MEMA Support

TEST PIT # TP-BGC13-17

Location : North Wall Dam

Project No. : 1125-003

Survey Method : Handheld GPS
Co-ordinates (m): : 685,089E, 5,610,634N
Ground Elevation (m): 950
Datum : NAD83

Excavator : Hitachi, 200 LC
Operator : Grant, KIB

Start Date : 10 May 13
Finish Date : 10 May 13
Final Depth of Pit (m) : 1.83
Logged by : JW
Reviewed by : TWC

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					ORGANICS Sandy, fine, some silt, dark brown, organic odour, dry, trace rootlets.
1		G1 G2			SILT (ML) Clayey, sandy, trace gravel, trace cobbles, well graded, no to low plasticity, firm, medium brown, homogeneous, weak cementation, slow dilatancy, gravel is fine to coarse, maximum particle size is 180 mm, subrounded to subangular, sand is fine to coarse. [TILL]
2		G3			At 0.64 m - sand seam, approximately 70 mm thick, coarse, poorly graded, loose, angular, grey to green, dry, no cementation. From 0.75 to 0.85 m - Hydrometer Analysis: 6% gravel, 21% sand, 73% fines.
3					SILT (ML) Sandy, some gravel, trace cobbles, well graded, low plasticity, stiff, medium brown, no odour, dry, mottled texture (occasional), moderate to strong cementation, low toughness, slow dilatancy, sand is fine to medium, gravel is fine to coarse, maximum particle size is 320 mm, subrounded to subangular. [TILL]
4					BEDROCK Light grey, coarse grained, medium strong to strong (R3-R4), fresh and unweathered to slightly weathered (W1-W2), rips to 150 mm angular fragments. [IRON MASK HYBRID]
5					END OF HOLE AT 1.83 m Notes: 1. Refusal at 1.83 m on bedrock. 2. No groundwater seepage observed.
6					
7					
8					
9					
10					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
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Client: KGHM International Ltd.

Project: AJAX MEMA Support

TEST PIT # TP-BGC13-18

Location : North Wall Dam

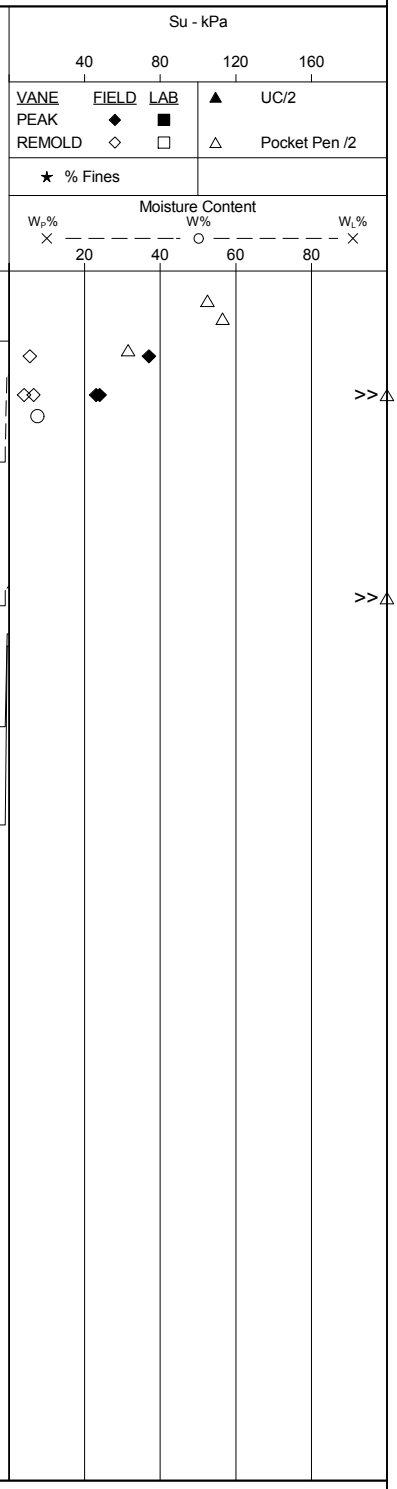
Project No. : 1125-003

Survey Method : Handheld GPS
Co-ordinates (m): : 685,272E, 5,610,628N
Ground Elevation (m): 946
Datum : NAD83

Excavator : Hitachi, 200 LC
Operator : Grant, KIB

Start Date : 10 May 13
Finish Date : 10 May 13
Final Depth of Pit (m) : 3.10
Logged by : JW
Reviewed by : TWC

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					ORGANICS Sandy, fine, some silt, dark brown, no odour, moist, trace rootlets.
1		G1			SAND (SM) Fine to medium, silty, trace gravel, gap graded, compact, maximum particle size is 160 mm, moist, weak to moderate cementation, silt has low plasticity, no dilatancy, gravel is medium to coarse. [TILL]
2		G2			SAND (SM) Fine to medium, gravelly, silty, trace clay, trace cobbles, well graded, dense, maximum particle size is 240 mm, elongated, subrounded, moist, weak to moderate cementation. [TILL]
3		G3			From 1.20 to 1.30 m - Hydrometer Analysis: 27% gravel, 42% sand, 30% fines. SILT (ML) Sandy, some gravel, trace cobbles, low to medium plasticity, stiff, brown, homogeneous, moderate cementation, slow dilatancy, sand is fine, maximum particle size is 180 mm. [TILL]
4					BEDROCK Medium to coarse grained, medium strong to strong (R3-R4), slightly to moderately weathered (W2-W3), rips to 140 mm fragments. [IRON MASK HYBRID]
5					END OF HOLE AT 3.10 m Notes: 1. Refusal at 3.10 m on bedrock. 2. No groundwater seepage observed.
6					
7					
8					
9					
10					



BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: KGHM International Ltd.

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 9/26/13

Project: AJAX MEMA Support

TEST PIT # TP-BGC13-19

Location : EWRSA

Project No. : 1125-003

Survey Method : Handheld GPS
Co-ordinates (m): : 686,149E, 5,610,690N
Ground Elevation (m): 990
Datum : NAD83

Excavator : Hitachi, 200 LC
Operator : Grant, KIB

Start Date : 10 May 13
Finish Date : 10 May 13
Final Depth of Pit (m) : 4.17
Logged by : JW
Reviewed by : BMM

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					ORGANICS Silty, loose, dark brown, no odour, dry, no cementation, trace rootlets.
1		G1			SILT (ML) Sandy, some gravel, trace cobbles, no to low plasticity, firm, brown, moist, homogeneous, weak to moderate cementation, slow dilatancy, sand is fine to coarse, gravel is elongated, subangular. [TILL]
2					Below 2.17 m - increase in moisture content.
3					
4					END OF HOLE AT 4.17 m
5					Notes: 1. Refusal at 4.17 m on dense till. 2. No groundwater seepage observed.
6					
7					
8					
9					
10					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines
Moisture Content
W_P% W% W_L%
20 40 60 80

>>△

Project: AJAX MEMA Support

TEST PIT # TP-BGC13-20

Location : EWRSA

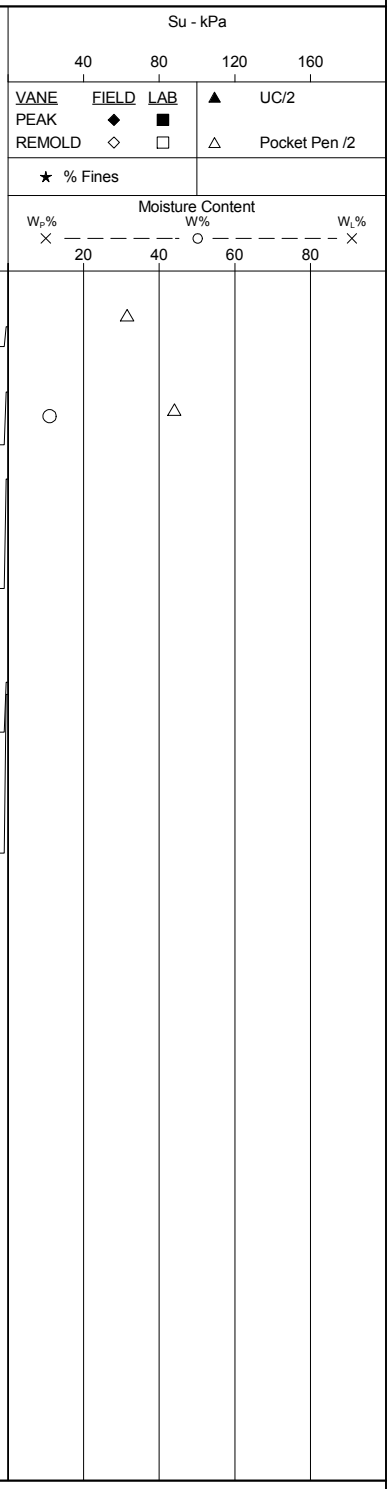
Project No. : 1125-003

Survey Method : Handheld GPS
Co-ordinates (m): : 686,163E, 5,610,164N
Ground Elevation (m): 946
Datum : NAD83

Excavator : Hitachi, 200 LC
Operator : Grant, KIB

Start Date : 11 May 13
Finish Date : 11 May 13
Final Depth of Pit (m) : 3.40
Logged by : JW
Reviewed by : BMM

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					ORGANICS Sandy, loose, dark brown, dry to moist, trace rootlets. Circular clumps of white "talc-like" clay sized material.
1		G1			SAND (SM) Fine, silty, trace gravel, poorly graded, compact, maximum particle size is 110 mm, dry to moist, homogeneous, weak cementation. [TILL]
		G2			
2		G3			SAND (SC-SM) Silty, clayey, gravelly, trace cobbles, trace boulders, compact, brown, moist, homogeneous, moderate cementation. [TILL] From 1.20 to 1.30 m - Particle Size Analysis: 22% gravel, 37% sand, 41% fines.
3					GRAVEL and SAND (GP) Gravel is fine to coarse, sand is medium to coarse, gap graded, compact, maximum particle size is 320 mm, elongated, subrounded to subangular, moist, homogeneous. Gravel consists of slightly weathered fragments of bedrock. [WEATHERED BEDROCK]
4					BEDROCK Dark grey, blocky, weak to medium strong (R2-R3), fresh and unweathered to slightly weathered (W1-W2), iron oxidation present, rips to 150 mm angular fragments. [IRON MASK HYBRID]
5					END OF HOLE AT 3.40 m
6					Notes: 1. Refusal at 3.40 m on bedrock. 2. Groundwater seepage observed at 3.25 m. 3. Walls of test pit caved while photos were being taken.
7					
8					
9					
10					



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Client: KGHM International Ltd.

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 9/26/13

Project: AJAX MEMA Support

TEST PIT # TP-BGC13-21

Location : EWRSA

Project No. : 1125-003

Survey Method : Handheld GPS
Co-ordinates (m): : 685,959E, 5,610,049N
Ground Elevation (m): 974
Datum : NAD83

Excavator : Hitachi, 200 LC
Operator : Grant, KIB

Start Date : 11 May 13
Finish Date : 11 May 13
Final Depth of Pit (m) : 2.80
Logged by : JW
Reviewed by : BMM

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					ORGANICS Some sand, some silt, dark brown, no odour, trace rootlets.
1		G1			GRAVEL (GC) Silty, sandy, gravelly, trace cobbles, compact to dense, brown, dry to moist, homogeneous, moderate cementation. [TILL] From 1.00 to 1.10 m - Particle Size Analysis: 46% gravel, 25% sand, 29% fines. Below 1.56 m - increase in gravel content to some, subangular.
2					
3					END OF HOLE AT 2.80 m Notes: 1. Refusal at 2.80 m on dense till. 2. No groundwater seepage observed.
4					
5					
6					
7					
8					
9					
10					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines
Moisture Content
W_P% W% W_L%
20 40 60 80

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Client: KGHM International Ltd.

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 9/26/13

Project: AJAX MEMA Support

TEST PIT # TP-BGC13-22

Location : EWRSA

Project No. : 1125-003

Survey Method : Handheld GPS
Co-ordinates (m): : 685,933E, 5,609,669N
Ground Elevation (m): 940
Datum : NAD83

Excavator : Hitachi, 200 LC
Operator : Grant, KIB

Start Date : 11 May 13
Finish Date : 11 May 13
Final Depth of Pit (m) : 3.58
Logged by : JW
Reviewed by : BMM

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					ORGANICS Some sand, some silt, dark brown, no odour, dry, trace rootlets. Layer of cobbles at contact with lower layer.
1		G1			SAND (SP) Fine to coarse, some gravel, trace silt, trace cobbles, poorly graded, maximum particle size is 220 mm, angular, dry to moist, no cementation, gravel is fine to coarse, subangular. [TILL]
2					SAND (SM) Fine to coarse, gravelly, silty, trace cobbles, trace boulders, well graded, dense, maximum particle size is 480 mm, subangular, moist, homogeneous, no to weak cementation, silty matrix has low plasticity, gravel is fine to coarse. [TILL]
3		G2			
4					END OF HOLE AT 3.85 m Notes: 1. Refusal at 3.85 m on dense till. 2. No groundwater seepage observed.
5					
6					
7					
8					
9					
10					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

△ 1.3

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Client: KGHM International Ltd.

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 9/26/13

Project: AJAX MEMA Support

TEST PIT # TP-BGC13-23

Location : EWRSA

Project No. : 1125-003

Survey Method : Handheld GPS
Co-ordinates (m): : 686,330E, 5,609,800N
Ground Elevation (m): 956
Datum : NAD83

Excavator : Hitachi, 200 LC
Operator : Grant, KIB

Start Date : 11 May 13
Finish Date : 11 May 13
Final Depth of Pit (m) : 2.35
Logged by : JW
Reviewed by : BMM

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					ORGANICS Silty, loose, dark brown, no odour, dry, trace rootlets.
1		G1			SAND and SILT (SM) Sand is fine, some gravel, trace clay, trace cobbles, well graded, medium plasticity, firm, maximum particle size is 180 mm, brown, dry to moist, homogeneous, weak cementation, rapid dilatancy, gravel is fine to coarse, elongated, subangular. [TILL]
2					
					END OF HOLE AT 2.35 m
3					Notes: 1. Refusal at 2.35 m on boulders. 2. No groundwater seepage observed.
4					
5					
6					
7					
8					
9					
10					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

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Client: KGHM International Ltd.

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 9/26/13

Project: AJAX MEMA Support

TEST PIT # TP-BGC13-24

Location : EWRSA

Project No. : 1125-003

Survey Method : Handheld GPS
Co-ordinates (m): : 686,491E, 5,609,699N
Ground Elevation (m): 928
Datum : NAD83

Excavator : Hitachi, 200 LC
Operator : Grant, KIB

Start Date : 11 May 13
Finish Date : 11 May 13
Final Depth of Pit (m) : 1.90
Logged by : JW
Reviewed by : BMM

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					ORGANICS Some silt, trace gravel, trace boulders, loose to compact, dark brown, organic odour, dry.
1		G1			SAND and SILT (SM) Fine to coarse, gravelly, trace cobbles, trace boulders, well graded, dense, maximum particle size is 260 mm, subangular, dry, homogeneous, weak to moderate cementation, silty matrix has no to low plasticity, gravel is medium to coarse, subrounded. [TILL] From 0.90 to 1.00 m - Particle Size Analysis: 29% gravel, 33% sand, 38% fines.
2					END OF HOLE AT 1.90 m Notes: 1. Refusal at 1.90 m on dense till and cobbles. 2. No groundwater seepage observed.
3					
4					
5					
6					
7					
8					
9					
10					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

○ △

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Client: KGHM International Ltd.

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 9/26/13

Project: AJAX MEMA Support

TEST PIT # TP-BGC13-25

Location : EWRSA

Project No. : 1125-003

Survey Method : Handheld GPS
Co-ordinates (m): : 686,852E, 5,609,521N
Ground Elevation (m): 904
Datum : NAD83

Excavator : Hitachi, 200 LC
Operator : Grant, KIB

Start Date : 11 May 13
Finish Date : 11 May 13
Final Depth of Pit (m) : 2.11
Logged by : JW
Reviewed by : BMM

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					ORGANICS Silty, loose, dark brown, no odour, dry, trace rootlets.
1		G1			SILT (ML) Sandy, some gravel, trace cobbles, trace boulders, nonplastic, hard, dry, slight fissured texture (breaks into 15 mm thick layers), moderate to strong cementation, gravel is fine to coarse, rounded, subangular. [TILL] From 1.30 to 1.40 m - Particle Size Analysis: 11% gravel, 32% sand, 57% fines.
2					END OF HOLE AT 2.11 m Notes: 1. Refusal at 2.11 m on dense till. 2. No groundwater seepage observed.
3					
4					
5					
6					
7					
8					
9					
10					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines
Moisture Content
W_P% W% W_L%
20 40 60 80

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Client: KGHM International Ltd.

Project: AJAX MEMA Support

TEST PIT # TP-BGC13-26

Location : EWRSA

Project No. : 1125-003

Survey Method : Handheld GPS
Co-ordinates (m): : 687,142E, 5,609,666N
Ground Elevation (m): 888
Datum : NAD83

Excavator : Hitachi, 200 LC
Operator : Grant, KIB

Start Date : 11 May 13
Finish Date : 11 May 13
Final Depth of Pit (m) : 3.07
Logged by : JW
Reviewed by : BMM

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					ORGANICS Sandy, some silt, dark brown, no odour, moist, trace rootlets.
1		G1			SAND (SP) Medium to coarse, gravelly, trace cobbles, gap graded, compact, maximum particle size is 170 mm, subangular, dry to moist, gravel is fine to coarse, subrounded to angular. Walls of the test pit are unstable in this material. [TILL]
2					From 1.20 to 1.30 m - Particle Size Analysis: 35% gravel, 56% sand, 9% fines.
3		G2			SAND (SM) Fine, silty, some gravel, trace cobbles, well graded, dense, maximum particle size is 260 mm subangular, dry, homogeneous, moderate to strong cementation, silt has no plasticity, gravel is medium to coarse, rounded to subangular. [TILL]
					END OF HOLE AT 3.07 m
4					Notes: 1. Refusal at 3.07 m on dense till. 2. No groundwater seepage observed.
5					
6					
7					
8					
9					
10					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines
Moisture Content
W_P% W% W_L%
20 40 60 80

Project: AJAX MEMA Support

TEST PIT # TP-BGC13-27

Location : EWRSA Dam

Project No. : 1125-003

Survey Method : Handheld GPS
Co-ordinates (m): : 687,171E, 5,609,511N
Ground Elevation (m): 874
Datum : NAD83

Excavator : Hitachi, 200 LC
Operator : Grant, KIB

Start Date : 11 May 13
Finish Date : 11 May 13
Final Depth of Pit (m) : 3.68
Logged by : JW
Reviewed by : TWC

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					ORGANICS Some sand, loose to compact, dark brown, no odour, slightly moist, trace rootlets.
1		G1			GRAVEL (GP) Fine to coarse, trace sand, poorly graded, loose, maximum particle size is 20 mm, rounded to subangular, no cementation, sand is coarse. Close to no matrix (visible void space), appears washed. [TILL]
2					SILT (ML) Gravelly, some sand, trace cobbles, trace clay, low to medium plasticity, stiff, brownish grey, dry to moist, homogeneous, strong cementation, high dry strength, no dilatancy, gravel is fine to coarse, maximum particle size is 200 mm, subangular, sand is fine. [TILL] Below 1.90 m - increase in cobble content.
3					
4		G2			SILT (ML) Sandy, some gravel, low plasticity, very stiff to hard, grey, moist, homogeneous, strong cementation, slow dilatancy, sand is fine, gravel is fine to coarse. Teeth of excavator cut "square" edges in this unit. [TILL] From 3.58 to 3.68 m - Particle Size Analysis: 17% gravel, 33% sand, 50% fines.
5					END OF HOLE AT 3.68 m Notes: 1. Final depth at maximum reach of excavator, due to topography of gully. 2. No groundwater seepage observed.
6					
7					
8					
9					
10					

Su - kPa: 40, 80, 120, 160

	FIELD	LAB	
VANE PEAK	◆	■	▲ UC/2
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content: W_P% × — ○ — × W_L%; W%: 20, 40, 60, 80

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Client: KGHM International Ltd.

Project: AJAX MEMA Support

TEST PIT # TP-BGC13-28

Location : EWRSA Dam

Project No. : 1125-003

Survey Method : HandHeld GPS
Co-ordinates (m): : 687,285E, 5,609,464N
Ground Elevation (m): 883
Datum : NAD83

Excavator : Hitachi, 200 LC
Operator : Grant, KIB

Start Date : 12 May 13
Finish Date : 12 May 13
Final Depth of Pit (m) : 4.32
Logged by : JW
Reviewed by : TWC

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					ORGANICS Gravelly, some sand, brown, no odour, dry, trace rootlets.
1		G1			GRAVEL and SAND (GP) Sand is medium to coarse, gravel is fine to coarse, some cobbles, gap graded, loose, rounded to subangular, maximum particle size is 180 mm, dry, no cementation. Appears washed. [FLUVIAL]
		G2			SAND (SP) Medium to coarse, some gravel, gap graded, loose, maximum particle size is 80 mm, subangular, no cementation, gravel is fine to coarse, rounded to subrounded, multi-lithic. [FLUVIAL]
2					SAND (SP) Very fine to medium, poorly graded, compact, light brown, moist, bedded, weak cementation.
3					SILT (ML) Sandy, trace gravel, low plasticity, stiff to very stiff, brown, homogeneous, strong cementation, slow to no dilatancy, sand is fine to medium, gravel is medium to coarse, maximum particle size is 50 mm, rounded to subangular. [LACUSTRINE]
4		G3			END OF HOLE AT 4.30 m
5					Notes: 1. Final depth due to unstable walls of test pit. 2. No groundwater seepage observed.
6					
7					
8					
9					
10					

Su - kPa
40 80 120 160
VANE FIELD LAB
PEAK ◆ ■
REMOLD ◇ □
▲ UC/2
△ Pocket Pen /2
★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

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Client: KGHM International Ltd.

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 9/26/13

Project: AJAX MEMA Support

TEST PIT # TP-BGC13-29

Location : EWRSA Dam

Project No. : 1125-003

Survey Method : Handheld GPS
Co-ordinates (m): : 687,560E, 5,609,574N
Ground Elevation (m): 875
Datum : NAD83

Excavator : Hitachi, 200 LC
Operator : Grant, KIB

Start Date : 12 May 13
Finish Date : 12 May 13
Final Depth of Pit (m) : 5.52
Logged by : JW
Reviewed by : TWC

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					SAND (SP) Fine, gravelly, gap graded, loose to compact, maximum particle size is 120 mm, subangular, dry, no cementation, trace rootlets, gravel is fine to coarse.
1		G1			GRAVEL (GP) Fine to coarse, sandy, gap graded, loose (unstable), maximum particle size is 80 mm, dry, no cementation, sand is medium to coarse. Appears washed. [FLUVIAL]
		G2			SAND (SP) Fine, trace silt, poorly graded, compact to dense, moist, weak cementation.
2					SAND and SILT (SM) Fine to medium, trace gravel, trace cobbles, poorly graded, dense, maximum particle size is 140 mm, light brown, moist, weak cementation, gravel is fine. From 1.32 to 1.42 m - Particle Size Analysis: 7% gravel, 56% sand, 37% fines.
3					Below 3.32 m - trace silt, colour change to medium brown, increase in moisture content. Same as sample G1 in TP-BGC13-30.
4					
5					
6					END OF HOLE AT 5.52 m Notes: 1. Final depth at maximum reach of excavator. 2. No groundwater seepage observed.
7					
8					
9					
10					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

○

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 9/26/13

BGC ENGINEERING INC.
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Client: KGHM International Ltd.

Project: AJAX MEMA Support

TEST PIT # TP-BGC13-30

Location : EWRSA Dam

Project No. : 1125-003

Survey Method : Handheld GPS
Co-ordinates (m): : 687,706E, 5,609,529N
Ground Elevation (m): 876
Datum : NAD83

Excavator : Hitachi, 200 LC
Operator : Grant, KIB

Start Date : 12 May 13
Finish Date : 12 May 13
Final Depth of Pit (m) : 5.69
Logged by : JW
Reviewed by : TWC

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					ORGANICS Sandy, fine, some gravel, medium to coarse, trace boulders, loose to compact, dry, trace rootlets, charcoal present (burnt tree bark).
1					SAND (SP) Fine to medium, trace silt, poorly graded, compact, dark 'tan' brown, moist, weak cementation.
2					SAND (SP) Fine to medium, trace gravel, poorly graded, dense, light brown, weak cementation, gravel is fine.
3					
4					
5		G1			Below 4.59 m - increase in silt content from none to trace, dark brown, increase in moisture content from dry to moist.
6					END OF HOLE AT 5.69 m Notes: 1. Final depth at maximum reach of excavator. 2. No groundwater seepage observed.
7					
8					
9					
10					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

Project: AJAX MEMA Support

TEST PIT # TP-BGC13-31

Location : EWRSA Dam

Project No. : 1125-003

Survey Method : Handheld GPS
Co-ordinates (m): : 687,646E, 5,609,617N
Ground Elevation (m): 878
Datum : NAD83

Excavator : Hitachi, 200 LC
Operator : Grant, KIB

Start Date : 12 May 13
Finish Date : 12 May 13
Final Depth of Pit (m) : 2.20
Logged by : JW
Reviewed by : TWC

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					SAND (SP) Fine to medium, some organics, poorly graded, loose, subangular, dry, no cementation, trace rootlets.
1		G1			SAND (SW) Medium to coarse, gravelly, some silt, trace cobbles, well graded, compact to dense, maximum particle size is 290 mm, subangular, brown, dry, no to weak cementation, gravel is fine to coarse, rounded to angular, silt has low plasticity, cobbles are rounded to angular. [TILL]
2		G2			SAND (SP) Fine to medium, some silt, trace gravel, poorly graded, very dense, dry, laminated, strong cementation, very high dry strength.
					END OF HOLE AT 2.20 m
3					Notes: 1. Final depth due to unstable excavator footing on steep side hill. 2. No groundwater seepage observed.
4					
5					
6					
7					
8					
9					
10					

Su - kPa

40 80 120 160

	VANE	FIELD	LAB	
PEAK		◆	■	▲ UC/2
REMOLD		◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content

W_P% W% W_L%

20 40 60 80

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 9/26/13

BGC ENGINEERING INC.
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Client: KGHM International Ltd.

Project: AJAX MEMA Support

TEST PIT # TP-BGC13-32

Location : EWRSA Dam

Project No. : 1125-003

Survey Method : Handheld GPS
Co-ordinates (m): : 687,635E, 5,609,500N
Ground Elevation (m): 877
Datum : NAD83

Excavator : Hitachi, 200 LC
Operator : Grant, KIB

Start Date : 12 May 13
Finish Date : 12 May 13
Final Depth of Pit (m) : 2.66
Logged by : JW
Reviewed by : TWC

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					ORGANICS Sandy, fine, dark brown, organic odour, dry, trace rootlets.
1		G1			SAND (SW) Fine to medium, gravelly, trace silt, trace cobbles, well graded, dense, maximum particle size is 270 mm, brown, moist, weak to moderate cementation, gravel is fine to coarse, subrounded to subangular. Clumps of very fine sand (30 to 40 mm diameter), loose, grey. [TILL] Below 0.66 m - change in colour to light brown.
2					
3					END OF HOLE AT 2.66 m Notes: 1. Refusal at 2.66 m on dense till and boulders. 2. No groundwater seepage observed.
4					
5					
6					
7					
8					
9					
10					

Su - kPa
40 80 120 160

VANE	FIELD	LAB	
PEAK	◆	■	▲ UC/2
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

△ 1.5

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 9/26/13

BGC ENGINEERING INC.
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Client: KGHM International Ltd.

Project: AJAX MEMA Support

TEST PIT # TP-BGC13-33

Location : EWRSA

Project No. : 1125-003

Survey Method : Handheld GPS
Co-ordinates (m): : 687,704E, 5,610,367N
Ground Elevation (m): 966
Datum : NAD83

Excavator : Hitachi, 200 LC
Operator : Grant, KIB

Start Date : 13 May 13
Finish Date : 13 May 13
Final Depth of Pit (m) : 3.90
Logged by : JW
Reviewed by : BMM

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					ORGANICS Sandy, some silt, trace gravel, dark brown, slight organic odour, dry, trace rootlets.
1		G1			SAND (SW) Fine to coarse, gravelly, trace silt, trace cobbles, well graded, dense, maximum particle size is 150 mm, subangular, brown, moist, weak cementation, gravel is fine to coarse, subrounded to subangular, silt in matrix is nonplastic. Clumps up to 40 mm in diameter of grey and green fine sand. [TILL]
2					SAND (SM) Fine to coarse, gravelly, some silt, trace cobbles, well graded, dense, maximum particle size is 230 mm, subangular, brown, moist, weak to moderate cementation, gravel is fine to coarse, subrounded to subangular, silt in matrix is nonplastic. [TILL]
3					
4					END OF HOLE AT 3.90 m Notes: 1. Refusal at 3.90 m on dense till. 2. No groundwater seepage observed.
5					
6					
7					
8					
9					
10					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines
Moisture Content
W_P% W% W_L%
20 40 60 80

△ 1.0

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 9/26/13

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: KGHM International Ltd.

Project: AJAX MEMA Support

TEST PIT # TP-BGC13-34

Location : EWRSA

Project No. : 1125-003

Survey Method : Handheld GPS
Co-ordinates (m): : 687,708E, 5,609,980N
Ground Elevation (m): 933
Datum : NAD83

Excavator : Hitachi, 200 LC
Operator : Grant, KIB

Start Date : 13 May 13
Finish Date : 13 May 13
Final Depth of Pit (m) : 2.62
Logged by : JW
Reviewed by : BMM

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					ORGANICS Sandy, trace gravel, dark brown, no odour, dry, trace rootlets. Sand content increases from some sand to sandy gradually with depth.
1					SAND (SW) Fine to coarse, gravelly, trace silt, trace cobbles, trace boulders, well graded, dense, maximum particle size is 700 mm, subangular, brown, moist, weak cementation, gravel is fine to coarse, subrounded to subangular. [TILL]
2					SAND and SILT (SM) Fine to medium, gravelly, gap graded, dense, maximum particle size is 60 mm, light brown, dry to moist, weak to moderate cementation, gravel is fine to coarse, subrounded. [TILL]
2.5		G1			From 2.50 to 2.60 m - Particle Size Analysis: 25% gravel, 35% sand, 40% fines.
3					END OF HOLE AT 2.62 m
4					Notes: 1. Refusal at 2.62 m on dense till. 2. No groundwater seepage observed. 3. Test pit located 3 m from drainage channel.
5					
6					
7					
8					
9					
10					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

△ (2.62 m)
○ (2.5 m)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: KGHM International Ltd.

AJAX (TESTPIT) AJAX_SOIL.GDL BGC.GDT 9/26/13

Project: AJAX MEMA Support

TEST PIT # TP-BGC13-35

Location : EWRSA

Project No. : 1125-003

Survey Method : Handheld GPS
Co-ordinates (m): : 686,861E, 5,610,691N
Ground Elevation (m): 959
Datum : NAD83

Excavator : Hitachi, 200 LC
Operator : Grant, KIB

Start Date : 13 May 13
Finish Date : 13 May 13
Final Depth of Pit (m) : 3.83
Logged by : JW
Reviewed by : BMM

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					ORGANICS Trace sand, fine, trace silt, trace gravel, dark brown, organic odour, moist.
1					SAND (SP) Medium to coarse, gravelly, gap graded, compact, maximum particle size is 40 mm, dark brown, organic odour, moist, homogeneous, some organic debris and trace rootlets, gravel is fine to coarse, subrounded to subangular. [TILL]
2					SAND (SW) Fine to coarse, gravelly, trace cobbles, well graded, dense, maximum particle size is 190 mm, subangular, brown, moist, homogeneous, no cementation, gravel is fine to coarse. [TILL]
2.5		G1			
3					SAND (SM) Fine to coarse, gravelly, silty, trace cobbles, dense, light brown, moist, homogeneous, weak to moderate cementation, gravel is fine to coarse, subrounded to subangular, surfaces of gravel and cobbles are oxidized, silt is low plasticity. [TILL] Below 2.70 m - darker brown, increase in moisture content.
4					END OF HOLE AT 3.83 m Notes: 1. Refusal at 3.83 m on dense till. 2. No groundwater seepage observed.
5					
6					
7					
8					
9					
10					

Su - kPa
40 80 120 160
VANE FIELD LAB
PEAK ◆ ■
REMOLD ◇ □
▲ UC/2
△ Pocket Pen /2
★ % Fines
Moisture Content
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: KGHM International Ltd.

Survey Method: Handheld GPS
Co-ordinates (m): 683,266E, 5,612,351N
Ground Elevation (m): 934
Datum: NAD83
Dip (degrees from horizontal): 90
Direction: n/a

Drill Designation: Fraste MD-XL
Drilling Contractor: Geotech Drilling
Drill Method: ODEX/Triple Tube
Core: HQ3
Fluid: Water
Casing: HWT **Cased To (m):** 16.18

Start Date: 29 Mar 13
Finish Date: 01 Apr 13
Final Depth of Hole (m): 25.30
Depth to Top of Rock (m): 16.18
Logged by: SLP
Reviewed by: BMM

Depth (m)	Sample Type	Sample No.	Lithologic Description	DCT Blows per 300mm	SPT Blows per 150mm
0		M1	ORGANICS Vegetation, grasses, trace rootlets < 1 mm diameter.		0 3 3
1			SAND (SW) Fine to coarse, some gravel, trace silt, well graded, loose, maximum particle size is 20 mm, flat, subrounded, greyish brown, no odour, moist to dry, homogeneous, no cementation, gravel is medium strong, fine to coarse, rounded. [TILL]		
2		M2			5 7 17
3		M3	SILT (MH) Clayey, some sand, some gravel, high plasticity, very stiff, medium brown, no odour, moist, homogeneous, no cementation. [TILL]		12 17 28
4			CLAY (CL) Silty, some gravel, very stiff, dark grey, no odour, moist, homogeneous, no cementation, slow dilatancy. [TILL]		
5		M4	CLAY (CI) Silty, sandy, some gravel, medium plasticity, very stiff, medium brown, no odour, moist, homogeneous, no cementation, slow dilatancy, gravel is flat, subangular, grey. [TILL]		5 12 17
6		M5	From 4.57 to 5.03 m - Particle Size Analysis: 12% gravel, 30% sand, 58% fines. At 5.18 m - sandy layer, loose, approximately 300 mm thick. At 6.10 m - sandy layer, loose, approximately 300 mm thick.		7 18 19
7			SILT (ML) Some sand, some clay, medium plasticity, very stiff, black, no odour, moist, homogeneous, no cementation, rapid dilatancy. [TILL]		
8		M6	SILT and CLAY (ML/CI) Some sand, poorly graded (uniform), very dense, dark grey to black, no odour, moist, homogeneous, no cementation, rapid dilatancy, sand is fine. [TILL]		8 14 17
9		M7	From 9.14 to 9.60 m - Particle Size Analysis: 0% gravel, 14% sand, 86% fines.		5 6 10
10					

Instrument Details

Su - kPa: 40, 80, 120, 160
VANE PEAK / REMOLD — FIELD ◆ ◇ — LAB ■ □
UC/2 ▲
Pocket Pen /2 △
DCT (blows/300mm)
SPT (blows/300mm) ●
★ % Fines
Hydraulic Conductivity (m/sec) 10^{-8} 10^{-6} 10^{-4} 10^{-2}
Core Recovery: 20, 40, 60, 80
Moisture Content & SPT N — W_P% W% W_L%: 20, 40, 60, 80

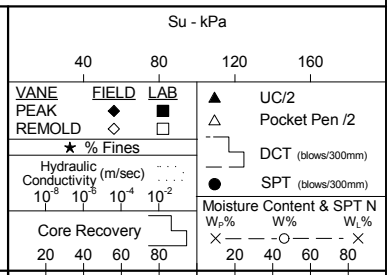
(Continued on next page)

Survey Method: Handheld GPS
Co-ordinates (m): 683,266E, 5,612,351N
Ground Elevation (m): 934
Datum: NAD83
Dip (degrees from horizontal): 90
Direction: n/a

Drill Designation: Fraste MD-XL
Drilling Contractor: Geotech Drilling
Drill Method: ODEX/Triple Tube
Core: HQ3
Fluid: Water
Casing: HWT **Cased To (m):** 16.18

Start Date: 29 Mar 13
Finish Date: 01 Apr 13
Final Depth of Hole (m): 25.30
Depth to Top of Rock (m): 16.18
Logged by: SLP
Reviewed by: BMM

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details	DCT Blows per 300mm	SPT Blows per 150mm
10							
11		M8		At 10.66 m - SPT N values uncertain due to drilling pressurizing the hole. Material heaving into the hole. At 10.67 m - water encountered.			1 2 2
12		M9		GRAVEL (GP) Fine to coarse, some sand, poorly graded, maximum particle size is 25 mm, flat and elongated, angular, dark grey, no odour, wet, homogeneous, multi-lithic. [TILL]			5 9 7
13							
14		M10		From 14.18 m to 14.63 m - no recovery.			6 10 19
15							
16				Rock encountered at 16.18 m depth. See BGC13-001 rock log.			
17							
18							
19							
20							



BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: KGHM International Ltd.

AJAX (SOIL) AJAX_SOIL.GDL BGC.GDT 9/26/13

Survey Method :Handheld GPS
Co-ordinates (m) : 683,266E, 5,612,351N
Ground Elevation (m) : 934
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste MD-XL
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/Triple Tube
Core : HQ3
Fluid : Water
Casing : HWT **Cased To (m)** : 16.18

Start Date : 29 Mar 13
Finish Date : 01 Apr 13
Final Depth of Hole (m) : 25.30
Depth to Top of Rock (m) : 16.18
Logged by : SLP
Reviewed by : BMM

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description	Instrument Details
10					0 to 16.18 m - See BGC13-001 soil log.	
16			3		BEDROCK Brownish reddish grey, fine grained, porphyritic, weak to medium strong (R2-R3), moderately weathered (W3), discontinuities at 25° and 75° to core axis, with intense iron oxidation. [SUGARLOAF DIORITE]	
18			3			
19					Below 19.20 m - large green clasts present, discontinuities at 35° to 80° to core axis.	
20						

Hydraulic Conductivity m/sec: 10^{-8} 10^{-6} 10^{-4} 10^{-2}
Core Recovery %
RQD %: 20 40 60 80
UCS - MPa: 50 100 150 200
Point Load
Triaxial
RMR: 20 40 60 80

(Continued on next page)

Survey Method :Handheld GPS
Co-ordinates (m) : 683,266E, 5,612,351N
Ground Elevation (m) : 934
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste MD-XL
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/Triple Tube
Core : HQ3
Fluid : Water
Casing : HWT **Cased To (m)** : 16.18

Start Date : 29 Mar 13
Finish Date : 01 Apr 13
Final Depth of Hole (m) : 25.30
Depth to Top of Rock (m) : 16.18
Logged by : SLP
Reviewed by : BMM

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
20			3		
21			3		Below 20.73 m - large green clasts up to 50 mm in size present. At 21.55 m - minor fault along a vein, 50 mm thickness, quartz and silty, clayey infill, brownish red infill, quartz veins approximately 2 mm thick continue to the end of the hole.
22					From 22.25 m to 25.30 m - slightly to moderately weathered (W2-W3).
23			2.5		
24			2.5		
25					END OF HOLE AT 25.30 m Notes: 1. 2.5" PVC standpipe piezometer installed with screen from 9.75 to 13.18 m. 2. Filter sand placed from 9.17 to 13.18 m. 3. Bentonite seal placed from 7.82 to 9.17 m and hydrated with water. 4. Water level measured on April 17, 2013: -0.05 m below ground surface. 5. SPT hammer type: Automatic trip, 140 lbs. N values shown are uncorrected.
26					
27					
28					
29					
30					

Instrument Details

Hydraulic Conductivity m/sec
10^{-8} 10^{-6} 10^{-4} 10^{-2}

Core Recovery %

RQD %
20 40 60 80

UCS - MPa
50 100 150 200
■ Point Load
◇ Triaxial

RMR
20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: KGHM International Ltd.

Survey Method: Handheld GPS
Co-ordinates (m): 683,381E, 5,612,048N
Ground Elevation (m): 955
Datum: NAD83
Dip (degrees from horizontal): 90
Direction: n/a

Drill Designation: Fraste MD-XL
Drilling Contractor: Geotech Drilling
Drill Method: ODEX/Triple Tube
Core: HQ3
Fluid: Water
Casing: HWT **Cased To (m):** 24.38

Start Date: 01 Apr 13
Finish Date: 02 Apr 13
Final Depth of Hole (m): 34.14
Depth to Top of Rock (m): 23.77
Logged by: SLP
Reviewed by: BMM

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description
0		M1		ORGANICS Vegetation, grasses, trace rootlets < 1 mm diameter.
				GRAVEL (GM) Fine to coarse, sandy, some silt, trace clay, well graded, dense, maximum particle size is 25 mm, flat, subrounded, greyish brown, no odour, moist, homogeneous, no cementation. [TILL]
1				
2		M2		
3		M3		SAND (SM) Fine to medium, gravelly, some silt, trace clay, well graded, dense, maximum particle size is 50 mm, flat and elongated, subrounded, greyish brown with iron oxide staining in sand/silt matrix, no odour, moist, homogeneous, no cementation, trace rootlets < 1 mm diameter, gravel is fine to coarse, multi-lithic. [TILL]
4				
5		M4		Below 4.57 m - compact to dense. At 4.77 m - silty clayey pocket, approximately 30 mm thick, light greyish green, medium plasticity, slow to rapid dilatancy.
6				
7		M5		From 6.10 m - fines content increases. Below 6.10 m - trace to some clay, dense, brown to dark brown, pockets of green clay, medium plasticity.
8		M6		Below 7.62 m - some clay, compact, dark greyish brown.
9				
10		M7		Below 9.14 m - dense, greyish brown.

Instrument Details

DCT Blows per 300mm

SPT Blows per 150mm: 3, 4, 9 | 12, 21, 23 | 13, 13, 24 | 9, 13, 17 | 8, 15, 16 | 7, 12, 16 | 6, 13, 24

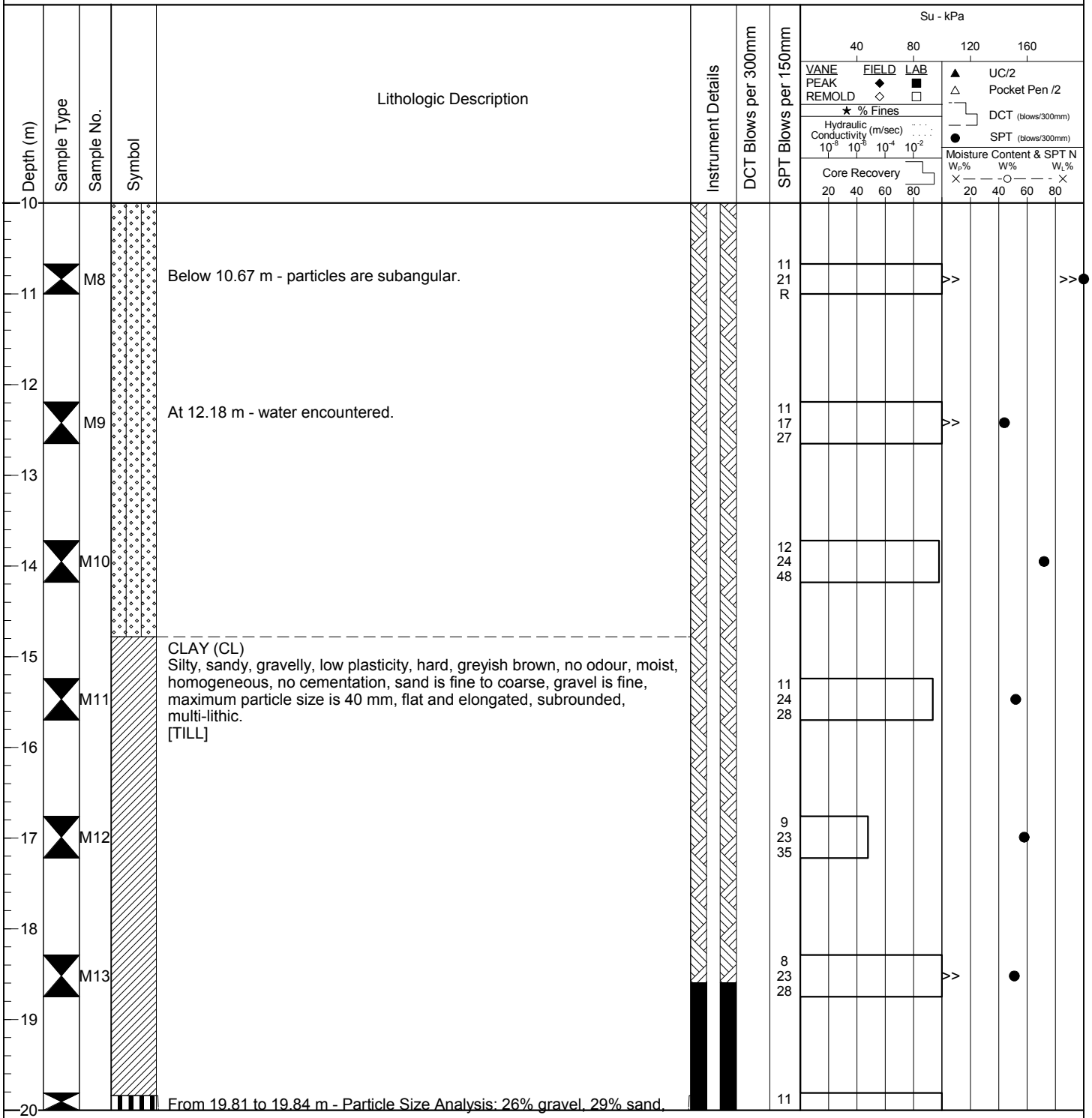
Su - kPa (40, 80, 120, 160)
VANE PEAK REMOLD — FIELD ◆ ◇ — LAB ■ □
UC/2 ▲
Pocket Pen /2 △
DCT (blows/300mm)
SPT (blows/300mm) ●
★ % Fines
Hydraulic Conductivity (m/sec) 10^{-8} 10^{-6} 10^{-4} 10^{-2}
Core Recovery 20 40 60 80
Moisture Content & SPT N
W_P% W% W_L% 20 40 60 80

(Continued on next page)

Survey Method: Handheld GPS
Co-ordinates (m): 683,381E, 5,612,048N
Ground Elevation (m): 955
Datum: NAD83
Dip (degrees from horizontal): 90
Direction: n/a

Drill Designation: Fraste MD-XL
Drilling Contractor: Geotech Drilling
Drill Method: ODEX/Triple Tube
Core: HQ3
Fluid: Water
Casing: HWT **Cased To (m):** 24.38

Start Date: 01 Apr 13
Finish Date: 02 Apr 13
Final Depth of Hole (m): 34.14
Depth to Top of Rock (m): 23.77
Logged by: SLP
Reviewed by: BMM



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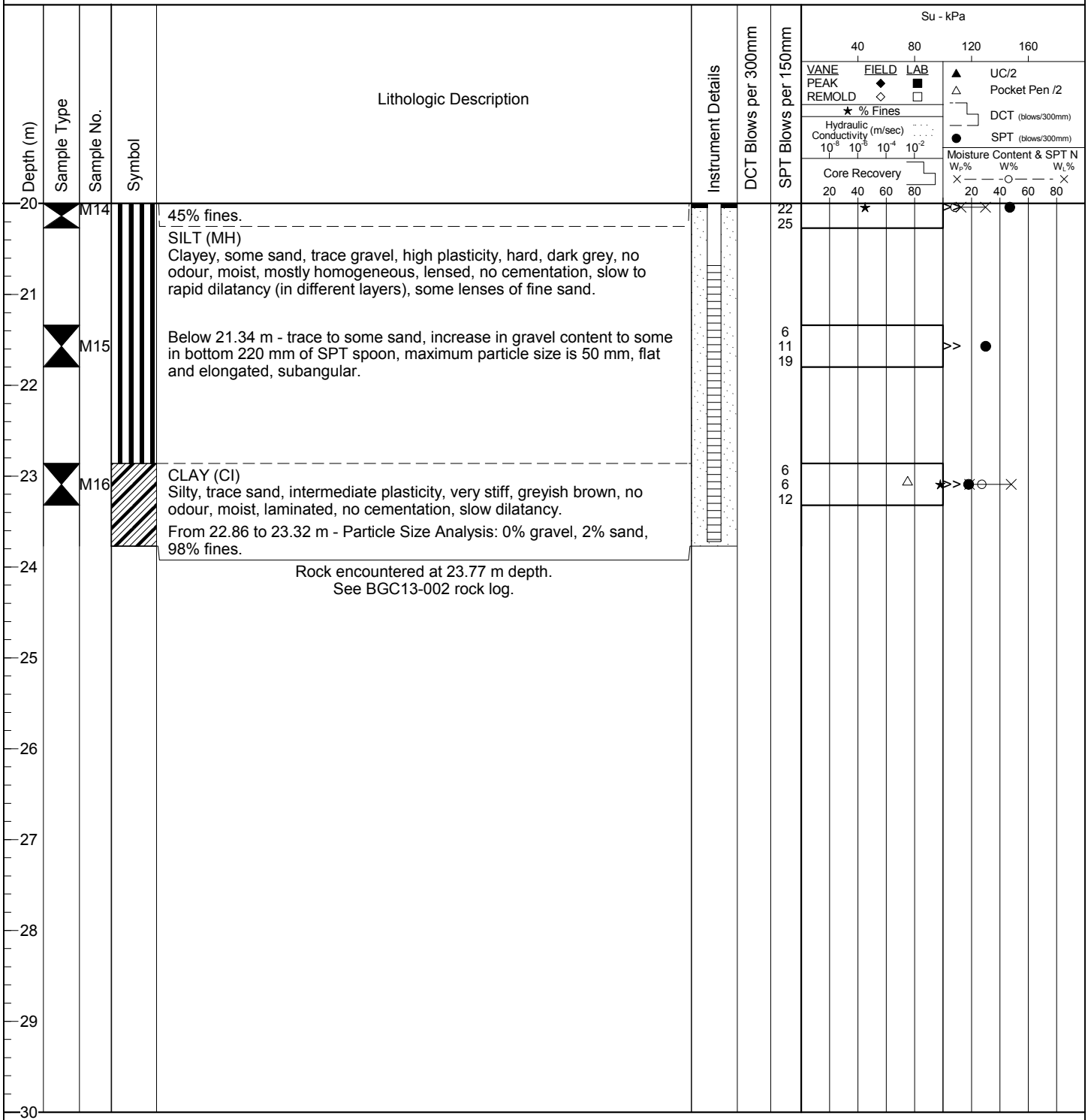
Survey Method: Handheld GPS
Co-ordinates (m): 683,381E, 5,612,048N
Ground Elevation (m): 955
Datum: NAD83
Dip (degrees from horizontal): 90
Direction: n/a

Drill Designation: Fraste MD-XL
Drilling Contractor: Geotech Drilling
Drill Method: ODEX/Triple Tube
Core: HQ3
Fluid: Water
Casing: HWT **Cased To (m):** 24.38

Start Date: 01 Apr 13
Finish Date: 02 Apr 13
Final Depth of Hole (m): 34.14
Depth to Top of Rock (m): 23.77
Logged by: SLP
Reviewed by: BMM



Survey Method :Handheld GPS
Co-ordinates (m) : 683,381E, 5,612,048N
Ground Elevation (m) : 955
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste MD-XL
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/Triple Tube
Core : HQ3
Fluid : Water
Casing : HWT **Cased To (m)** : 24.38

Start Date : 01 Apr 13
Finish Date : 02 Apr 13
Final Depth of Hole (m) : 34.14
Depth to Top of Rock (m) : 23.77
Logged by : SLP
Reviewed by : BMM

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
20–23					0 to 23.77 m - See BGC13-002 soil log.
24					BEDROCK Dark green, fine grained, foliated, porphyritic, weak to medium strong (R2-R3), slightly to moderately weathered (W2-W3), discontinuities at 10° to 55° to core axis, quartz veining throughout. [SUGARLOAF DIORITE] From 24.38 to 25.88 m - highly weathered (W4), clay infill.
24–25		M17	4		From 24.38 to 24.84 m - SPT M17; N = refusal, recovery = 0.18 m.
25			4		
25–26			2.5		From 25.88 to 34.14 m - light purplish grey, brecciated texture.
26			3		
26–27			2		
27–28			2		Below 28.04 m - discontinuities at 15° to 65° to core axis.
28–29			2		At 28.49 m - joint along quartz vein, 15° to core axis, vein is 15 mm thick, joint surface is oxidized.
29–30					From 29.57 to 34.14 m - fresh to slightly weathered (W1-W2).

Instrument Details

Hydraulic Conductivity m/sec: 10^{-8} 10^{-6} 10^{-4} 10^{-2}

Core Recovery %

RQD %: 20 40 60 80

UCS - MPa: 50 100 150 200

■ Point Load
◇ Triaxial

RMR: 20 40 60 80

(Continued on next page)

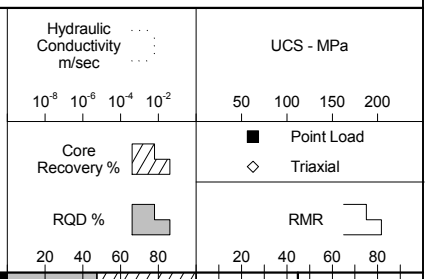
Survey Method :Handheld GPS
Co-ordinates (m) : 683,381E, 5,612,048N
Ground Elevation (m) : 955
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste MD-XL
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/Triple Tube
Core : HQ3
Fluid : Water
Casing : HWT **Cased To (m)** : 24.38

Start Date : 01 Apr 13
Finish Date : 02 Apr 13
Final Depth of Hole (m) : 34.14
Depth to Top of Rock (m) : 23.77
Logged by : SLP
Reviewed by : BMM

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
30			1.5		From 32.41 m to 34.14 m - minor fault, 30 mm clay, calcite infill, firm.
31			2		
32					
33			1.5		
34					END OF HOLE AT 34.14 m Notes: 1. 2.5" PVC standpipe piezometer installed with screen from 20.68 to 23.72 m. 2. Filter sand placed from 20.04 to 24.38 m. 3. Bentonite seal placed from 18.59 to 20.04 m and hydrated with water. 4. Water level measured on April 17, 2013: 9.84 m below ground surface. 5. SPT hammer type: Automatic trip, 140 lbs. N values shown are uncorrected.
35					
36					
37					
38					
39					
40					

Instrument Details



Project: AJAX MEMA Support

DRILL HOLE # BGC13-003

Location: NWRSA

Project No. : 1125-003

Survey Method: Handheld GPS
Co-ordinates (m): 683,382E, 5,611,693N
Ground Elevation (m): 952
Datum: NAD83
Dip (degrees from horizontal): 90
Direction: n/a

Drill Designation: Fraste MD-XL
Drilling Contractor: Geotech Drilling
Drill Method: ODEX/Triple Tube
Core: HQ3
Fluid: Water
Casing: HWT **Cased To (m):** 7.62

Start Date: 03 Apr 13
Finish Date: 04 Apr 13
Final Depth of Hole (m): 15.85
Depth to Top of Rock (m): 6.70
Logged by: SLP
Reviewed by: BMM

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details	DCT Blows per 300mm	SPT Blows per 150mm
0							
		M1		ORGANICS Grasses, trace rootlets < 1 mm to 2 mm diameter, organic odour.			1 3 3
1				SAND (SW) Fine, gravelly, some silt, trace clay, well graded, dense, maximum particle size is 35 mm, elongated, subrounded, brownish grey, no odour, dry, homogeneous, no cementation. [TILL]			
		M2					18 24 23
2							
3		M3					11 17 19
4							
		M4					10 14 19
5							
6		M5		CLAY (CI) Silty, trace sand, trace to some gravel, medium plasticity, stiff, greyish brown, no odour, dry to moist, laminated, no cementation, slow dilatancy.			5 7 R
				Rock encountered at 6.70 m depth. See BGC13-003 rock log.			
7							
8							
9							
10							

Su - kPa
40 80 120 160
VANE FIELD LAB
PEAK ◆ ■
REMOLD ◇ □
▲ UC/2
△ Pocket Pen /2
★ % Fines
Hydraulic Conductivity (m/sec) 10^{-8} 10^{-6} 10^{-4} 10^{-2}
DCT (blows/300mm)
● SPT (blows/300mm)
Core Recovery
20 40 60 80
Moisture Content & SPT N
W_P% W% W_L%
20 40 60 80

AJAX (SOIL) AJAX_SOIL.GDL BGC.GDT 9/26/13

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: KGHM International Ltd.

Survey Method :Handheld GPS
Co-ordinates (m) : 683,382E, 5,611,693N
Ground Elevation (m) : 952
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste MD-XL
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/Triple Tube
Core : HQ3
Fluid : Water
Casing : HWT **Cased To (m)** : 7.62

Start Date : 03 Apr 13
Finish Date : 04 Apr 13
Final Depth of Hole (m) : 15.85
Depth to Top of Rock (m) : 6.70
Logged by : SLP
Reviewed by : BMM

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description	Instrument Details
0					0 to 6.70 m - See BGC13-003 soil log.	
7					BEDROCK Light grey, fine grained, microfractured, very weak to weak (R1-R2), moderately weathered (W3), discontinuities at 22° to core axis. [SUGARLOAF DIORITE]	
8			3			
9			2		Below 8.23 m - slightly darker grey, increased alteration (quartz), weak (R2), slightly weathered (W2), discontinuities at 42° to 65° to core axis.	
10					Below 9.75 m - colour change to light green, discontinuities at 15° to	

Hydraulic Conductivity m/sec: 10^{-8} 10^{-6} 10^{-4} 10^{-2}
Core Recovery %
RQD %: 20 40 60 80

UCS - MPa: 50 100 150 200
Point Load
Triaxial
RMR: 20 40 60 80

(Continued on next page)

Survey Method :Handheld GPS
Co-ordinates (m) : 683,382E, 5,611,693N
Ground Elevation (m) : 952
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste MD-XL
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/Triple Tube
Core : HQ3
Fluid : Water
Casing : HWT **Cased To (m)** : 7.62

Start Date : 03 Apr 13
Finish Date : 04 Apr 13
Final Depth of Hole (m) : 15.85
Depth to Top of Rock (m) : 6.70
Logged by : SLP
Reviewed by : BMM

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
10			2		52° to core axis (average JRC = 2).
11			1.5		From 11.28 m to 15.85 m - fresh and unweathered to slightly weathered (W1-W2). Below 11.28 m - microfractured, discontinuities at 28° to 45° to core axis, JRC = 2-6, shallow (28° to core axis) minor fault, broken rock, crushed rock, calcite and gouge infill, clayey.
12			1.5		Below 12.8 m - stockwork, discontinuities at 36° to 60° to core axis.
13			1.5		Below 14.33 m - darker green, stockwork, discontinuities at 27° to 40° to core axis.
14					END OF HOLE AT 15.85 m
15					Notes: 1. 2.5" PVC standpipe piezometer installed with screen from 6.45 to 15.60 m. 2. Filter sand placed from 5.79 to 15.85 m. 3. Bentonite seal placed from 4.26 to 5.79 m and hydrated with water. 4. Water level measured on April 17, 2013: 7.85 m below ground surface. 5. SPT hammer type: Automatic trip, 140 lbs. N values shown are uncorrected.
16					
17					
18					
19					
20					

Instrument Details

Hydraulic Conductivity m/sec
10^{-8} 10^{-6} 10^{-4} 10^{-2}

Core Recovery %

RQD %
20 40 60 80

UCS - MPa
50 100 150 200
■ Point Load
◇ Triaxial

RMR
20 40 60 80

Project: AJAX MEMA Support

DRILL HOLE # BGC13-004

Location: Ore Stockpile

Project No. : 1125-003

Survey Method: Handheld GPS
Co-ordinates (m): 683,599E, 5,612,087N
Ground Elevation (m): 958
Datum: NAD83
Dip (degrees from horizontal): 90
Direction: n/a

Drill Designation: Fraste MD-XL
Drilling Contractor: Geotech Drilling
Drill Method: ODEX/Triple Tube
Core: HQ3
Fluid: Water
Casing: HWT **Cased To (m):** 3.04

Start Date: 05 Apr 13
Finish Date: 05 Apr 13
Final Depth of Hole (m): 13.11
Depth to Top of Rock (m): 0.91
Logged by: SLP
Reviewed by: BMM

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details	DCT Blows per 300mm	SPT Blows per 150mm
0		M1		ORGANICS Vegetation, grasses, trace rootlets < 1 mm diameter.			1 2 4
1				SILT (ML) Organic silt, sandy, trace gravel, trace clay, no plasticity, dark brown, organic odour, moist, homogeneous, no cementation, rapid dilatancy, gravel is fine, maximum particle size is 6 mm. [TILL]			
				Rock encountered at 0.91 m depth. See BGC13-004 rock log.			
2							
3							
4							
5							
6							
7							
8							
9							
10							

Su - kPa
40 80 120 160
VANE FIELD LAB
PEAK ◆ ■
REMOLD ◇ □
▲ UC/2
△ Pocket Pen /2
★ % Fines
Hydraulic Conductivity (m/sec)
10^{-8} 10^{-6} 10^{-4} 10^{-2}
DCT (blows/300mm)
● SPT (blows/300mm)
Core Recovery
20 40 60 80
Moisture Content & SPT N
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: KGHM International Ltd.

AJAX (SOIL) AJAX_SOIL.GDL BGC.GDT 9/26/13

Survey Method :Handheld GPS
Co-ordinates (m) : 683,599E, 5,612,087N
Ground Elevation (m) : 958
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste MD-XL
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/Triple Tube
Core : HQ3
Fluid : Water
Casing : HWT **Cased To (m)** : 3.04

Start Date : 05 Apr 13
Finish Date : 05 Apr 13
Final Depth of Hole (m) : 13.11
Depth to Top of Rock (m) : 0.91
Logged by : SLP
Reviewed by : BMM

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					0 to 0.91 m - See BGC13-004 soil log.
1		M2			From 0.91 to 1.37 m - SPT M2; N = refusal, recovery = 0.0 m. BEDROCK Light brown, orangish, medium to coarse grained, uniform, medium strong (R3), moderately weathered (W3), average joint condition is 16. [SUGARLOAF DIORITE]
3			2.5		Below 3.05 m - discontinuities at 34° to 75° to core axis, with iron oxidation, average JRC = 12, strong (R4), slightly to moderately weathered (W2-W3).
4			3		Below 3.96 m - light grey, fine grained, microfractured fabric, discontinuities at 11° to 90° to core axis, heavy iron oxidation, soft discontinuity walls, medium strong (R3), moderately weathered (W3).
6			2.5		Below 5.49 m - discontinuities at 15° to 60° to core axis, some iron oxidation, soft discontinuity walls, clay infill.
7			2.5		Below 7.01 m - discontinuities at 28° to 45° to core axis, less intense iron oxidation.
9			2		Below 8.53 m - microfractured with intense quartz veining, (< 2 mm thickness), discontinuities at 20° to 60° to core axis, weak to medium strong (R2-R3), slightly weathered (W3).
10					

Instrument Details

Hydraulic Conductivity m/sec: 10^{-8} 10^{-6} 10^{-4} 10^{-2}
Core Recovery %
RQD %: 20 40 60 80

UCS - MPa: 50 100 150 200
Point Load
Triaxial
RMR: 20 40 60 80

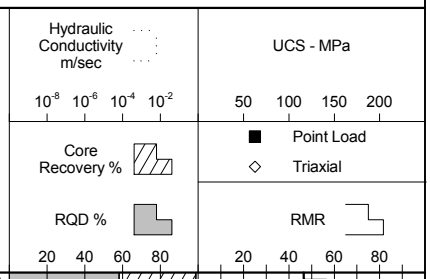
(Continued on next page)

Survey Method :Handheld GPS
Co-ordinates (m) : 683,599E, 5,612,087N
Ground Elevation (m) : 958
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste MD-XL
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/Triple Tube
Core : HQ3
Fluid : Water
Casing : HWT **Cased To (m)** : 3.04

Start Date : 05 Apr 13
Finish Date : 05 Apr 13
Final Depth of Hole (m) : 13.11
Depth to Top of Rock (m) : 0.91
Logged by : SLP
Reviewed by : BMM

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description	Instrument Details
10			2		Below 10.06 m - fine grained, discontinuities at 20° to 60° to core axis, quartz alteration, calcite infill, weak to medium strong (R2-R3), slightly weathered (W2).	
11						
12			2		Below 11.58 m - dark green, medium grained, stockwork, discontinuities at 22° to 52° to core axis, calcite infill, medium strong (R3), slightly weathered (W2).	
13					END OF HOLE AT 13.11 m Notes: 1. 2.5" PVC standpipe piezometer installed with screen from 6.93 to 13.03 m. 2. Filter sand placed from 2.87 to 13.11 m. 3. Bentonite seal placed from 1.52 to 2.87 m and hydrated with water. 4. Water level measured on April 17, 2013: 2.38 m below ground surface. 5. SPT hammer type: Automatic trip, 140 lbs. N values shown are uncorrected.	
14						
15						
16						
17						
18						
19						
20						



BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: KGHM International Ltd.

Survey Method: Handheld GPS
Co-ordinates (m): 683,644E, 5,611,699N
Ground Elevation (m): 953
Datum: NAD83
Dip (degrees from horizontal): 90
Direction: n/a

Drill Designation: Fraste MD-XL
Drilling Contractor: Geotech Drilling
Drill Method: ODEX/Triple Tube
Core: HQ3
Fluid: Water
Casing: HWT **Cased To (m):** 19.81

Start Date: 05 Apr 13
Finish Date: 08 Apr 13
Final Depth of Hole (m): 29.57
Depth to Top of Rock (m): 19.51
Logged by: SLP
Reviewed by: BMM

Depth (m)	Sample Type	Sample No.	Lithologic Description	SPT Blows per 150mm
0		M1	ORGANICS Organic silt, grasses, trace rootlets < 1 mm diameter.	2 5 5
1			SILT (ML) Sandy, trace gravel, trace clay, medium plasticity, stiff, light brown, no odour, moist, homogeneous, no cementation, rapid dilatancy. [TILL]	
2		M2	SAND (SM) Fine, gravelly, some silt, trace clay, well graded, compact, maximum particle size is 40 mm, subrounded, flat and elongated, light brown, no odour, dry, homogeneous, no cementation. [TILL]	12 13 14
3		M3	Below 3.05 m - trace to some clay.	9 12 19
4				
5		M4	Below 4.57 m - clayey, compact.	10 13 10
6				
7		M5	Below 6.10 m - dense.	10 18 22
8		M6	Below 7.62 m - decreasing gravel content to some, compact, moist.	8 9 13
9				
10		M7	CLAY (CL) Silty, sandy, trace gravel, low plasticity, very stiff, grey, no odour, moist, homogeneous, slow to rapid dilatancy, gravel is subrounded, elongated. [TILL]	5 11 12

Instrument Details

DCT Blows per 300mm

Su - kPa: 40, 80, 120, 160
VANE FIELD LAB
PEAK ◆ ■
REMOLD ◇ □
★ % Fines
Hydraulic Conductivity (m/sec) 10^{-8} 10^{-6} 10^{-4} 10^{-2}
Core Recovery: 20, 40, 60, 80
▲ UC/2
△ Pocket Pen /2
DCT (blows/300mm)
● SPT (blows/300mm)
Moisture Content & SPT N
W_P% W% W_L%: 20, 40, 60, 80

(Continued on next page)

Survey Method: Handheld GPS
Co-ordinates (m): 683,644E, 5,611,699N
Ground Elevation (m): 953
Datum: NAD83
Dip (degrees from horizontal): 90
Direction: n/a

Drill Designation: Fraste MD-XL
Drilling Contractor: Geotech Drilling
Drill Method: ODEX/Triple Tube
Core: HQ3
Fluid: Water
Casing: HWT **Cased To (m):** 19.81

Start Date: 05 Apr 13
Finish Date: 08 Apr 13
Final Depth of Hole (m): 29.57
Depth to Top of Rock (m): 19.51
Logged by: SLP
Reviewed by: BMM

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details	DCT Blows per 300mm	SPT Blows per 150mm
10							
11		M8		From 10.67 to 11.23 m - Particle Size Analysis: 8% gravel, 23% sand, 69% fines. Below 10.67 m - some clay to clayey, trace sand, slow dilatancy, gravel is flat, subrounded.			14 9 10
12							
		M9		Below 12.19 m - trace to some gravel, elongated, wet.			6 11 12
13							
14		M10		Below 13.72 m - sandy, some gravel, greyish brown, moist. From 13.77 to 14.18 m - Particle Size Analysis: 16% gravel, 33% sand, 51% fines.			4 9 9
15							
		M11		Below 15.24 m - very stiff to hard.			7 12 18
16							
17		M12					9 16 20
18							
		M13					7 16 21
19							
20				Rock encountered at 19.51 m depth. See BGC13-005 rock log.			

Su - kPa: 40, 80, 120, 160
VANE PEAK / FIELD ◆ / LAB ■ / REMOLD ◇ □
▲ UC/2
△ Pocket Pen /2
★ % Fines
DCT (blows/300mm)
● SPT (blows/300mm)
Hydraulic Conductivity (m/sec) 10^{-8} 10^{-6} 10^{-4} 10^{-2}
Core Recovery 20 40 60 80
Moisture Content & SPT N: W_P% W% W_L% 20 40 60 80

Survey Method :Handheld GPS
Co-ordinates (m) : 683,644E, 5,611,699N
Ground Elevation (m) : 953
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste MD-XL
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/Triple Tube
Core : HQ3
Fluid : Water
Casing : HWT **Cased To (m)** : 19.81

Start Date : 05 Apr 13
Finish Date : 08 Apr 13
Final Depth of Hole (m) : 29.57
Depth to Top of Rock (m) : 19.51
Logged by : SLP
Reviewed by : BMM

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description	Instrument Details	Hydraulic Conductivity m/sec (10^{-8} 10^{-6} 10^{-4} 10^{-2}) / Core Recovery % / RQD % (20 40 60 80)	UCS - MPa (50 100 150 200) ■ Point Load ◇ Triaxial / RMR (20 40 60 80)
10					0 to 19.51 m - See BGC13-005 soil log.			
11								
12								
13								
14								
15								
16								
17								
18								
19								
20					BEDROCK Fine to medium grained, microfractured, medium strong (R3), slightly			

(Continued on next page)

Survey Method :Handheld GPS
Co-ordinates (m) : 683,644E, 5,611,699N
Ground Elevation (m) : 953
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste MD-XL
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/Triple Tube
Core : HQ3
Fluid : Water
Casing : HWT **Cased To (m)** : 19.81

Start Date : 05 Apr 13
Finish Date : 08 Apr 13
Final Depth of Hole (m) : 29.57
Depth to Top of Rock (m) : 19.51
Logged by : SLP
Reviewed by : BMM

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
20		M14	3		weathered (W2). [CHERRY CREEK UNIT] From 19.81 to 20.27 m - SPT M14; N = refusal, recovery = 0.08 m. From 20.42 m to 20.91 m - fault zone, dark brown to purplish red, fine to medium grained, mircofractured fabric, clay, decomposed and crushed rock infill, footwall at 57° to core axis, hanging wall at 42° to core axis, very weak (R1), highly weathered (W4).
			4		
21			2		
22			2		Below 21.95 m - discontinuities at 35° to 58° to core axis, calcite infill.
23					
24			2		Below 23.47 m - discontinuities at 30° to 65° to core axis, calcite infill, JRC = 4-20.
25					Below 24.99 m - highly fractured, quartz veining (1 mm thickness), discontinuities at 45° to core axis, JRC = 8-20.
26					
27			2		Below 26.52 m - JRC = 2-16.
28					
29			2		From 28.73 to 29.03 m - fault zone, discontinuities at 40° to 60° to core axis, decomposed rock, clay and sand infill.
					END OF HOLE AT 29.57 m
30					

Instrument Details

Hydraulic Conductivity m/sec: 10^{-8} 10^{-6} 10^{-4} 10^{-2}

Core Recovery %

RQD %: 20 40 60 80

UCS - MPa: 50 100 150 200

Point Load

Triaxial

RMR: 20 40 60 80

(Continued on next page)

Survey Method :Handheld GPS
Co-ordinates (m) : 683,644E, 5,611,699N
Ground Elevation (m) : 953
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste MD-XL
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/Triple Tube
Core : HQ3
Fluid : Water
Casing : HWT **Cased To (m)** : 19.81

Start Date : 05 Apr 13
Finish Date : 08 Apr 13
Final Depth of Hole (m) : 29.57
Depth to Top of Rock (m) : 19.51
Logged by : SLP
Reviewed by : BMM

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description	Instrument Details
30					Notes: 1. 2.5" PVC standpipe piezometer installed with screen from 25.45 to 28.50 m. 2. Filter sand placed from 19.25 to 29.57 m. 3. Bentonite seal placed from 17.68 to 19.25 m and hydrated with water. 2. Water level measured on April 17, 2013: 1.55 m below ground surface. 3. SPT hammer type: Automatic trip, 140 lbs. N values shown are uncorrected.	
31						
32						
33						
34						
35						
36						
37						
38						
39						
40						

Hydraulic Conductivity m/sec: 10^{-8} 10^{-6} 10^{-4} 10^{-2}
Core Recovery %
RQD %: 20 40 60 80
UCS - MPa: 50 100 150 200
Point Load
Triaxial
RMR: 20 40 60 80

Survey Method: Handheld GPS
Co-ordinates (m): 686,890E, 5,610,683N
Ground Elevation (m): 924
Datum: NAD83
Dip (degrees from horizontal): 90
Direction: n/a

Drill Designation: Fraste MD-XL
Drilling Contractor: Geotech Drilling
Drill Method: ODEX/Triple Tube
Core: HQ3
Fluid: Water
Casing: HWT **Cased To (m):** 24.38

Start Date: 09 Apr 13
Finish Date: 11 Apr 13
Final Depth of Hole (m): 34.44
Depth to Top of Rock (m): 23.16
Logged by: SLP
Reviewed by: BMM

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details	DCT Blows per 300mm	SPT Blows per 150mm
0		M1		ORGANICS Vegetation, grasses, trace rootlets < 1 mm diameter.			3 7 33
				SAND (SW) Fine, gravelly, some silt, trace clay, well graded, compact, maximum particle size is 40 mm, flat, subrounded, light brown, no odour, dry, homogeneous, no cementation, multi-lithic gravel. [TILL]			
1							
2		M2					10 7 10
3		M3		Below 3.05 m - dense, subangular, moist.			11 16 19
4							
5		M4		SILT (ML) Gravelly, some clay, trace sand, low plasticity, hard, light brown, no odour, moist to dry, no cementation, rapid dilatancy. [TILL]			15 21 33
6							
7							
8		M5		Below 7.62 m - some sand, very stiff, grey, moist.			11 11 15
9							
10		M6		From 9.14 m to 9.60 m - low recovery of SPT.			9 23 17

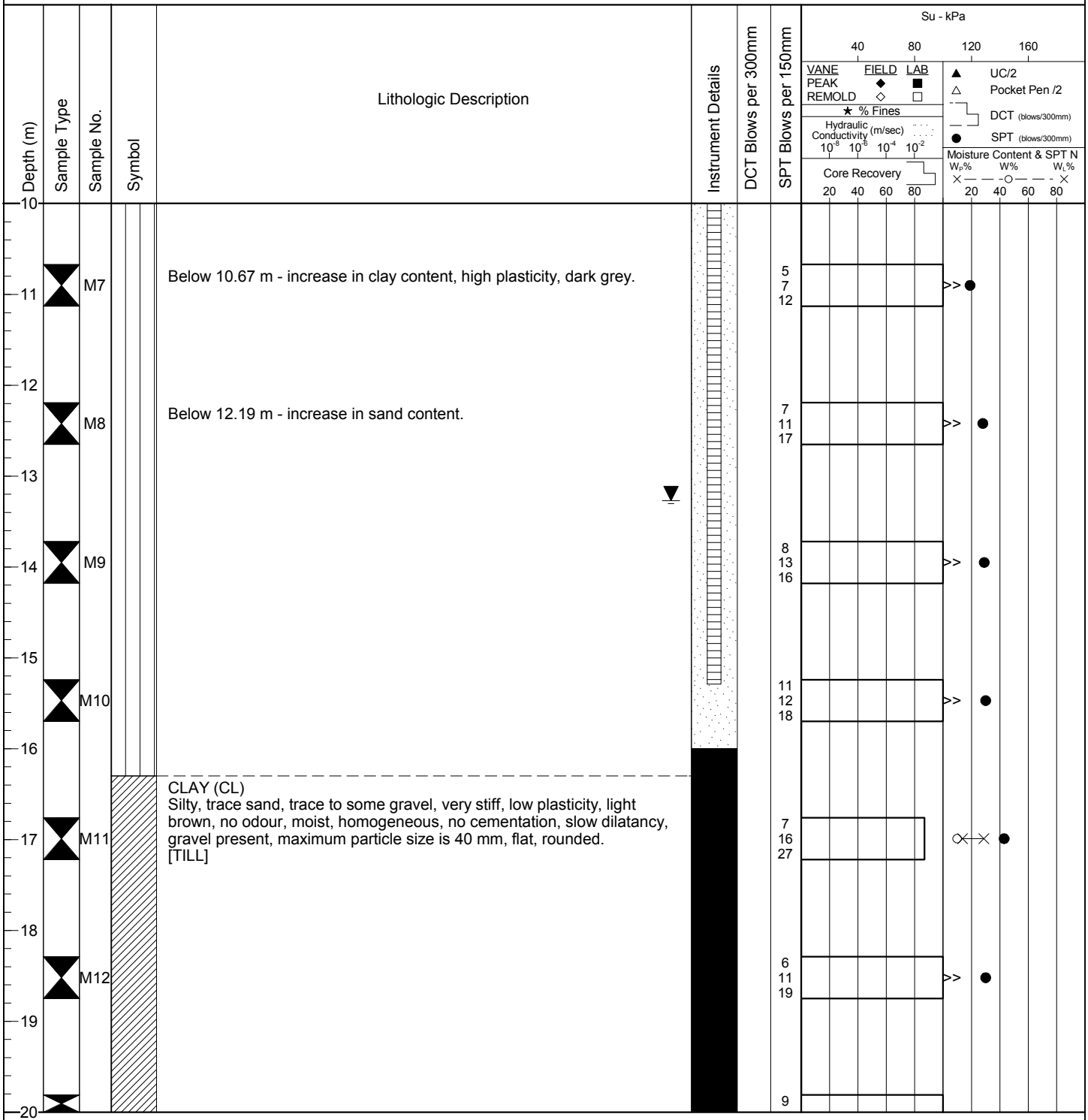
Su - kPa: 40, 80, 120, 160
VANE PEAK / FIELD ◆ / LAB ■
REMOLD ◇ / □
▲ UC/2
△ Pocket Pen /2
★ % Fines
Hydraulic Conductivity (m/sec) 10^{-8} 10^{-6} 10^{-4} 10^{-2}
DCT (blows/300mm)
● SPT (blows/300mm)
Core Recovery 20 40 60 80
Moisture Content & SPT N
W_P% W% W_L% 20 40 60 80

(Continued on next page)

Survey Method: Handheld GPS
Co-ordinates (m): 686,890E, 5,610,683N
Ground Elevation (m): 924
Datum: NAD83
Dip (degrees from horizontal): 90
Direction: n/a

Drill Designation: Fraste MD-XL
Drilling Contractor: Geotech Drilling
Drill Method: ODEX/Triple Tube
Core: HQ3
Fluid: Water
Casing: HWT **Cased To (m):** 24.38

Start Date: 09 Apr 13
Finish Date: 11 Apr 13
Final Depth of Hole (m): 34.44
Depth to Top of Rock (m): 23.16
Logged by: SLP
Reviewed by: BMM



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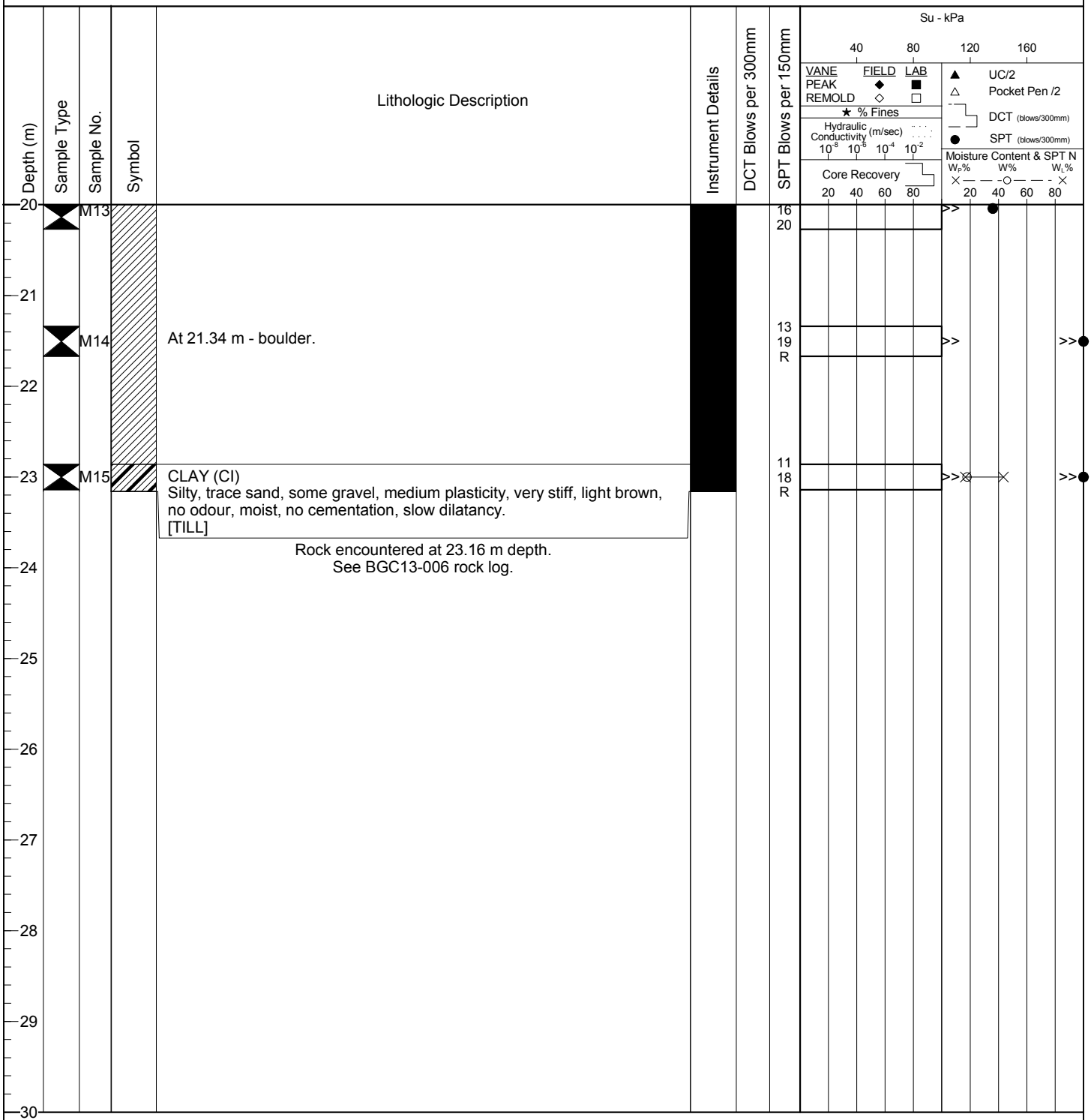
Survey Method: Handheld GPS
Co-ordinates (m): 686,890E, 5,610,683N
Ground Elevation (m): 924
Datum: NAD83
Dip (degrees from horizontal): 90
Direction: n/a

Drill Designation: Fraste MD-XL
Drilling Contractor: Geotech Drilling
Drill Method: ODEX/Triple Tube
Core: HQ3
Fluid: Water
Casing: HWT **Cased To (m):** 24.38

Start Date: 09 Apr 13
Finish Date: 11 Apr 13
Final Depth of Hole (m): 34.44
Depth to Top of Rock (m): 23.16
Logged by: SLP
Reviewed by: BMM



Survey Method :Handheld GPS
Co-ordinates (m) : 686,890E, 5,610,683N
Ground Elevation (m) : 924
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste MD-XL
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/Triple Tube
Core : HQ3
Fluid : Water
Casing : HWT **Cased To (m)** : 24.38

Start Date : 09 Apr 13
Finish Date : 11 Apr 13
Final Depth of Hole (m) : 34.44
Depth to Top of Rock (m) : 23.16
Logged by : SLP
Reviewed by : BMM

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
20					0 to 23.16 m - See BGC13-006 soil log.
23					BEDROCK Light green, medium grained, massive, medium strong (R3), slightly weathered (W2), discontinuities at 65° to 72° to core axis, JRC = 16-20. [IRON MASK HYBRID]
24			2		
25			2		Below 25.30 m - discontinuities at 35° to 65° to core axis, calcite infill, JRC = 4-20, rubble zone at end of run, weak (R2), fresh and unweathered to slightly weathered (W1-W2).
26			1.5		Below 26.82 m - discontinuities at 31° to 50° to core axis, calcite infill.
27			1.5		Below 28.35 m - discontinuities at 20° to 45° to core axis.
28					From 29.20 m to 29.37 m - broken and crushed rock, calcitic.
29					
30					

Instrument Details

Hydraulic Conductivity m/sec: 10^{-8} 10^{-6} 10^{-4} 10^{-2}

Core Recovery %

RQD %: 20 40 60 80

UCS - MPa: 50 100 150 200

Point Load

Triaxial

RMR: 20 40 60 80

(Continued on next page)

Survey Method :Handheld GPS
Co-ordinates (m) : 686,890E, 5,610,683N
Ground Elevation (m) : 924
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste MD-XL
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/Triple Tube
Core : HQ3
Fluid : Water
Casing : HWT **Cased To (m)** : 24.38

Start Date : 09 Apr 13
Finish Date : 11 Apr 13
Final Depth of Hole (m) : 34.44
Depth to Top of Rock (m) : 23.16
Logged by : SLP
Reviewed by : BMM

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
30			2		Below 29.87 m - discontinuities at 32° to 42° to core axis, weak, slightly weathered, patches of red iron oxidation, zones of highly fractured rock throughout. From 30.05 m to 30.16 m - zone of highly fractured rock, calcitic.
31		R1	2		At 31.39 m - zone of highly fractured rock, calcitic, very weak to weak (R1-R2), slightly weathered (W2).
32			2		
33			2		Below 32.92 m - discontinuities at 40° to 75° to core axis.
34					
35					END OF HOLE AT 34.44 m Notes: 1. 2" PVC standpipe piezometer installed with screen from 9.19 to 15.29 m. 2. Filter sand placed from 8.63 to 16.00 m. 3. Bentonite seal placed from 6.86 to 8.53 m and hydrated with water. 4. Water level measured on April 10, 2013: 13.27 m below ground surface. 5. SPT hammer type: Automatic trip, 140 lbs. N values shown are uncorrected.
36					
37					
38					
39					
40					

Instrument Details

Hydraulic Conductivity m/sec: 10^{-8} 10^{-6} 10^{-4} 10^{-2}

Core Recovery %

RQD %: 20 40 60 80

UCS - MPa: 50 100 150 200

Point Load

Triaxial

RMR: 20 40 60 80

Survey Method: Handheld GPS
Co-ordinates (m): 687,303E, 5,609,676N
Ground Elevation (m): 914
Datum: NAD83
Dip (degrees from horizontal): 90
Direction: n/a

Drill Designation: Fraste MD-XL
Drilling Contractor: Geotech Drilling
Drill Method: ODEX/Triple Tube
Core: HQ3
Fluid: Water
Casing: HWT **Cased To (m):** 16.76

Start Date: 12 Apr 13
Finish Date: 13 Apr 13
Final Depth of Hole (m): 26.82
Depth to Top of Rock (m): 15.85
Logged by: SLP
Reviewed by: BMM

Depth (m)	Sample Type	Sample No.	Lithologic Description
0		M1	ORGANICS Organic silt, vegetation, grasses, trace rootlets < 1 mm diameter.
0			SAND (SP) Fine, gravelly, some silt, poorly graded, compact, maximum particle size is 45 mm, flat and elongated, angular, light brown, no odour, dry, homogeneous, no cementation. [TILL]
2		M2	
3		M3	At 3.05 m - slightly reddish brown, low recovery of SPT due to driller forgetting to attach the core catcher.
5		M4	Below 4.57 m - particles are subrounded, grey. From 4.57 to 5.03 m - Particle Size Analysis: 27% gravel, 41% sand, 32% fines.
6		M5	SAND and SILT (SM) Fine, gravelly, trace clay, well graded, compact, maximum particle size is 40 mm, flat and elongated, subrounded, dark grey, no odour, dry to moist, homogeneous, some laminations of silt, no cementation. [TILL]
7			From 6.09 to 6.55 m - Particle Size Analysis: 22% gravel, 33% sand, 45% fines.
7		M6	GRAVEL and SAND (GM/SM) Fine to coarse, silty, well graded, maximum particle size is 25 mm, flat and elongated, subrounded, dark grey, no odour, dry, homogeneous, no cementation. [TILL]
9		M7	From 9.14 to 9.60 m - Particle Size Analysis: 38% gravel, 35% sand, 27% fines. Below 9.14 m - increase in fines content, moist.
10			

Instrument Details

DCT Blows per 300mm

SPT Blows per 150mm: 3, 4, 6 | 7, 10, 12 | 6, 12, 15 | 9, 15, 8 | 5, 12, R | R | 47, R

Su - kPa: 40, 80, 120, 160
VANE PEAK REMOLD — FIELD ◆ ◇ — LAB ■ □
UC/2 ▲
Pocket Pen /2 △
DCT (blows/300mm)
SPT (blows/300mm) ●
★ % Fines
Hydraulic Conductivity (m/sec) 10^{-8} 10^{-6} 10^{-4} 10^{-2}
Core Recovery: 20, 40, 60, 80
Moisture Content & SPT N: W_P% W% W_L%: 20, 40, 60, 80

(Continued on next page)

Survey Method: Handheld GPS
Co-ordinates (m): 687,303E, 5,609,676N
Ground Elevation (m): 914
Datum: NAD83
Dip (degrees from horizontal): 90
Direction: n/a

Drill Designation: Fraste MD-XL
Drilling Contractor: Geotech Drilling
Drill Method: ODEX/Triple Tube
Core: HQ3
Fluid: Water
Casing: HWT **Cased To (m):** 16.76

Start Date: 12 Apr 13
Finish Date: 13 Apr 13
Final Depth of Hole (m): 26.82
Depth to Top of Rock (m): 15.85
Logged by: SLP
Reviewed by: BMM

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details	DCT Blows per 300mm	SPT Blows per 150mm
10							
11		M8					R
12		M9		SILT (ML) Sandy, gravelly, trace clay, nonplastic, light brown to grey, no odour, dry, light laminations (bedding), no cementation, rapid dilatancy, gravel is coarse, maximum particle size is 35 mm, flat and elongated, subangular.			R
13							
14		M10		SAND (SM) Fine to medium, gravelly, silty, trace clay, well graded, very dense, maximum particle size is 25 mm, flat, subrounded, orangish light brown, no odour, dry, homogeneous, no cementation, some iron oxidation present. [TILL]			22 29 29
15		M11		Below 15.24 m - particles are angular, moist.			56 R
16				Rock encountered at 15.85 m depth. See BGC13-007 rock log.			
17							
18							
19							
20							

Su - kPa
40 80 120 160
VANE FIELD LAB
PEAK ◆ ■
REMOLD ◇ □
▲ UC/2
△ Pocket Pen /2
★ % Fines
Hydraulic Conductivity (m/sec)
10^{-8} 10^{-6} 10^{-4} 10^{-2}
DCT (blows/300mm)
● SPT (blows/300mm)
Core Recovery
20 40 60 80
Moisture Content & SPT N
W_P% W% W_L%
20 40 60 80

Survey Method :Handheld GPS
Co-ordinates (m) : 687,303E, 5,609,676N
Ground Elevation (m) : 914
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste MD-XL
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/Triple Tube
Core : HQ3
Fluid : Water
Casing : HWT **Cased To (m)** : 16.76

Start Date : 12 Apr 13
Finish Date : 13 Apr 13
Final Depth of Hole (m) : 26.82
Depth to Top of Rock (m) : 15.85
Logged by : SLP
Reviewed by : BMM

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description	Instrument Details
10					0 to 15.85 m - See BGC13-007 soil log.	
16					BEDROCK Dark grey, slightly green, fine to medium grained, mircofractured, medium strong (R3), slightly weathered (W2), rubble zone, no discernible discontinuity orientations. [IRON MASK HYBRID]	
17			2			
18			2		Below 17.68 m - dark greenish grey, highly fractured, no discernible discontinuity orientations, green surface staining, calcitic, JRC = 2.	
19						
20						

Hydraulic Conductivity m/sec: 10^{-8} 10^{-6} 10^{-4} 10^{-2}
Core Recovery %
RQD %: 20 40 60 80
UCS - MPa: 50 100 150 200
Point Load
Triaxial
RMR: 20 40 60 80

(Continued on next page)

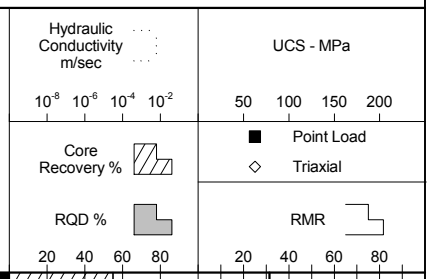
Survey Method :Handheld GPS
Co-ordinates (m) : 687,303E, 5,609,676N
Ground Elevation (m) : 914
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste MD-XL
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/Triple Tube
Core : HQ3
Fluid : Water
Casing : HWT **Cased To (m)** : 16.76

Start Date : 12 Apr 13
Finish Date : 13 Apr 13
Final Depth of Hole (m) : 26.82
Depth to Top of Rock (m) : 15.85
Logged by : SLP
Reviewed by : BMM

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
20			2		
21					From 20.73 m to 22.25 m - no recovery.
22					
23		S1	2		At 22.25 m - highly fractured rock, weak to medium strong (R2-R3), slightly weathered (W2). From 22.68 m to 22.98 m - minor fault, decomposed rock and clay infill, no discernible hanging wall.
24			2		Below 23.77 m - calcite infill of discontinuities, green surface staining, weak (R2).
25					
26			2		Below 25.29 m - highly fractured.
27					END OF HOLE AT 26.82 m Notes: 1. 2" PVC standpipe piezometer installed with screen from 9.22 to 12.27 m. 2. Filter sand placed from 8.53 to 12.80 m. 3. Bentonite seal placed from 7.04 to 8.53 m and hydrated with water. 4. Water level measured on April 15, 2013: 12.27 m below ground surface. 5. SPT hammer type: Automatic trip, 140 lbs. N values shown are uncorrected.
28					
29					
30					

Instrument Details



Survey Method: Handheld GPS
Co-ordinates (m): 686,560E, 5,609,618N
Ground Elevation (m): 914
Datum: NAD83
Dip (degrees from horizontal): 90
Direction: n/a

Drill Designation: Fraste MD-XL
Drilling Contractor: Geotech Drilling
Drill Method: ODEX/Triple Tube
Core: HQ3
Fluid: Water
Casing: HWT **Cased To (m):** 24.38

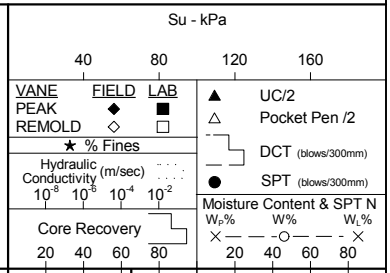
Start Date: 15 Apr 13
Finish Date: 17 Apr 13
Final Depth of Hole (m): 34.14
Depth to Top of Rock (m): 24.08
Logged by: SLP
Reviewed by: BMM

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description
0		M1		ORGANICS Vegetation (sage brush), grasses, trace rootlets < 1 mm diameter.
1				SAND and SILT (SM) Fine, clayey, some gravel, poorly graded, loose, maximum particle size is 20 mm, flat and elongated, subangular, light brown with green clasts, no odour, dry to lightly moist, homogeneous, no cementation, gravel is fine to coarse. [TILL]
2		M2		At 1.52 m - only gravel returned, compact, angular to subrounded.
3		M3		From 3.05 to 3.51 m - Particle Size Analysis: 18% gravel, 37% sand, 45% fines. Below 3.05 m - compact.
4				
5		M4		SAND and SILT (SM) Fine, gravelly, trace to some clay, well graded, compact, maximum particle size is 40 mm, flat, subrounded, light brown, no odour, dry to moist, homogeneous, no cementation. [TILL]
6		M5		From 4.57 to 5.03 m - Particle Size Analysis: 26% gravel, 36% sand, 38% fines. Below 6.10 m - gravelly, rounded. Below 6.27 m - colour change to grey.
7				
8		M6		Below 7.62 m - dense.
9		M7		Below 9.14 m - very dense.
10				

Instrument Details

DCT Blows per 300mm

SPT Blows per 150mm: 2, 2, 6 | 8, 20, 8 | 6, 9, 12 | 6, 11, 17 | 9, 16, 20 | 11, 22, 33 | 17, 34, 35



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Survey Method: Handheld GPS
Co-ordinates (m): 686,560E, 5,609,618N
Ground Elevation (m): 914
Datum: NAD83
Dip (degrees from horizontal): 90
Direction: n/a

Drill Designation: Fraste MD-XL
Drilling Contractor: Geotech Drilling
Drill Method: ODEX/Triple Tube
Core: HQ3
Fluid: Water
Casing: HWT **Cased To (m):** 24.38

Start Date: 15 Apr 13
Finish Date: 17 Apr 13
Final Depth of Hole (m): 34.14
Depth to Top of Rock (m): 24.08
Logged by: SLP
Reviewed by: BMM

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	SPT Blows per 150mm
10					
11		M8			19 34 46
12		M9		Below 12.19 m - dark grey, moist.	14 22 35
13					
14		M10		Below 13.72 m - increase in gravel content, decrease in fines content, wet. From 13.72 to 14.16 m - Particle Size Analysis: 36% gravel, 37% sand, 27% fines.	9 31 37
15					
16		M11		Below 15.24 m - some gravel, moist.	15 31 43
17		M12			12 18 33
18					
19		M13		From 18.29 to 18.76 m - 41% gravel, 45% sand, 14% fines. Below 18.29 m - increase in gravel and sands content, decrease in fines content, dry.	R
20				SAND (SC)	13

Instrument Details

DCT Blows per 300mm

Su - kPa: 40, 80, 120, 160
VANE PEAK / FIELD ◆ / LAB ■
REMOLD ◇ / □
▲ UC/2
△ Pocket Pen /2
★ % Fines
Hydraulic Conductivity (m/sec) 10^{-8} 10^{-6} 10^{-4} 10^{-2}
DCT (blows/300mm)
● SPT (blows/300mm)
Core Recovery: 20, 40, 60, 80
Moisture Content & SPT N: W_P% W% W_L%: 20, 40, 60, 80

(Continued on next page)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: KGHM International Ltd.

AJAX (SOIL) AJAX_SOIL.GDL BGC.GDT 9/26/13

Survey Method: Handheld GPS
Co-ordinates (m): 686,560E, 5,609,618N
Ground Elevation (m): 914
Datum: NAD83
Dip (degrees from horizontal): 90
Direction: n/a

Drill Designation: Fraste MD-XL
Drilling Contractor: Geotech Drilling
Drill Method: ODEX/Triple Tube
Core: HQ3
Fluid: Water
Casing: HWT **Cased To (m):** 24.38

Start Date: 15 Apr 13
Finish Date: 17 Apr 13
Final Depth of Hole (m): 34.14
Depth to Top of Rock (m): 24.08
Logged by: SLP
Reviewed by: BMM

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details	DCT Blows per 300mm	SPT Blows per 150mm
20							
		M14		Clayey, gravelly, dense, dark brown with grey clasts, no odour, moist, homogeneous, no cementation, maximum particle size is 25 mm, flat, subangular. [TILL]			22, 26
21				From 19.81 to 20.27 m - Particle Size Analysis: 24% gravel, 31% sand, 45% fines.			
		M15		Below 21.34 m - subrounded, grey.			14, 20, 36
22							
23		M16		Below 22.90 m - colour change to dark grey.			20, 40, 39
				SAND (SW) Fine, gravelly, some silt, trace clay, well graded, very dense, maximum particle size is 15 mm, equant, subangular, light brown, no odour, dry, homogeneous, no cementation, some iron oxidation. [TILL]			
24				Rock encountered at 24.08 m depth. See BGC13-008 rock log.			
25							
26							
27							
28							
29							
30							

Su - kPa: 40, 80, 120, 160
VANE PEAK / REMOLD — FIELD ◆ ◇ — LAB ■ □
▲ UC/2
△ Pocket Pen /2
★ % Fines
Hydraulic Conductivity (m/sec) 10^{-8} 10^{-6} 10^{-4} 10^{-2}
DCT (blows/300mm)
● SPT (blows/300mm)
Core Recovery: 20, 40, 60, 80
Moisture Content & SPT N: W_P% W% W_L%: 20, 40, 60, 80

Survey Method :Handheld GPS
Co-ordinates (m) : 686,560E, 5,609,618N
Ground Elevation (m) : 914
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste MD-XL
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/Triple Tube
Core : HQ3
Fluid : Water
Casing : HWT **Cased To (m)** : 24.38

Start Date : 15 Apr 13
Finish Date : 17 Apr 13
Final Depth of Hole (m) : 34.14
Depth to Top of Rock (m) : 24.08
Logged by : SLP
Reviewed by : BMM

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
20–23					0 to 24.08 m - See BGC13-008 soil log.
24					BEDROCK
24–25	M17		3		Light green, medium grained, microfractured, very weak (R1), moderately weathered (W3), highly fractured, no discernible joint set orientations. [IRON MASK HYBRID] From 24.38 to 24.84 m - SPT M17; N = refusal, recovery = 0.05 m. Below 24.99 m - fine grained, discontinuities at 40° to 75° to core axis, decomposed rock infill.
25–26			3		
26–27	R1		3		From 26.52 m to 27.13 m - minor fault, no discernible foot wall or hanging wall orientations, decomposed and crushed rock, gouge, sand and clay infill.
27–28			3		
28–29			2		Below 28.04 m - dark green, orange surface staining, iron oxidation.
29–30	R2				From 29.02 m to 29.94 m - highly fractured zone, dark reddish brown, iron oxidation on joint surfaces. From 29.80 m to 30.17 m - minor fault zone, decomposed rock, clay.

Instrument Details

Hydraulic Conductivity m/sec: 10^{-8} 10^{-6} 10^{-4} 10^{-2}
Core Recovery %
RQD %: 20 40 60 80

UCS - MPa: 50 100 150 200
Point Load
Triaxial
RMR: 20 40 60 80

(Continued on next page)

Survey Method :Handheld GPS
Co-ordinates (m) : 686,560E, 5,609,618N
Ground Elevation (m) : 914
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste MD-XL
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/Triple Tube
Core : HQ3
Fluid : Water
Casing : HWT **Cased To (m)** : 24.38

Start Date : 15 Apr 13
Finish Date : 17 Apr 13
Final Depth of Hole (m) : 34.14
Depth to Top of Rock (m) : 24.08
Logged by : SLP
Reviewed by : BMM

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
30			3.5		sand and silt infill. From 30.17 m to 34.14 m - highly fractured zone, very low recovery, slightly weathered (W2).
31			2		
32			2		
33			2		
34					END OF HOLE AT 34.14 m Notes: 1. 2" PVC standpipe piezometer installed with screen from 24.59 to 30.68 m. 2. Filter sand placed from 24.03 to 31.09 m. 3. Bentonite seal placed from 22.56 to 24.03 m and hydrated with water. 4. No water loss during drilling activities. 5. Unstable hole walls, catching on drill rods. 6. Water level measured on May 15, 2013: 23.49 m below ground surface. 7. SPT hammer type: Automatic trip, 140 lbs. N values shown are uncorrected.
35					
36					
37					
38					
39					
40					

Instrument Details

Hydraulic Conductivity m/sec
10^{-8} 10^{-6} 10^{-4} 10^{-2}

Core Recovery %

RQD %
20 40 60 80

UCS - MPa
50 100 150 200
■ Point Load
◇ Triaxial

RMR
20 40 60 80

Project: AJAX MEMA Support

DRILL HOLE # BGC13-009

Location: Plant Site

Project No. : 1125-003

Survey Method: Handheld GPS
Co-ordinates (m): 683,447E, 5,610,806N
Ground Elevation (m): 921
Datum: NAD83
Dip (degrees from horizontal): 90
Direction: n/a

Drill Designation: Fraste MD-XL
Drilling Contractor: Geotech Drilling
Drill Method: ODEX/Triple Tube
Core: HQ3
Fluid: Water
Casing: HWT **Cased To (m):** 15.54

Start Date: 18 Apr 13
Finish Date: 24 Apr 13
Final Depth of Hole (m): 24.99
Depth to Top of Rock (m): 15.54
Logged by: SLP
Reviewed by: AKU

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details	DCT Blows per 300mm	SPT Blows per 150mm
0				ORGANICS Vegetation, grasses, trace rootlets < 1 mm diameter.			2 2 4
		M1		SAND (SW) Fine, gravelly, trace silt, well graded, compact, maximum particle size is 30 mm, equant, subrounded, dark brown, no odour, dry, homogeneous, no cementation. [TILL]			13 R
1		M2		GRAVEL (GM) Coarse, sandy, some silt, trace clay, poorly graded, very dense, maximum particle size is 25 mm, flat, subrounded, light grey to white, no odour, dry, homogeneous, no cementation. [TILL]			17 34 37
2		M3		From 1.52 to 1.98 m - Particle Size Analysis: 53% gravel, 34% sand, 13% fines.			15 25 18
		M4		SAND (SM) Fine, gravelly, some silt, trace clay, well graded, dense, maximum particle size is 20 mm, flat, subangular, light brown (grey clasts), no odour, homogeneous, no cementation. [TILL]			6 10 14
3		M5		Below 3.05 m - compact, maximum particle size is 25 mm, medium brown.			
4				Below 4.57 m - dense, subrounded.			8 16 19
		M6					
5							
6							11 18 21
		M7					
7							
8		M8		Below 7.62 m - subangular, light brown with grey clasts.			10 28 24
9							
		M9		SILT (ML) Some gravel, some sand, trace clay, low plasticity, hard, light brown, no odour, moist, homogeneous, no cementation, rapid to slow dilatancy, gravel is flat, subrounded, sand is fine.			11 17 37
10							

Su - kPa: 40, 80, 120, 160
VANE PEAK / REMOLD — FIELD ◆ ◇ — LAB ■ □
UC/2 ▲ — Pocket Pen /2 △
★ % Fines
Hydraulic Conductivity (m/sec) 10^{-8} 10^{-6} 10^{-4} 10^{-2}
DCT (blows/300mm)
SPT (blows/300mm) ●
Core Recovery 20 40 60 80
Moisture Content & SPT N
W_P% W% W_L% 20 40 60 80

(Continued on next page)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: KGHM International Ltd.

Survey Method: Handheld GPS
Co-ordinates (m): 683,447E, 5,610,806N
Ground Elevation (m): 921
Datum: NAD83
Dip (degrees from horizontal): 90
Direction: n/a

Drill Designation: Fraste MD-XL
Drilling Contractor: Geotech Drilling
Drill Method: ODEX/Triple Tube
Core: HQ3
Fluid: Water
Casing: HWT **Cased To (m):** 15.54

Start Date: 18 Apr 13
Finish Date: 24 Apr 13
Final Depth of Hole (m): 24.99
Depth to Top of Rock (m): 15.54
Logged by: SLP
Reviewed by: AKU

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details	DCT Blows per 300mm	SPT Blows per 150mm
10							
11		M10		Below 10.67 m - very stiff, maximum particle size is 30 mm, flat, subrounded, colour change to light brownish grey.			7 13 15
12		M11					13 16 22
13							
14		M12		Below 13.72 m - hard, grey.			7 13 20
15		M13		At 15.24 m - refusal of SPT.			R
				Rock encountered at 15.54 m depth. See BGC13-009 rock log.			
16							
17							
18							
19							
20							

Su - kPa
40 80 120 160
VANE FIELD LAB
PEAK ◆ ■
REMOLD ◇ □
▲ UC/2
△ Pocket Pen /2
★ % Fines
Hydraulic Conductivity (m/sec)
10^{-8} 10^{-6} 10^{-4} 10^{-2}
DCT (blows/300mm)
● SPT (blows/300mm)
Core Recovery
20 40 60 80
Moisture Content & SPT N
W_P% W% W_L%
20 40 60 80

Survey Method :Handheld GPS
Co-ordinates (m) : 683,447E, 5,610,806N
Ground Elevation (m) : 921
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste MD-XL
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/Triple Tube
Core : HQ3
Fluid : Water
Casing : HWT **Cased To (m)** : 15.54

Start Date : 18 Apr 13
Finish Date : 24 Apr 13
Final Depth of Hole (m) : 24.99
Depth to Top of Rock (m) : 15.54
Logged by : SLP
Reviewed by : AKU

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description	Instrument Details
10					0 to 15.54 m - See BGC13-009 soil log.	
15						
15.54			1		BEDROCK	
16			1		Dark green, coarse grained, microfractured, medium strong (R3), fresh and unweathered (W1), 2 joint sets present, average joint condition is 16. [IRON MASK HYBRID] Below 15.85 m - calcitic joints, quartz veining throughout, discontinuities at 18° to 90° to core axis.	
17						
17.37			1		Below 17.37 m - discontinuities at 35° to 75° to core axis.	
18						
18.90			1		Below 18.90 m - stockwork, discontinuities at 0° to 80° to core axis, with calcite and crushed rock infill.	
20						

Hydraulic Conductivity m/sec: 10^{-8} 10^{-6} 10^{-4} 10^{-2}
Core Recovery %
RQD %: 20 40 60 80
UCS - MPa: 50 100 150 200
Point Load
Triaxial
RMR: 20 40 60 80

(Continued on next page)

Survey Method :Handheld GPS
Co-ordinates (m) : 683,447E, 5,610,806N
Ground Elevation (m) : 921
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste MD-XL
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/Triple Tube
Core : HQ3
Fluid : Water
Casing : HWT **Cased To (m)** : 15.54

Start Date : 18 Apr 13
Finish Date : 24 Apr 13
Final Depth of Hole (m) : 24.99
Depth to Top of Rock (m) : 15.54
Logged by : SLP
Reviewed by : AKU

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
20					
21			1		Below 20.42 m - discontinuities are at 34° to 55° to core axis, with calcite infill. From 20.42 m to 21.12 m - rubble zone, no discernible joint sets.
22		R14			Below 21.95 m - discontinuities at 28° to 45° to core axis, with calcite and trace crushed rock infill.
23			1		
24			1		Below 23.47 m - various colour changes from light green to dark green, discontinuities at 43° to 60° to core axis.
25					END OF HOLE AT 24.99 m
26					Notes: 1. 2.5" PVC standpipe piezometer installed with screen from 13.56 to 16.61 m. 2. Filter sand placed from 12.80 to 17.68 m. 3. Bentonite seal placed from 11.58 to 12.80 m and hydrated with water. 4. Water level measured on April 24, 2013: 9.62 m below ground surface. 5. SPT hammer type: Automatic trip, 140 lbs. N values shown are uncorrected. 6. Select rock core samples from this hole were tested for Unconfined Compressive Strength, however results are not included in this log.
27					
28					
29					
30					

Instrument Details

Hydraulic Conductivity m/sec
10^{-8} 10^{-6} 10^{-4} 10^{-2}

Core Recovery %

RQD %
20 40 60 80

UCS - MPa
50 100 150 200

■ Point Load
◇ Triaxial

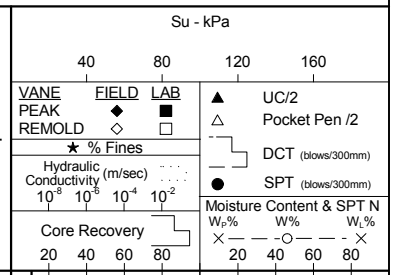
RMR
20 40 60 80

Survey Method: Handheld GPS
Co-ordinates (m): 683,317E, 5,610,751N
Ground Elevation (m): 931
Datum: NAD83
Dip (degrees from horizontal): 90
Direction: n/a

Drill Designation: Fraste MD-XL
Drilling Contractor: Geotech Drilling
Drill Method: ODEX/Triple Tube
Core: HQ3
Fluid: Water
Casing: HWT **Cased To (m):** 7.62

Start Date: 24 Apr 13
Finish Date: 25 Apr 13
Final Depth of Hole (m): 17.54
Depth to Top of Rock (m): 6.71
Logged by: MPL
Reviewed by: AKU

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details	DCT Blows per 300mm	SPT Blows per 150mm
0		M1		SILT (ML) Sandy, some clay, trace medium gravel, low plasticity, soft, dark brown, dry, homogeneous, no cementation, rapid dilatancy, rootmat. [FILL]			1 2 3
1		M2		CLAY (CL) Silty, some sand, trace fine to medium gravel, low plasticity, very stiff, dark brown, no odour, moist (near plastic limit), no structure, no to moderate cementation, rapid dilatancy. [TILL]			8 11
		M3					17 R
2				GRAVEL (GM) Coarse, sandy, silty, some clay, compact, maximum particle size is 30 mm, equant, subangular, grey with white mottling, no odour, dry, homogeneous, no cementation, multi-lithic. [TILL]			
		M4					6 10 12
3				SILT (ML) Clayey, sandy, some gravel, low plasticity, very stiff, greyish brown, no odour, moist (near plastic limit), no structure, moderate cementation, slow dilatancy, gravel is fine to coarse, subangular to subrounded, multi-lithic. [TILL]			3 13 45
		M5					
4							11 15 17
		M6					
		M7					4 13 19
5							
6							
		M8		From 6.09 m to 6.55 m - no recovery of SPT.			10 11 16
7				Rock encountered at 6.71 m depth. See BGC13-010 rock log.			
8							
9							
10							



BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: KGHM International Ltd.

AJAX (SOIL) AJAX_SOIL.GDL BGC.GDT 9/26/13

Survey Method :Handheld GPS
Co-ordinates (m) : 683,317E, 5,610,751N
Ground Elevation (m) : 931
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste MD-XL
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/Triple Tube
Core : HQ3
Fluid : Water
Casing : HWT **Cased To (m)** : 7.62

Start Date : 24 Apr 13
Finish Date : 25 Apr 13
Final Depth of Hole (m) : 17.54
Depth to Top of Rock (m) : 6.71
Logged by : MPL
Reviewed by : AKU

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description	Instrument Details
0					0 to 6.71 m - See BGC13-010 soil log.	
7					BEDROCK Light green with dark green and white mottling, fine grained, microfractured, medium strong (R3), slightly weathered (W2), 3 joint sets at 40°; 40° (oblique); and 60° to core axis, white schist, crushed and broken rock infill, smooth, planar, highly fractured - through microfractures. [IRON MASK HYBRID]	
8			2		From 7.62 m to 9.94 m - trace staining on discontinuity surfaces, light orange, yellowish green, iron oxidation.	
9			2		At 8.86 m - joint at 42° to core axis, light olive silt infill, 1 mm aperture, smooth to rough, planar. At 9.11 m - joint at 35° to core axis with crushed rock and white silt infill, smooth to rough surfaces.	
10						

Hydraulic Conductivity m/sec: 10^{-8} 10^{-6} 10^{-4} 10^{-2}
Core Recovery %
RQD %: 20 40 60 80
UCS - MPa: 50 100 150 200
Point Load
Triaxial
RMR: 20 40 60 80

(Continued on next page)

Survey Method :Handheld GPS
Co-ordinates (m) : 683,317E, 5,610,751N
Ground Elevation (m) : 931
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste MD-XL
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/Triple Tube
Core : HQ3
Fluid : Water
Casing : HWT **Cased To (m)** : 7.62

Start Date : 24 Apr 13
Finish Date : 25 Apr 13
Final Depth of Hole (m) : 17.54
Depth to Top of Rock (m) : 6.71
Logged by : MPL
Reviewed by : AKU

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
10			2		From 10.26 m to 11.10 m - joint at 5° to core axis, 2 mm aperture, planar, light greyish green silt and crushed rock infill, smooth surfaces.
11			2		Below 11.46 m - fine to medium grained.
12			2		From 12.05 m to 12.11 m - highly fractured/altered zone, crushed and decomposed to silt and clay, some fine gravel, light bluish green, discontinuities at 40° and 45° (oblique) to core axis. At 12.20 m - joint at 50° to core axis, reddish brown staining with light bluish green schists.
13			2		Below 13.75 m - rock recovery is less fractured through micro fractures, joint spacing is < 1 mm. From 13.77 m to 14.50 m - vein at 10° to core axis, smooth discontinuity surfaces with dark green staining.
14			2		Below 15.63 m - 3 joint sets at 48°, 30° and 15° to core axis, trace calcite infill, planar to stepped, smooth, less fragmented through microfractures, fresh and unweathered (W1).
15			1		END OF HOLE AT 17.54 m Notes: 1. 2.5" PVC standpipe piezometer installed with screen from 5.18 to 8.23 m. 2. Filter sand placed from 4.52 to 8.53 m. 3. Bentonite seal placed from 3.20 to 4.52 m and hydrated with water. 4. Water level measured on April 25, 2013: 2.95 m below ground surface. 5. SPT hammer type: Automatic trip, 140 lbs. N values shown are uncorrected.
16					
17					
18					
19					
20					

Instrument Details

Hydraulic Conductivity m/sec
10^{-8} 10^{-6} 10^{-4} 10^{-2}

Core Recovery %

RQD %
20 40 60 80

UCS - MPa
50 100 150 200
■ Point Load
◇ Triaxial

RMR
20 40 60 80

Survey Method: Handheld GPS
Co-ordinates (m): 682,911E, 5,610,639N
Ground Elevation (m): 911
Datum: NAD83
Dip (degrees from horizontal): 90
Direction: n/a

Drill Designation: Fraste MD-XL
Drilling Contractor: Geotech Drilling
Drill Method: ODEX/Triple Tube
Core: HQ3
Fluid: Water
Casing: HWT **Cased To (m):** 4.57

Start Date: 25 Apr 13
Finish Date: 25 Apr 13
Final Depth of Hole (m): 14.56
Depth to Top of Rock (m): 3.65
Logged by: MPL
Reviewed by: AKU

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details	DCT Blows per 300mm	SPT Blows per 150mm
0							
		M1		SILT and CLAY (ML) Some sand to sandy, low plasticity, soft to firm, dark brown, organic odour, moist (near plastic limit), homogeneous, no cementation, slow dilatancy, rootmat. [FILL]			2 2 4
1		M2		GRAVEL (GC) Clayey, sandy, trace cobbles, compact, light greyish brown, no odour, moist, homogeneous, weak cementation, maximum particle size is 20 mm, equant to flat, subangular to subrounded, multi-lithic. [TILL]			8 9 14
		M3		From 1.52 to 1.98 m - Particle Size Analysis: 37% gravel, 32.5% sand, 30.4% fines.			14 14 19
2		M4		From 2.43 to 3.65 m - maximum particle size is 30 mm, subrounded, moisture content increases with depth.			8 12 11
3		M5		At 3.51 m - free water on gravel.			9 11 14
4				Rock encountered at 3.65 m depth. See BGC13-011 rock log.			
5							
6							
7							
8							
9							
10							

Su - kPa: 40, 80, 120, 160
VANE PEAK / REMOLD — FIELD ◆ ◇ — LAB ■ □
UC/2 ▲
Pocket Pen /2 △
DCT (blows/300mm)
SPT (blows/300mm) ●
★ % Fines
Hydraulic Conductivity (m/sec) 10^{-8} 10^{-6} 10^{-4} 10^{-2}
Core Recovery 20 40 60 80
Moisture Content & SPT N
W_P% W% W_L% 20 40 60 80

Survey Method :Handheld GPS
Co-ordinates (m) : 682,911E, 5,610,639N
Ground Elevation (m) : 911
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste MD-XL
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/Triple Tube
Core : HQ3
Fluid : Water
Casing : HWT **Cased To (m)** : 4.57

Start Date : 25 Apr 13
Finish Date : 25 Apr 13
Final Depth of Hole (m) : 14.56
Depth to Top of Rock (m) : 3.65
Logged by : MPL
Reviewed by : AKU

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description	Instrument Details
0					0 to 3.65 m - See BGC13-011 soil log.	
4					BEDROCK Green with dark greenish blue and light yellowish green mottling, fine to medium grained, microfractured and massive, medium strong (R3), slightly weathered (W2), 4 joint sets at 15°-20°; 30°, 40° and 60° to core axis, some quartz veins along joints, rough, planar to stepped, pyrite flecks on microfractures. [IRON MASK HYBRID]	
5			2.5			
6			2		From 6.50 m to 8.48 m - colour change to light green with yellowish green patches.	
7			2			
8					From 8.20 m to 8.26 m - dark green zone, pyrite present, vuggy surfaces. At 8.48 m - joint along quartz vein, 42° to core axis, 2 mm aperture.	
9			2			
10					At 9.50 m - red staining on discontinuity surfaces, joint along quartz vein, 25° to core axis.	

Hydraulic Conductivity m/sec: 10^{-8} 10^{-6} 10^{-4} 10^{-2}
Core Recovery %
RQD %: 20 40 60 80
UCS - MPa: 50 100 150 200
Point Load
Triaxial
RMR: 20 40 60 80

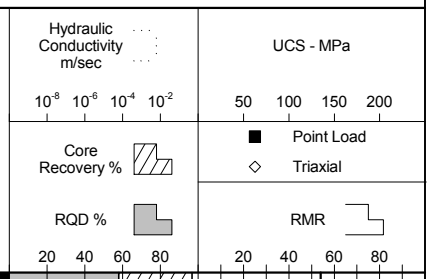
(Continued on next page)

Survey Method :Handheld GPS
Co-ordinates (m) : 682,911E, 5,610,639N
Ground Elevation (m) : 911
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste MD-XL
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/Triple Tube
Core : HQ3
Fluid : Water
Casing : HWT **Cased To (m)** : 4.57

Start Date : 25 Apr 13
Finish Date : 25 Apr 13
Final Depth of Hole (m) : 14.56
Depth to Top of Rock (m) : 3.65
Logged by : MPL
Reviewed by : AKU

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description	Instrument Details
10			2			
11						
12			2			
13		R6			At 13.04 m - joint at 45° to core axis, grey silt infill.	
14			2			
15					END OF HOLE AT 14.56 m Notes: 1. 2.5" PVC standpipe piezometer installed with screen from 2.13 to 5.18 m. 2. Filter sand placed from 1.52 to 5.79 m. 3. Bentonite seal placed from 0.91 to 1.52 m and hydrated with water. 4. Water level measured on April 27, 2013: 1.83m below ground surface. 5. SPT hammer type: Automatic trip, 140 lbs. N values shown are uncorrected. 6. Select rock core samples from this hole were tested for Unconfined Compressive Strength, however results are not included in this log.	
16						
17						
18						
19						
20						

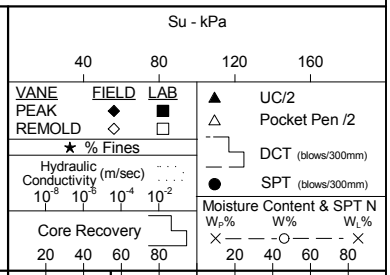


Survey Method: Handheld GPS
Co-ordinates (m): 683,129E, 5,610,699N
Ground Elevation (m): 925
Datum: NAD83
Dip (degrees from horizontal): 90
Direction: n/a

Drill Designation: Fraste MD-XL
Drilling Contractor: Geotech Drilling
Drill Method: ODEX/Triple Tube
Core: HQ3
Fluid: Water
Casing: HWT **Cased To (m):** 3.05

Start Date: 26 Apr 13
Finish Date: 26 Apr 13
Final Depth of Hole (m): 13.14
Depth to Top of Rock (m): 2.28
Logged by: MPL
Reviewed by: AKU

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details	DCT Blows per 300mm	SPT Blows per 150mm
0		M1		SILT and SAND (ML) Some clay to clayey, trace gravel, low plasticity, soft to firm, dark brown, no odour, moist, homogeneous, no cementation, rapid dilatancy, trace rootlets throughout, gravel is coarse. [FILL]			1 3 3
1		M2		GRAVEL (GM) Fine to coarse, sandy, some silt to silty, trace clay, trace cobbles, well graded, compact, maximum particle size is 30 mm, equant to flat, subangular to subrounded, light brown, dry, homogeneous, weak to no cementation, low dry strength. [TILL]			4 8 14
2		M3					9 16 13
				Rock encountered at 2.28 m depth. See BGC13-012 rock log.			
3							
4							
5							
6							
7							
8							
9							
10							



BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: KGHM International Ltd.

Survey Method :Handheld GPS
Co-ordinates (m) : 683,129E, 5,610,699N
Ground Elevation (m) : 925
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste MD-XL
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/Triple Tube
Core : HQ3
Fluid : Water
Casing : HWT **Cased To (m)** : 3.05

Start Date : 26 Apr 13
Finish Date : 26 Apr 13
Final Depth of Hole (m) : 13.14
Depth to Top of Rock (m) : 2.28
Logged by : MPL
Reviewed by : AKU

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					0 to 2.28 m - See BGC13-012 soil log.
2.28			3		BEDROCK Dark green with white staining in microfractures, fine to coarse grained, microfractured, weak to medium strong (R2-R3), slightly to moderately weathered (W2-W3), 3 joint sets at 30° - 40°; 15° and 60° to core axis, orangish brown silt on subparallel joint surfaces, joints are rough, stepped to planar, rock is highly fractured. [IRON MASK HYBRID] ▼ From 3.05 m to 9.13 m - reddish brown, orange iron oxidation on discontinuity surfaces.
3.66			2.5		
4.27			2.5		
4.88			3		
5.08			2.5		From 5.08 m to 5.48 m - weak (R2), extremely weathered (W4) zone, brown and green gravel, crushed rock.
7.48			2.5		From 7.48 m to 9.75 m - highly fractured zone, maximum particle size is 50 mm.
8.38			3		From 8.38 m to 8.44 m - sand and silt infill.
9.75			3		
9.83			2.5		From 9.75 m to 9.83 m - crushed rock and clay.

Instrument Details

Hydraulic Conductivity m/sec: 10^{-8} 10^{-6} 10^{-4} 10^{-2}
Core Recovery %
RQD %: 20 40 60 80

UCS - MPa: 50 100 150 200
Point Load
Triaxial
RMR: 20 40 60 80

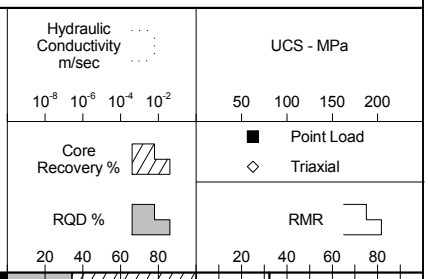
(Continued on next page)

Survey Method :Handheld GPS
Co-ordinates (m) : 683,129E, 5,610,699N
Ground Elevation (m) : 925
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste MD-XL
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/Triple Tube
Core : HQ3
Fluid : Water
Casing : HWT **Cased To (m)** : 3.05

Start Date : 26 Apr 13
Finish Date : 26 Apr 13
Final Depth of Hole (m) : 13.14
Depth to Top of Rock (m) : 2.28
Logged by : MPL
Reviewed by : AKU

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description	Instrument Details
10					From 9.75 m to 10.27 m - pyrite present, crushed rock and clay until 9.83 m.	
11			2		Below 10.98 m - slickensides present, reddish brown staining on discontinuity surfaces, 65° to core axis.	
12			2		At 11.50 m - joint along quartz vein, 56° to core axis.	
13					END OF HOLE AT 13.14 m	
14					Notes: 1. 2.5" PVC standpipe piezometer installed with screen from 1.21 to 3.65 m. 2. Filter sand placed from 1.21 to 4.26 m. 3. Bentonite seal placed from 0.00 to 0.91 m and hydrated with water. 4. Water level measured on April 27, 2013: 3.57 m below ground surface. 5. SPT hammer type: Automatic trip, 140 lbs. N values shown are uncorrected.	
15						
16						
17						
18						
19						
20						

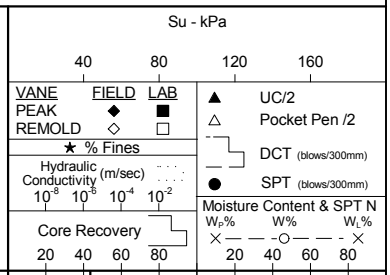


Survey Method: Handheld GPS
Co-ordinates (m): 682,860E, 5,610,788N
Ground Elevation (m): 934
Datum: NAD83
Dip (degrees from horizontal): 90
Direction: n/a

Drill Designation: Fraste MD-XL
Drilling Contractor: Geotech Drilling
Drill Method: ODEX/Triple Tube
Core: HQ3
Fluid: Water
Casing: HWT **Cased To (m):** 3.05

Start Date: 26 Apr 13
Finish Date: 27 Apr 13
Final Depth of Hole (m): 13.02
Depth to Top of Rock (m): 2.20
Logged by: MPL
Reviewed by: AKU

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details	DCT Blows per 300mm	SPT Blows per 150mm
0							
		M1		SILT and SAND (ML) Gravelly, some clay, low plasticity, very soft to firm, dark brown, no odour, moist to dry, homogeneous, no cementation, rapid dilatancy, trace rootlets in top 0.45 m. [FILL]			2 1 1
1		M2					11 22 22
		M3		GRAVEL (GM) Coarse, sandy, silty, trace cobbles, well graded, dense to very dense, maximum particle size is 25 mm, subangular and subrounded, light brown with grey, no odour, dry, stratified to homogeneous, weak to moderate cementation. [TILL] From 1.52 to 1.98 m - Particle Size Analysis: 45% gravel, 27% sand, 28% fines.			12 31 28
2				Rock encountered at 2.20 m depth. See BGC13-013 rock log.			
3							
4							
5							
6							
7							
8							
9							
10							



BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: KGHM International Ltd.

AJAX (SOIL) AJAX_SOIL.GDL BGC.GDT 9/26/13

Survey Method :Handheld GPS
Co-ordinates (m) : 682,860E, 5,610,788N
Ground Elevation (m) : 934
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste MD-XL
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/Triple Tube
Core : HQ3
Fluid : Water
Casing : HWT **Cased To (m)** : 3.05

Start Date : 26 Apr 13
Finish Date : 27 Apr 13
Final Depth of Hole (m) : 13.02
Depth to Top of Rock (m) : 2.20
Logged by : MPL
Reviewed by : AKU

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					0 to 2.20 m - See BGC13-013 soil log.
2					BEDROCK Dark green with grey and white mottling, fine to medium grained, microfractured to massive, granular, weak to medium strong (R2-R3), slightly weathered (W2), 4 joint sets at 40°; 60°, 18° and 15° to core axis, joints present along quartz veins, some subparallel joints have orange iron oxidation, rough, planar to undulating. [IRON MASK HYBRID]
3			2		From 3.05 m to 5.42 m - zone of highly fractured rock.
4			2.5		
5					
6			2		At 5.72 m - joint at 60° to core axis, orangish brown clay infill, 1 mm aperture.
7					Below 7.21 m - slickensides present, 40° to core axis.
8			2		Below 8.27 m - 2 joint sets (oblique) at 15° and 20° to core axis, yellow clay infill, very tight.
9			2		At 8.82 m - joint along quartz vein, 20° to core axis, schist, crushed rock infill, rough and undulating.
10					

Instrument Details

Hydraulic Conductivity m/sec: 10^{-8} 10^{-6} 10^{-4} 10^{-2}

Core Recovery %

RQD %: 20 40 60 80

UCS - MPa: 50 100 150 200

Point Load

Triaxial

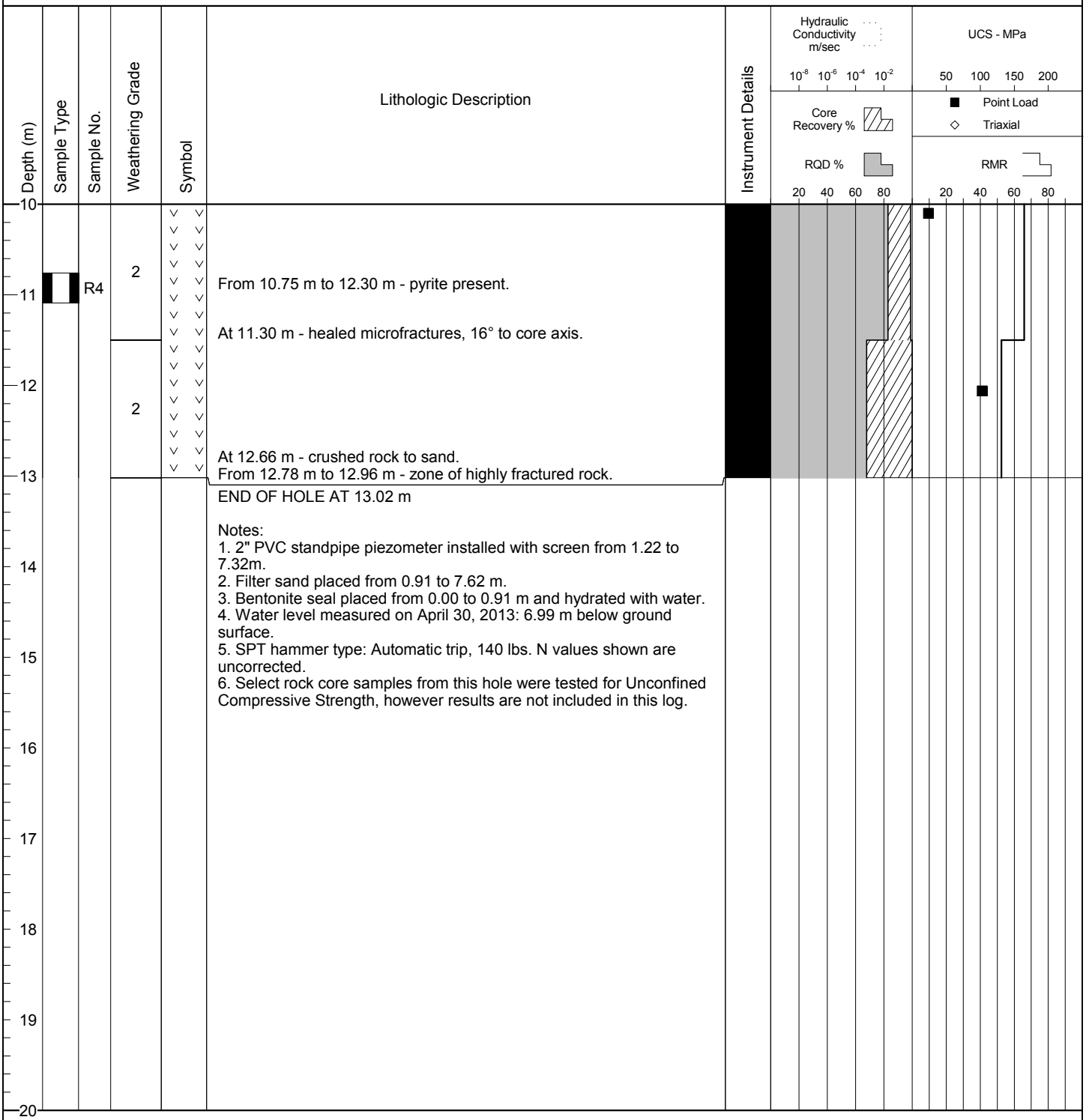
RMR: 20 40 60 80

(Continued on next page)

Survey Method :Handheld GPS
Co-ordinates (m) : 682,860E, 5,610,788N
Ground Elevation (m) : 934
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste MD-XL
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/Triple Tube
Core : HQ3
Fluid : Water
Casing : HWT **Cased To (m)** : 3.05

Start Date : 26 Apr 13
Finish Date : 27 Apr 13
Final Depth of Hole (m) : 13.02
Depth to Top of Rock (m) : 2.20
Logged by : MPL
Reviewed by : AKU



Notes:
1. 2" PVC standpipe piezometer installed with screen from 1.22 to 7.32m.
2. Filter sand placed from 0.91 to 7.62 m.
3. Bentonite seal placed from 0.00 to 0.91 m and hydrated with water.
4. Water level measured on April 30, 2013: 6.99 m below ground surface.
5. SPT hammer type: Automatic trip, 140 lbs. N values shown are uncorrected.
6. Select rock core samples from this hole were tested for Unconfined Compressive Strength, however results are not included in this log.

Survey Method: Handheld GPS
Co-ordinates (m): 683,791E, 5,611,053N
Ground Elevation (m): 978
Datum: NAD83
Dip (degrees from horizontal): 90
Direction: n/a

Drill Designation: Fraste MD-XL
Drilling Contractor: Geotech Drilling
Drill Method: ODEX/Triple Tube
Core: HQ3
Fluid: Water
Casing: HWT **Cased To (m):** 41.15

Start Date: 27 Apr 13
Finish Date: 30 Apr 13
Final Depth of Hole (m): 52.80
Depth to Top of Rock (m): 40.23
Logged by: MPL
Reviewed by: AKU

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details	DCT Blows per 300mm	SPT Blows per 150mm
0		M1		ORGANICS Vegetation, grasses, trace rootlets < 1 mm diameter, dry.			2 2 5
				SILT (SM) Some sand, some clay, some gravel, low plasticity, stiff, dark brown, no odour, moist (near plastic limit), homogeneous, weak cementation, slow dilatancy, sand is fine, gravel is fine. [TILL]			
1							
		M2		GRAVEL (GM) Fine to coarse, sandy, some silt, trace clay, dense to very dense, maximum particle size is 30 mm, equant, subangular to subrounded, light brown with grey and brown mottling, no odour, dry, homogeneous, weak cementation. [TILL]			19 23 38
2							
3		M3		From 3.05 m - silty clay pockets, dark brown.			20 15 19
4							
		M4		From 4.57 m to 5.03 m - silty.			9 14 18
5							
6							
		M5		SILT and SAND (ML/SM) Gravelly, some clay, low plasticity, very stiff to hard, dark brown, no odour, moist, homogeneous, moderate cementation, slow dilatancy, gravel is fine to coarse, multi-lithic, maximum particle size is 15 mm. [TILL]			8 15 17
7				From 6.09 to 6.55 m - Particle Size Analysis: 21% gravel, 36% sand, 43% fines.			
		M6					9 14 17
8							
9							
		M7		Below 9.14 m - gravelly, maximum particle size is 25 mm, subrounded, equant.			10 13 13
10							

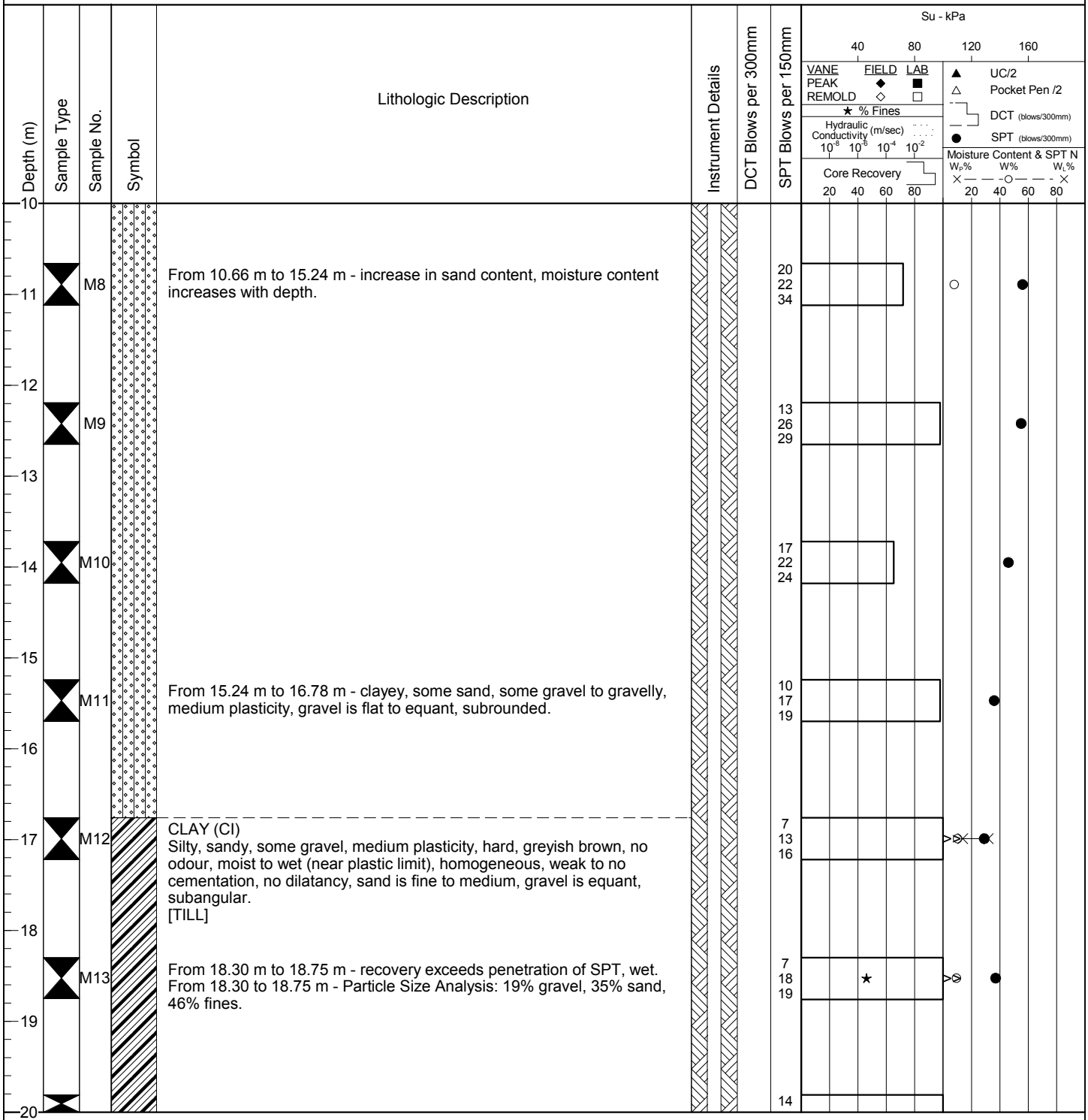
Su - kPa
40 80 120 160
VANE FIELD LAB
PEAK ◆ ■
REMOLD ◇ □
▲ UC/2
△ Pocket Pen /2
★ % Fines
Hydraulic Conductivity (m/sec)
10^{-8} 10^{-6} 10^{-4} 10^{-2}
DCT (blows/300mm)
● SPT (blows/300mm)
Core Recovery
20 40 60 80
Moisture Content & SPT N
W_P% W% W_L%
20 40 60 80

(Continued on next page)

Survey Method: Handheld GPS
Co-ordinates (m): 683,791E, 5,611,053N
Ground Elevation (m): 978
Datum: NAD83
Dip (degrees from horizontal): 90
Direction: n/a

Drill Designation: Fraste MD-XL
Drilling Contractor: Geotech Drilling
Drill Method: ODEX/Triple Tube
Core: HQ3
Fluid: Water
Casing: HWT **Cased To (m):** 41.15

Start Date: 27 Apr 13
Finish Date: 30 Apr 13
Final Depth of Hole (m): 52.80
Depth to Top of Rock (m): 40.23
Logged by: MPL
Reviewed by: AKU



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Survey Method: Handheld GPS
Co-ordinates (m): 683,791E, 5,611,053N
Ground Elevation (m): 978
Datum: NAD83
Dip (degrees from horizontal): 90
Direction: n/a

Drill Designation: Fraste MD-XL
Drilling Contractor: Geotech Drilling
Drill Method: ODEX/Triple Tube
Core: HQ3
Fluid: Water
Casing: HWT **Cased To (m):** 41.15

Start Date: 27 Apr 13
Finish Date: 30 Apr 13
Final Depth of Hole (m): 52.80
Depth to Top of Rock (m): 40.23
Logged by: MPL
Reviewed by: AKU

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details	DCT Blows per 300mm	SPT Blows per 150mm
20		M14					10 17
21							
		M15			▼		12 17 22
22							
23		M16		From 22.80 m to 23.32 m - recovery exceeds penetration of SPT.			11 18 21
24							
		M17		From 24.38 m to 24.84 m - increase in gravel content.			9 27 22
25							
26		M18					14 26 28
27							
		M19					9 12 13
28							
29		M20		From 28.95 m to 29.40 m - sandy, recovery exceeds penetration of SPT.			6 12 17
30							

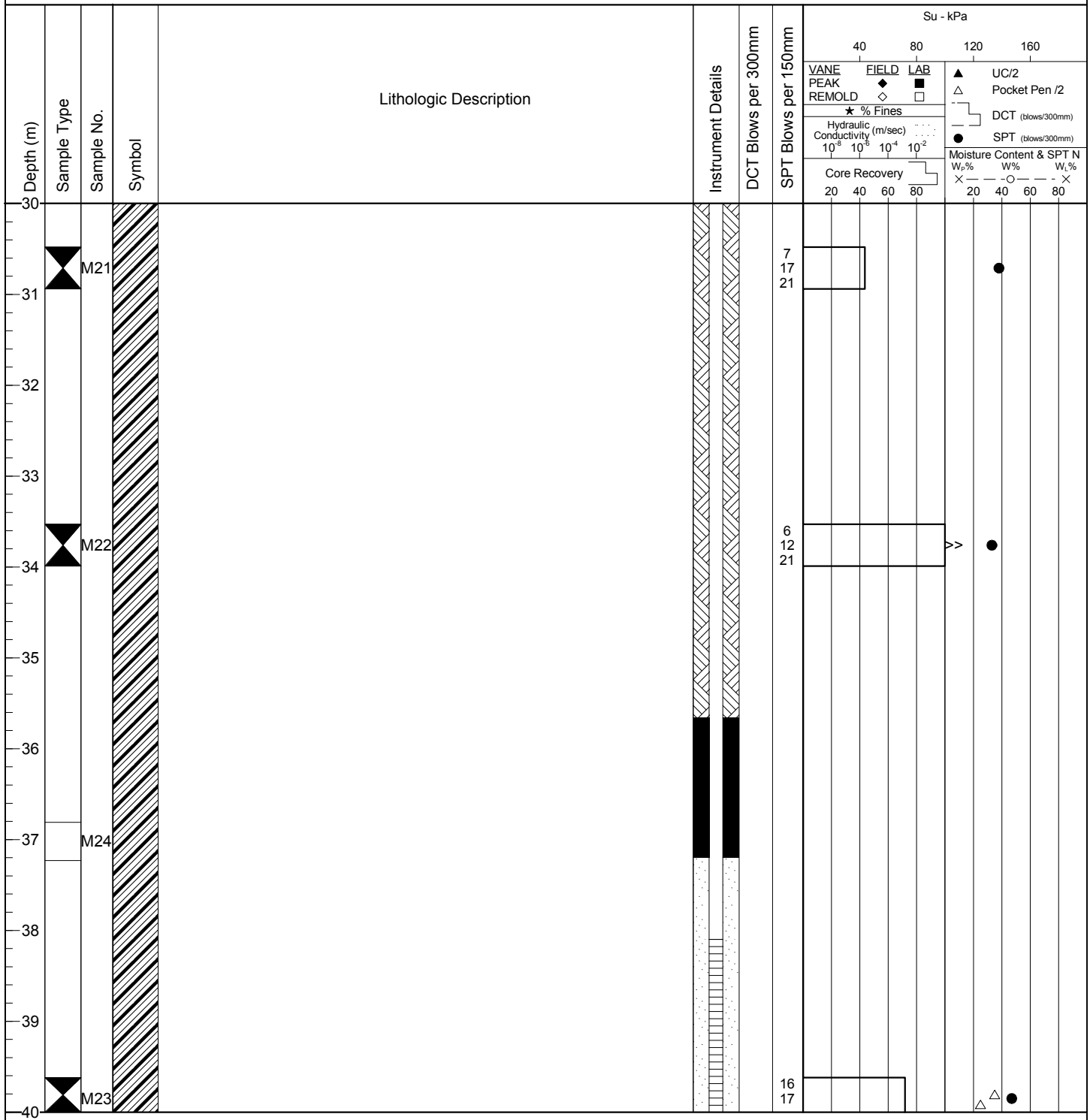
Su - kPa: 40, 80, 120, 160
VANE PEAK / FIELD ◆ / LAB ■ / REMOLD ◇ / □
▲ UC/2
△ Pocket Pen /2
★ % Fines
Hydraulic Conductivity (m/sec) 10^{-8} 10^{-6} 10^{-4} 10^{-2}
DCT (blows/300mm)
● SPT (blows/300mm)
Core Recovery 20 40 60 80
Moisture Content & SPT N
W_P% W% W_L% 20 40 60 80

(Continued on next page)

Survey Method: Handheld GPS
Co-ordinates (m): 683,791E, 5,611,053N
Ground Elevation (m): 978
Datum: NAD83
Dip (degrees from horizontal): 90
Direction: n/a

Drill Designation: Fraste MD-XL
Drilling Contractor: Geotech Drilling
Drill Method: ODEX/Triple Tube
Core: HQ3
Fluid: Water
Casing: HWT **Cased To (m):** 41.15

Start Date: 27 Apr 13
Finish Date: 30 Apr 13
Final Depth of Hole (m): 52.80
Depth to Top of Rock (m): 40.23
Logged by: MPL
Reviewed by: AKU



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Survey Method: Handheld GPS
Co-ordinates (m): 683,791E, 5,611,053N
Ground Elevation (m): 978
Datum: NAD83
Dip (degrees from horizontal): 90
Direction: n/a

Drill Designation: Fraste MD-XL
Drilling Contractor: Geotech Drilling
Drill Method: ODEX/Triple Tube
Core: HQ3
Fluid: Water
Casing: HWT **Cased To (m):** 41.15

Start Date: 27 Apr 13
Finish Date: 30 Apr 13
Final Depth of Hole (m): 52.80
Depth to Top of Rock (m): 40.23
Logged by: MPL
Reviewed by: AKU

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details	DCT Blows per 300mm	SPT Blows per 150mm
40				Rock encountered at 40.23 m depth. See BGC13-014 rock log.			30
41							
42							
43							
44							
45							
46							
47							
48							
49							
50							

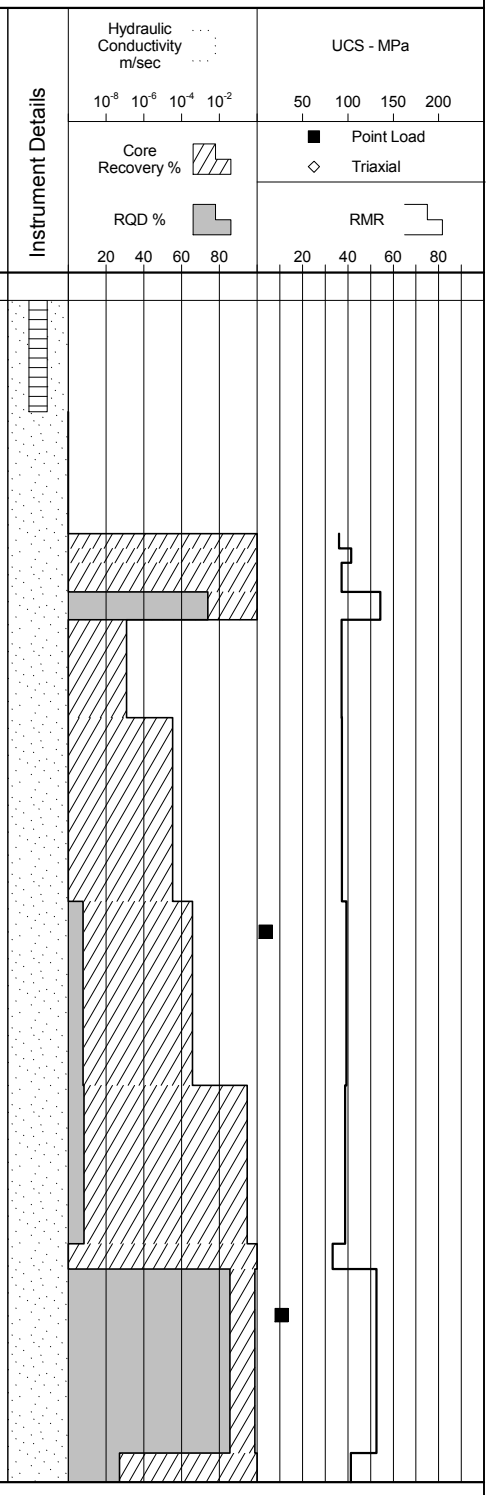
Su - kPa
40 80 120 160
VANE FIELD LAB
PEAK ◆ ■
REMOLD ◇ □
▲ UC/2
△ Pocket Pen /2
★ % Fines
Hydraulic Conductivity (m/sec)
10^{-8} 10^{-6} 10^{-4} 10^{-2}
DCT (blows/300mm)
● SPT (blows/300mm)
Core Recovery
20 40 60 80
Moisture Content & SPT N
W_P% W% W_L%
20 40 60 80

Survey Method :Handheld GPS
Co-ordinates (m) : 683,791E, 5,611,053N
Ground Elevation (m) : 978
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste MD-XL
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/Triple Tube
Core : HQ3
Fluid : Water
Casing : HWT **Cased To (m)** : 41.15

Start Date : 27 Apr 13
Finish Date : 30 Apr 13
Final Depth of Hole (m) : 52.80
Depth to Top of Rock (m) : 40.23
Logged by : MPL
Reviewed by : AKU

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description	Instrument Details
40					0 to 40.23 m - See BGC13-014 soil log.	
41					BEDROCK Dark greyish green, fine to medium grained, uniform with some microfractured and stockwork zones, medium strong (R3), slightly to moderately weathered (W2-W3), 4 joint sets at 65°, 60°, 22°, 20°, to core axis, calcite and crushed rock infill, joints are planar, smooth to rough highly fractured. [CHERRY CREEK UNIT] From 41.15 m to 42.16 m - no recovery.	
42			2		From 42.28 m to 42.40 m - stockwork, calcite present on unhealed joints, highly fractured.	
			2			
			3			
			2.5		At 42.35 m - joint at 30° to core axis, calcite infill, 2.5 mm thick, planar, smooth.	
43			2.5		From 42.64 m to 42.87 m - stockwork, calcite present on unhealed joints. From 42.87 m to 45.97 m - highly fractured rock.	
44			2.5			
45			2.5			
46			2.5		From 45.97 m to 46.72 m - stockwork, calcite infill, < 1 mm to 3 mm thick, highly fractured zone.	
47			2.5			
48			2.5		At 48.10 m - reddish brown coating on subparallel joint, smooth, very weak (R1).	
49			2			
50						



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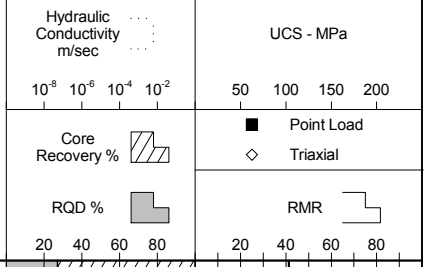
Survey Method :Handheld GPS
Co-ordinates (m) : 683,791E, 5,611,053N
Ground Elevation (m) : 978
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste MD-XL
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/Triple Tube
Core : HQ3
Fluid : Water
Casing : HWT **Cased To (m)** : 41.15

Start Date : 27 Apr 13
Finish Date : 30 Apr 13
Final Depth of Hole (m) : 52.80
Depth to Top of Rock (m) : 40.23
Logged by : MPL
Reviewed by : AKU

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
50			2		At 50.13 m and 50.38 m - bluish green coating on joint surfaces, undulating, smooth, extremely weak, 40° to core axis, < 2 mm thick.
					At 50.57 m - calcite infill, 20° to core axis, 6 mm thick, planar to undulating, smooth to rough.
51			2.5		
					At 51.20 m - slickensides, reddish brown staining on joint, 15° to core axis, stepped, smooth to rough.
52			2.5		
					Below 52.20 m - medium grained, pyrite flecks.
					At 52.44 m - healed quartz vein.
53					END OF HOLE AT 52.80 m
					Notes: 1. 2.5" PVC standpipe piezometer installed with screen from 38.10 to 41.15 m. 2. Filter sand placed from 37.20 to 50.82 m. 3. Bentonite seal placed from 35,66 to 37.20 m and hydrated with water. 4. Water level measured on May 11, 2013: 21.67 m below ground surface. 5. SPT hammer type: Automatic trip, 140 lbs. N values shown are uncorrected.
54					
55					
56					
57					
58					
59					
60					

Instrument Details



Survey Method: Handheld GPS
Co-ordinates (m): 683,850E, 5,610,990N
Ground Elevation (m): 983
Datum: NAD83
Dip (degrees from horizontal): 90
Direction: n/a

Drill Designation: Fraste MD-XL
Drilling Contractor: Geotech Drilling
Drill Method: ODEX/Triple Tube
Core: HQ3
Fluid: Water
Casing: HWT **Cased To (m):** 38.1

Start Date: 06 May 13
Finish Date: 08 May 13
Final Depth of Hole (m): 48.16
Depth to Top of Rock (m): 36.71
Logged by: SLP
Reviewed by: AKU

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details	DCT Blows per 300mm	SPT Blows per 150mm
0							1
		M1		ORGANICS Organic silt, grasses, trace rootlets, < 1 mm diameter.			2
				SILT (ML) Some sand, trace gravel, trace clay, firm, dark brown, no odour, dry, homogeneous, no cementation, rapid to slow dilatancy, sand is fine, gravel is multi-lithic, maximum particle size is 10 mm, flat and elongated, subrounded. [TILL]			3
1							
		M2		GRAVEL (GM) Fine to course, sandy, some silt, trace clay, very dense, well graded, maximum particle size is 25 mm, equant, subangular to subrounded, light brown with grey clasts, no odour, dry, homogeneous, no cementation, multi-lithic. [TILL]			14 26 29
2							
3		M3		SILT (ML) Some gravel to gravelly, some sand, trace clay, low plasticity, hard, light brown with grey clasts, no odour, dry, homogeneous, no cementation, slow to rapid dilatancy, sand is fine, gravel is subangular. [TILL]			20 28 28
4							
5		M4					19 27 30
6							
		M5		Below 6.10 m - decrease in gravel content.			11 18 26
7							
		M6		Below 7.62 m - slightly darker brown.			12 21 19
8							
9							
		M7		Below 9.14 m - increase in clay content to some, moist, slow dilatancy, gravel is subrounded and elongated.			16 22 R
10							

Su - kPa
40 80 120 160
VANE FIELD LAB
PEAK ◆ ■
REMOLD ◇ □
▲ UC/2
△ Pocket Pen /2
★ % Fines
DCT (blows/300mm)
SPT (blows/300mm)
Hydraulic Conductivity (m/sec)
10^{-8} 10^{-6} 10^{-4} 10^{-2}
Moisture Content & SPT N
W_P% W% W_L%
Core Recovery
20 40 60 80
20 40 60 80

(Continued on next page)

Survey Method: Handheld GPS
Co-ordinates (m): 683,850E, 5,610,990N
Ground Elevation (m): 983
Datum: NAD83
Dip (degrees from horizontal): 90
Direction: n/a

Drill Designation: Fraste MD-XL
Drilling Contractor: Geotech Drilling
Drill Method: ODEX/Triple Tube
Core: HQ3
Fluid: Water
Casing: HWT **Cased To (m):** 38.1

Start Date: 06 May 13
Finish Date: 08 May 13
Final Depth of Hole (m): 48.16
Depth to Top of Rock (m): 36.71
Logged by: SLP
Reviewed by: AKU

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details	DCT Blows per 300mm	SPT Blows per 150mm
10							
11		M8					10 18 27
12		M9		Below 12.19 m - some clay to clayey, trace gravel.			11 19 23
13							
14		M10					12 20 33
15		M11					13 R
16							
17		M12		Below 16.76 m - clayey, medium plasticity, grey.			9 24 34
18							
19		M13		SAND (SW) Fine, trace silt, trace clay, well graded, dense, light brown, moist, homogeneous, no cementation. [TILL]			12 18 18
20				SILT (SM)			8

Su - kPa: 40, 80, 120, 160
VANE PEAK ◆ REMOLD ◇ | FIELD ■ | LAB □
▲ UC/2
△ Pocket Pen /2
★ % Fines
Hydraulic Conductivity (m/sec) 10^{-8} 10^{-6} 10^{-4} 10^{-2}
DCT (blows/300mm)
● SPT (blows/300mm)
Core Recovery 20 40 60 80
Moisture Content & SPT N
W_P% W% W_L% 20 40 60 80

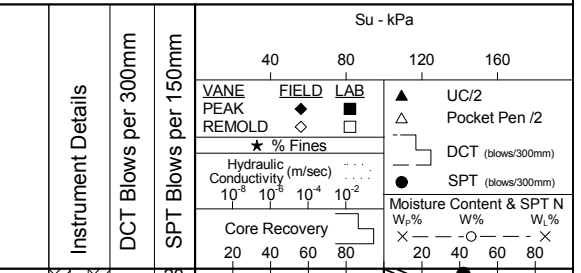
(Continued on next page)

Survey Method: Handheld GPS
Co-ordinates (m): 683,850E, 5,610,990N
Ground Elevation (m): 983
Datum: NAD83
Dip (degrees from horizontal): 90
Direction: n/a

Drill Designation: Fraste MD-XL
Drilling Contractor: Geotech Drilling
Drill Method: ODEX/Triple Tube
Core: HQ3
Fluid: Water
Casing: HWT **Cased To (m):** 38.1

Start Date: 06 May 13
Finish Date: 08 May 13
Final Depth of Hole (m): 48.16
Depth to Top of Rock (m): 36.71
Logged by: SLP
Reviewed by: AKU

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details	DCT Blows per 300mm	SPT Blows per 150mm
20		M14		Sandy, some clay, trace to some gravel, high plasticity, hard, light brown, no odour, slightly moist, homogeneous, no cementation, slow dilatancy, gravel is fine, maximum particle size is 15 mm, subangular. [TILL]			20 22
21							
22		M15		CLAY (CH) Silty, some gravel, some sand, high plasticity, very stiff, greyish brown, no odour, homogeneous, no cementation, slow dilatancy, gravel is coarse, maximum particle size is 30 mm, flat, subrounded, sand is fine. [TILL]			7 12 16
23		M16		Below 22.86 m - hard.			9 17 23
24							
25		M17					8 16 28
26		M18		Below 25.91 m - trace fine sand.			9 20 24
27							
28		M19					8 15 22
29							
30							



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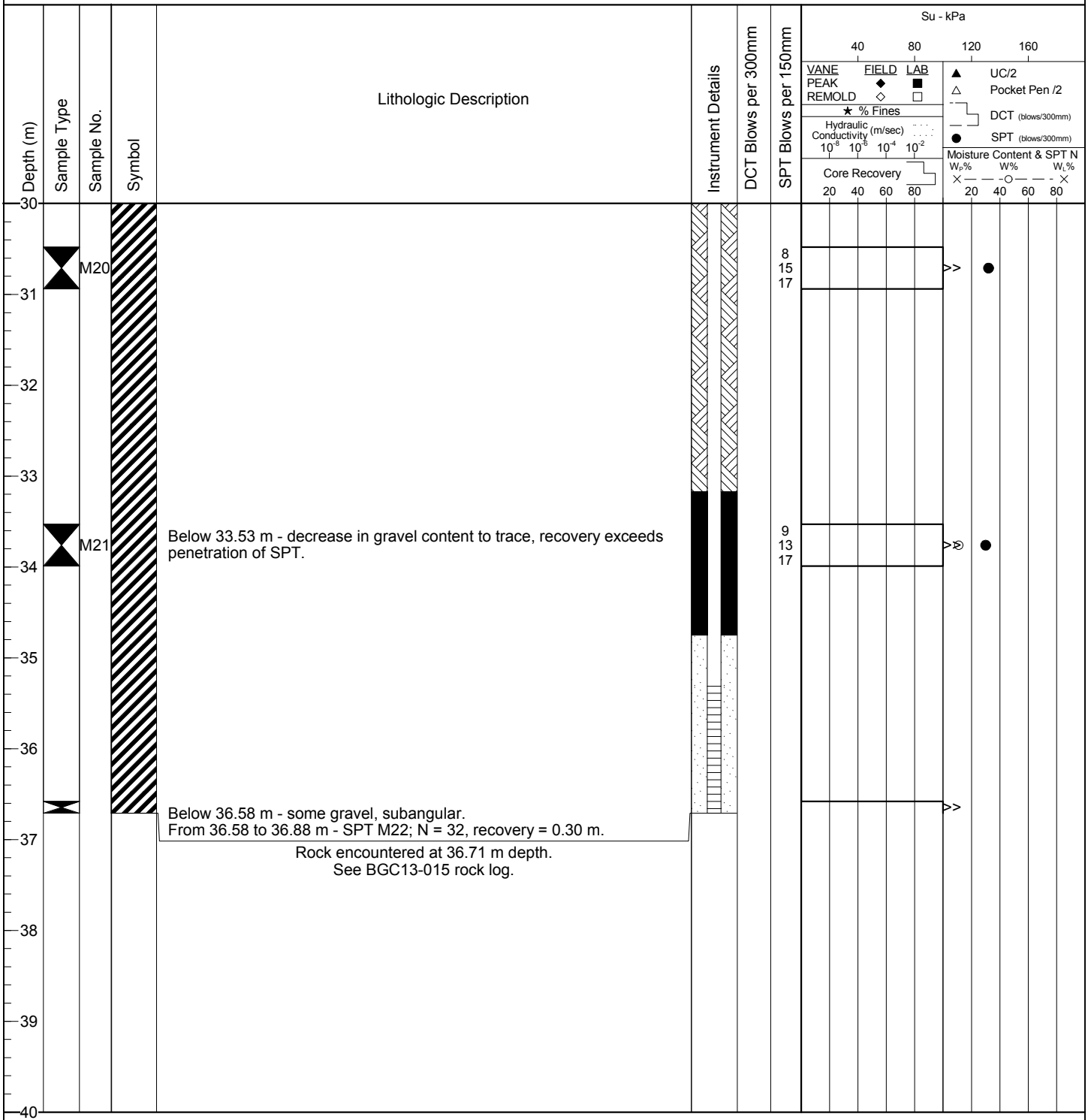
Survey Method: Handheld GPS
Co-ordinates (m): 683,850E, 5,610,990N
Ground Elevation (m): 983
Datum: NAD83
Dip (degrees from horizontal): 90
Direction: n/a

Drill Designation: Fraste MD-XL
Drilling Contractor: Geotech Drilling
Drill Method: ODEX/Triple Tube
Core: HQ3
Fluid: Water
Casing: HWT **Cased To (m):** 38.1

Start Date: 06 May 13
Finish Date: 08 May 13
Final Depth of Hole (m): 48.16
Depth to Top of Rock (m): 36.71
Logged by: SLP
Reviewed by: AKU



Survey Method :Handheld GPS
Co-ordinates (m) : 683,850E, 5,610,990N
Ground Elevation (m) : 983
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste MD-XL
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/Triple Tube
Core : HQ3
Fluid : Water
Casing : HWT **Cased To (m)** : 38.1

Start Date : 06 May 13
Finish Date : 08 May 13
Final Depth of Hole (m) : 48.16
Depth to Top of Rock (m) : 36.71
Logged by : SLP
Reviewed by : AKU

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description	Instrument Details
30					0 to 36.71 m - See BGC13-015 soil log.	
31						
32						
33						
34						
35						
36						
37		M22			BEDROCK Light green, coarse grained, microfractured, very weak to medium strong (R1-R3), slightly to highly weathered (W2-W4), calcitic rock. [CHERRY CREEK UNIT]	
38			3		Below 38.10 m - discontinuities occurring at 30° to 45° to core axis, highly fractured zones throughout, weak (R2), slightly weathered (W2).	
39			2		Below 39.01 m - discontinuities at 45° to core axis, white clay, calcite and crushed rock infill, medium strong (R3), slightly weathered (W2).	
40						

Hydraulic Conductivity m/sec: 10^{-8} 10^{-6} 10^{-4} 10^{-2}
Core Recovery %
RQD %: 20 40 60 80
UCS - MPa: 50 100 150 200
Point Load
Triaxial
RMR: 20 40 60 80

(Continued on next page)

Survey Method :Handheld GPS
Co-ordinates (m) : 683,850E, 5,610,990N
Ground Elevation (m) : 983
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste MD-XL
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/Triple Tube
Core : HQ3
Fluid : Water
Casing : HWT **Cased To (m)** : 38.1

Start Date : 06 May 13
Finish Date : 08 May 13
Final Depth of Hole (m) : 48.16
Depth to Top of Rock (m) : 36.71
Logged by : SLP
Reviewed by : AKU

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
40					
			2		Below 40.54 m - discontinuities at 60° to 75° to core axis.
41					
42					
			2		Below 42.06 m - discontinuities ranging from 5°-75° to core axis. Below 42.46 m - joint at approximately 5° to core axis with intense crystallization, JRC = 16.
43					
		R1			
			2		From 43.59 m - discontinuities ranging from 0° to 45° to core axis, with calcite infill.
44					
45					
			2		Below 45.11 m - discontinuities ranging from 25° to 82° to core axis, one joint set oriented 25° to core axis, with calcite, decomposed and crushed rock infill, discontinuities from 45.64 m until 45.91 m occurring at 10 mm frequency.
46					
47					
			2		Below 46.63 m - highly fractured, discontinuities ranging from 45° to 65° to core axis.
48					Below 47.7 m - stockwork of quartz veins and microfractured fabric, highly fractured.
					END OF HOLE AT 48.16 m
49					Notes: 1. 2.5" PVC standpipe piezometer installed with screen from 35.31 to 38.35 m. 2. Filter sand placed from 34.75 to 39.01 m. 3. Bentonite seal placed from 33.17 to 34.75 m and hydrated with water. 4. Water level measured on May 11, 2013: 21.87 m from ground
50					

Instrument Details

Hydraulic Conductivity m/sec: 10^{-8} 10^{-6} 10^{-4} 10^{-2}
Core Recovery %
RQD %
20 40 60 80

UCS - MPa: 50 100 150 200
Point Load
Triaxial
RMR: 20 40 60 80

(Continued on next page)

Survey Method :Handheld GPS
Co-ordinates (m) : 683,850E, 5,610,990N
Ground Elevation (m) : 983
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste MD-XL
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/Triple Tube
Core : HQ3
Fluid : Water
Casing : HWT **Cased To (m)** : 38.1

Start Date : 06 May 13
Finish Date : 08 May 13
Final Depth of Hole (m) : 48.16
Depth to Top of Rock (m) : 36.71
Logged by : SLP
Reviewed by : AKU

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description	Instrument Details	Hydraulic Conductivity m/sec (10^{-8} 10^{-6} 10^{-4} 10^{-2}) / Core Recovery % / RQD % (20 40 60 80)	UCS - MPa (50 100 150 200) ■ Point Load ◇ Triaxial / RMR (20 40 60 80)
50					surface. 5. SPT hammer type: Automatic trip, 140 lbs. N values shown are uncorrected.			
51								
52								
53								
54								
55								
56								
57								
58								
59								
60								

Survey Method: Handheld GPS
Co-ordinates (m): 683,791E, 5,610,949N
Ground Elevation (m): 986
Datum: NAD83
Dip (degrees from horizontal): 90
Direction: n/a

Drill Designation: Fraste MD-XL
Drilling Contractor: Geotech Drilling
Drill Method: ODEX/Triple Tube
Core: HQ3
Fluid: Water
Casing: HWT **Cased To (m):** 27.43

Start Date: 08 May 13
Finish Date: 09 May 13
Final Depth of Hole (m): 37.49
Depth to Top of Rock (m): 26.21
Logged by: SLP/CDM
Reviewed by: AKU

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details	DCT Blows per 300mm	SPT Blows per 150mm
0				ORGANICS Vegetation, grasses, trace rootlets < 1 mm diameter.			1
		M1		SILT (ML) Sandy, trace clay, trace gravel, no plasticity, stiff, dark brown, no odour, dry, homogeneous, no cementation, rapid dilatancy, sand is fine. [TILL]			4 6
1							
		M2		SAND (SM) Fine, silty, clayey, some gravel, well graded, very dense, maximum particle size is 30 mm, flat, subangular, light brown with grey clasts, no odour, dry, homogeneous, no cementation, multi-lithic. [TILL]			24 26 26
2							
3		M3		Below 3.05 m - dense, subrounded, medium brown, slight iron oxidation on clasts. Below 3.28 m - moist.			13 21 25
4							
		M4		From 4.57 to 5.03 m - Particle Size Analysis: 17% gravel, 36% sand, 47% fines.			8 17 23
5							
6							
		M5		SILT (ML) Sandy, some gravel, trace clay, low plasticity, hard, medium brown, no odour, moist, homogeneous, no cementation, slow to rapid dilatancy, sand is fine, gravel is fine, maximum particle size is 20 mm, flat, rounded. [TILL]			16 18 21
7							
		M6					R
8							
9							
		M7		CLAY and SAND (CI/SM) Silty, some gravel, medium plasticity, very stiff, medium brown, no odour, moist, homogeneous, no cementation, slow dilatancy, gravel is coarse, maximum particle size is 25 mm, flat, subrounded.			6 12 14
10							

Su - kPa: 40, 80, 120, 160
VANE PEAK / FIELD ◆ / LAB ■ / REMOLD ◇ □
UC/2 ▲ Pocket Pen /2 △
★ % Fines
Hydraulic Conductivity (m/sec) 10^{-8} 10^{-6} 10^{-4} 10^{-2}
DCT (blows/300mm)
SPT (blows/300mm) ●
Core Recovery 20 40 60 80
Moisture Content & SPT N W_P% W% W_L% 20 40 60 80

(Continued on next page)

Survey Method: Handheld GPS
Co-ordinates (m): 683,791E, 5,610,949N
Ground Elevation (m): 986
Datum: NAD83
Dip (degrees from horizontal): 90
Direction: n/a

Drill Designation: Fraste MD-XL
Drilling Contractor: Geotech Drilling
Drill Method: ODEX/Triple Tube
Core: HQ3
Fluid: Water
Casing: HWT **Cased To (m):** 27.43

Start Date: 08 May 13
Finish Date: 09 May 13
Final Depth of Hole (m): 37.49
Depth to Top of Rock (m): 26.21
Logged by: SLP/CDM
Reviewed by: AKU

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details	DCT Blows per 300mm	SPT Blows per 150mm
10				[TILL]			7
11		M8		From 10.66 to 11.12 m - Particle Size Analysis: 19% gravel, 37% sand, 44% fines.			11 14
12		M9					11 13 19
13							
14		M10		Below 13.72 m - clayey, greyish brown.			6 13 15
15					▼		
16		M11		Below 15.25 m - hard.			7 15 20
17		M12					8 17 23
18							
19		M13					14 19 24
20				CLAY (CL)			8

Su - kPa: 40, 80, 120, 160
VANE PEAK / REMOLD — FIELD ◆ ◇ — LAB ■ □
▲ UC/2
△ Pocket Pen /2
★ % Fines
Hydraulic Conductivity (m/sec) 10^{-8} 10^{-6} 10^{-4} 10^{-2}
DCT (blows/300mm)
● SPT (blows/300mm)
Core Recovery: 20 40 60 80
Moisture Content & SPT N: W_P% W% W_L%: 20 40 60 80

(Continued on next page)

Survey Method: Handheld GPS
Co-ordinates (m): 683,791E, 5,610,949N
Ground Elevation (m): 986
Datum: NAD83
Dip (degrees from horizontal): 90
Direction: n/a

Drill Designation: Fraste MD-XL
Drilling Contractor: Geotech Drilling
Drill Method: ODEX/Triple Tube
Core: HQ3
Fluid: Water
Casing: HWT **Cased To (m):** 27.43

Start Date: 08 May 13
Finish Date: 09 May 13
Final Depth of Hole (m): 37.49
Depth to Top of Rock (m): 26.21
Logged by: SLP/CDM
Reviewed by: AKU

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description
20		M14		Silty, some sand, some gravel, low plasticity, very stiff to hard, light brownish grey, no odour, moist, homogeneous, no cementation, slow dilatancy, gravel is coarse, maximum particle size is 30 mm, flat, subrounded, multi-lithic. [TILL]
21				
		M15		Below 21.34 m - trace sand, trace gravel, dark grey.
22				
23		M16		Below 23.23 m - some sand.
24				
		M17		SILT (ML) Sandy, some clay, low plasticity, hard, light brown, no odour, laminated, no cementation, rapid dilatancy. [TILL]
25				
26		M18		At 25.91 m - clayey, refusal on bedrock.
				Rock encountered at 26.21 m depth. See BGC13-016 rock log.
27				
28				
29				
30				

Instrument Details

DCT Blows per 300mm

SPT Blows per 150mm: 15, 14 | 11, 14, 18 | 9, 19, 36 | 17, 21, 38 | R

Su - kPa: 40, 80, 120, 160
VANE PEAK / REMOLD — FIELD / LAB
UC/2
Pocket Pen /2
DCT (blows/300mm)
SPT (blows/300mm)
★ % Fines
Hydraulic Conductivity (m/sec) 10^{-8} 10^{-6} 10^{-4} 10^{-2}
Core Recovery: 20, 40, 60, 80
Moisture Content & SPT N: W_P% W% W_L%: 20, 40, 60, 80

Survey Method :Handheld GPS
Co-ordinates (m) : 683,791E, 5,610,949N
Ground Elevation (m) : 986
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste MD-XL
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/Triple Tube
Core : HQ3
Fluid : Water
Casing : HWT **Cased To (m)** : 27.43

Start Date : 08 May 13
Finish Date : 09 May 13
Final Depth of Hole (m) : 37.49
Depth to Top of Rock (m) : 26.21
Logged by : SLP/CDM
Reviewed by : AKU

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
20–26					0 to 26.21 m - See BGC13-016 soil log.
26–30			3		BEDROCK Light green, medium grained, microfractured, 2 joint sets at 27° and 70° to core axis, average joint condition is 12, weak (R2), moderately weathered (W3). [CHERRY CREEK UNIT] Below 28.35 m - discontinuities ranging from 34° to 88° to core axis.

Instrument Details

Hydraulic Conductivity m/sec: 10^{-8} 10^{-6} 10^{-4} 10^{-2}

Core Recovery %

RQD %: 20 40 60 80

UCS - MPa: 50 100 150 200

Point Load

Triaxial

RMR: 20 40 60 80

(Continued on next page)

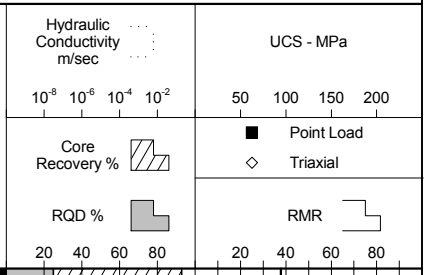
Survey Method :Handheld GPS
Co-ordinates (m) : 683,791E, 5,610,949N
Ground Elevation (m) : 986
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste MD-XL
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/Triple Tube
Core : HQ3
Fluid : Water
Casing : HWT **Cased To (m)** : 27.43

Start Date : 08 May 13
Finish Date : 09 May 13
Final Depth of Hole (m) : 37.49
Depth to Top of Rock (m) : 26.21
Logged by : SLP/CDM
Reviewed by : AKU

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
30			3		Below 29.87 m - discontinuities ranging from 35° to 84° to core axis, joints along quarts veins.
31					
32			3		Below 31.39 m - discontinuities ranging from 25° to 83° to core axis.
33			2		Below 32.92 m - discontinuities ranging from 35° to 84° to core axis. At 33.21 m - joint almost parallel to core axis.
34					At 33.48 m - shear on a vein, slickensided with a 3 mm aperture, decomposed and crushed rock infill with iron oxidation, occurring at 29° to core axis.
35			2		
36			3		At 35.90 m - joint along a vein, occurring at 7° to core axis, black, soft clay infill. From 35.97 to 37.10 m - highly weathered decomposed rock, possible fault zone. At 36.37 m - shear at 19° to core axis, crushed rock, iron oxide staining and clay infill, JRC = 2.
37		R1			At 36.76 m - minor fault, crushed rock, broken rock and quartz infill, hanging wall oriented at 80° to core axis.
38					END OF HOLE AT 37.49 m Notes: 1. 2" PVC standpipe piezometer installed with screen from 24.31 to 27.36 m. 2. Filter sand placed from 23.77 to 28.04 m. 3. Bentonite seal placed from 22.17 to 23.77 m and hydrated with water. 4. Water level measured on May 11, 2013: 15.38 m below ground surface. 5. SPT hammer type: Automatic trip, 140 lbs. N values shown are uncorrected.
39					
40					

Instrument Details



BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: KGHM International Ltd.

Survey Method: Handheld GPS
Co-ordinates (m): 683,991E, 5,610,940N
Ground Elevation (m): 986
Datum: NAD83
Dip (degrees from horizontal): 90
Direction: n/a

Drill Designation: Fraste MD-XL
Drilling Contractor: Geotech Drilling
Drill Method: ODEX/Triple Tube
Core: HQ3
Fluid: Water
Casing: HWT **Cased To (m):** 38.1

Start Date: 09 May 13
Finish Date: 11 May 13
Final Depth of Hole (m): 48.16
Depth to Top of Rock (m): 36.88
Logged by: SLP
Reviewed by: AKU

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details	DCT Blows per 300mm	SPT Blows per 150mm
0		M1		ORGANICS Organic silt, vegetation, grasses, trace rootlets < 1 mm diameter.			1 3 6
1				SAND and GRAVEL (SW-GW) Some silt, trace clay, well graded, dense, maximum particle size is 25 mm, equant, subrounded, light brown and grey clasts, no odour, dry, homogeneous, no cementation, multi-lithic. [TILL]			
2		M2					14 18 39
3		M3					11 15 19
4							
5		M4		SILT (ML) Sandy, gravelly, trace clay, low plasticity, very stiff, medium brown, no odour, dry, homogeneous, no cementation, rapid dilatancy, sand is fine, gravel is coarse, maximum particle size is 30 mm, elongated, subrounded. [TILL] From 4.57 to 5.03 m - Particle Size Analysis: 27% gravel, 33% sand, 40% fines.			7 14 23
6		M5		At 6.10 m - no recovery of SPT.			11 14 15
7							
8		M6		SAND (SW) Fine to medium, some gravel, trace silt, well graded, dense, maximum particle size is 25 mm, elongated, subrounded, reddish brown to brown, no odour, moist, homogeneous, no cementation, gravel is coarse, multi-lithic. [TILL]			18 37 19
9		M7		SILT (ML) Some sand, some gravel, trace clay, medium plasticity, hard, dark brown, no odour, slightly moist, homogeneous, no cementation, rapid dilatancy, sand is fine, gravel is coarse, maximum particle size is 30 mm, elongated, subangular. [TILL]			8 12 17
10							

Su - kPa: 40, 80, 120, 160
VANE PEAK ◆ REMOLD ◇ FIELD ■ LAB □
▲ UC/2
△ Pocket Pen /2
★ % Fines
Hydraulic Conductivity (m/sec) 10^{-8} 10^{-6} 10^{-4} 10^{-2}
DCT (blows/300mm)
● SPT (blows/300mm)
Core Recovery 20 40 60 80
Moisture Content & SPT N
W_P% W% W_L% 20 40 60 80

(Continued on next page)

Survey Method: Handheld GPS
Co-ordinates (m): 683,991E, 5,610,940N
Ground Elevation (m): 986
Datum: NAD83
Dip (degrees from horizontal): 90
Direction: n/a

Drill Designation: Fraste MD-XL
Drilling Contractor: Geotech Drilling
Drill Method: ODEX/Triple Tube
Core: HQ3
Fluid: Water
Casing: HWT **Cased To (m):** 38.1

Start Date: 09 May 13
Finish Date: 11 May 13
Final Depth of Hole (m): 48.16
Depth to Top of Rock (m): 36.88
Logged by: SLP
Reviewed by: AKU

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description
11		M8		
12		M9		Below 12.19 m - trace to some clay.
14		M10		Below 13.72 m - trace gravel.
15		M11		Below 15.24 m - increase in moisture content.
17		M12		Below 16.76 m - very stiff, dark grey, slow to rapid dilatancy.
18		M13		Below 18.29 m - gravel is subrounded.
20				Below 19.81 m - clayey, hard.

Instrument Details

DCT Blows per 300mm

SPT Blows per 150mm: 12 16 19 | 8 15 19 | 13 20 21 | 7 15 29 | 8 11 17 | 14 19 21 | 10

Su - kPa: 40 80 120 160
VANE PEAK / REMOLD; FIELD ◆ ◇; LAB ■ □
▲ UC/2
△ Pocket Pen /2
★ % Fines
Hydraulic Conductivity (m/sec) 10^{-8} 10^{-6} 10^{-4} 10^{-2}
DCT (blows/300mm)
● SPT (blows/300mm)
Core Recovery 20 40 60 80
Moisture Content & SPT N: W_P% W% W_L% 20 40 60 80

(Continued on next page)

Survey Method: Handheld GPS
Co-ordinates (m): 683,991E, 5,610,940N
Ground Elevation (m): 986
Datum: NAD83
Dip (degrees from horizontal): 90
Direction: n/a

Drill Designation: Fraste MD-XL
Drilling Contractor: Geotech Drilling
Drill Method: ODEX/Triple Tube
Core: HQ3
Fluid: Water
Casing: HWT **Cased To (m):** 38.1

Start Date: 09 May 13
Finish Date: 11 May 13
Final Depth of Hole (m): 48.16
Depth to Top of Rock (m): 36.88
Logged by: SLP
Reviewed by: AKU

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details	DCT Blows per 300mm	SPT Blows per 150mm
20		M14					14 19
21							
		M15					6 19 27
22							
23		M16		Below 22.86 m - some gravel, flat.			11 16 R
24							
		M17					6 14 18
25							
26		M18		CLAY (CH) Silty, trace sand, high plasticity, very stiff, light brown, no odour, slightly moist, laminated, no cementation, high dry strength, slow dilatancy, sand is fine. [TILL]			7 10 15
27				SILT (ML) Clayey, some sand, trace to some gravel, low plasticity, very stiff, dark brown, no odour, moist, homogeneous, no cementation, slow dilatancy, sand is fine, gravel is fine, maximum particle size is 20 mm, equant, subrounded. [TILL]			
28							
29		M19		Below 28.96 m - dark grey.			6 17 24
30							

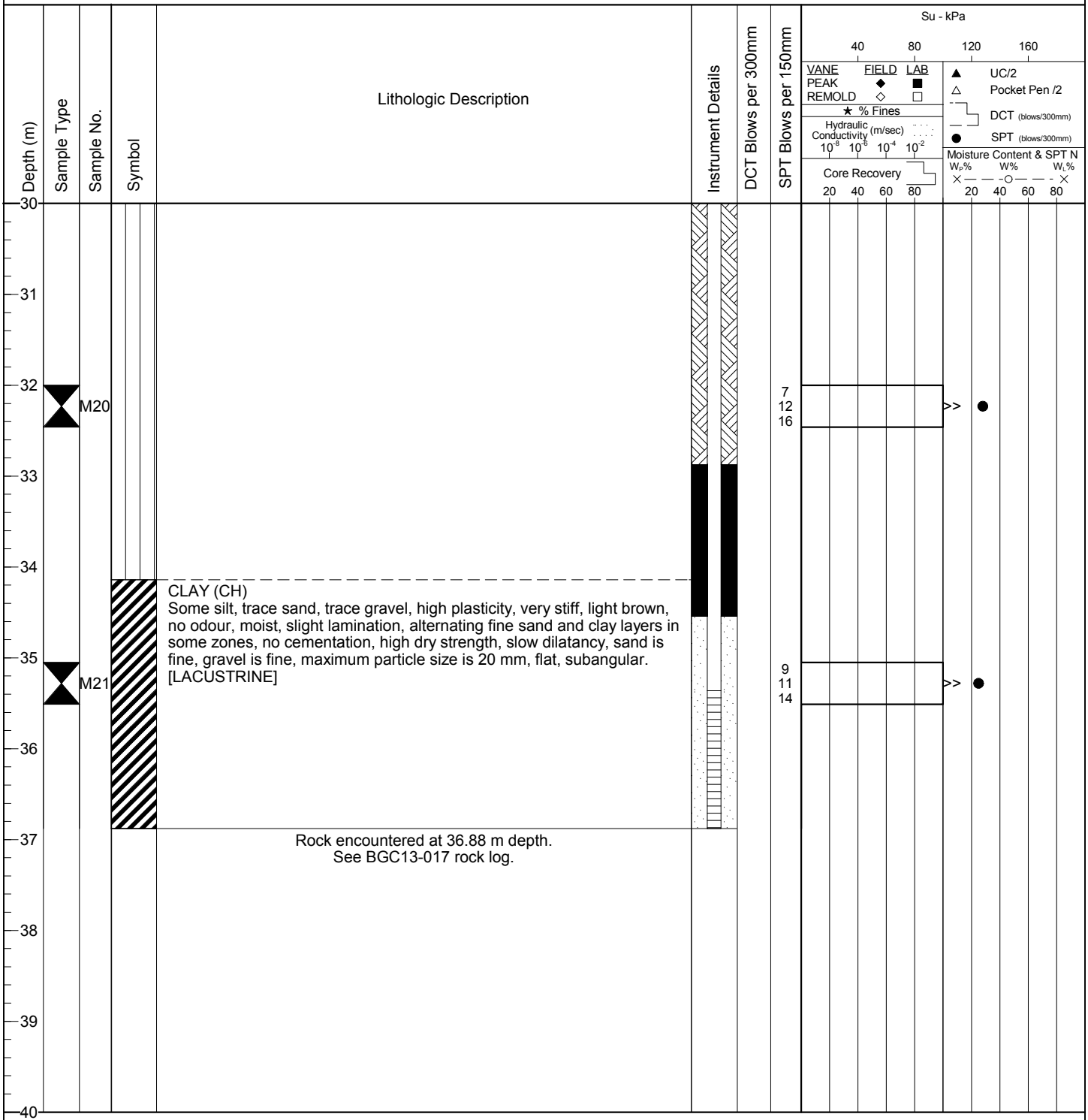
Su - kPa: 40, 80, 120, 160
VANE PEAK REMOLD — FIELD ◆ ◇ — LAB ■ □
▲ UC/2
△ Pocket Pen /2
★ % Fines
Hydraulic Conductivity (m/sec) 10^{-8} 10^{-6} 10^{-4} 10^{-2}
DCT (blows/300mm)
● SPT (blows/300mm)
Core Recovery 20 40 60 80
Moisture Content & SPT N
W_P% W% W_L% 20 40 60 80

(Continued on next page)

Survey Method: Handheld GPS
Co-ordinates (m): 683,991E, 5,610,940N
Ground Elevation (m): 986
Datum: NAD83
Dip (degrees from horizontal): 90
Direction: n/a

Drill Designation: Fraste MD-XL
Drilling Contractor: Geotech Drilling
Drill Method: ODEX/Triple Tube
Core: HQ3
Fluid: Water
Casing: HWT **Cased To (m):** 38.1

Start Date: 09 May 13
Finish Date: 11 May 13
Final Depth of Hole (m): 48.16
Depth to Top of Rock (m): 36.88
Logged by: SLP
Reviewed by: AKU



Survey Method :Handheld GPS
Co-ordinates (m) : 683,991E, 5,610,940N
Ground Elevation (m) : 986
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste MD-XL
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/Triple Tube
Core : HQ3
Fluid : Water
Casing : HWT **Cased To (m)** : 38.1

Start Date : 09 May 13
Finish Date : 11 May 13
Final Depth of Hole (m) : 48.16
Depth to Top of Rock (m) : 36.88
Logged by : SLP
Reviewed by : AKU

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description	Instrument Details
30					0 to 36.88 m - See BGC13-017 soil log.	
37					BEDROCK Green, medium grained, microfractured, weak to medium strong (R2-R3), moderately weathered (W3), 2 joint sets at 40° and 75° to core axis, average joint condition is 12. [CHERRY CREEK UNIT]	
38			3			
39			3		Below 39.01 m - discontinuities ranging from 40° to 75° to core axis, soft discontinuity walls, crushed and decomposed rock infill, quartz veining throughout.	
40						

Hydraulic Conductivity m/sec: 10^{-8} 10^{-6} 10^{-4} 10^{-2}
Core Recovery %
RQD %: 20 40 60 80
UCS - MPa: 50 100 150 200
Point Load
Triaxial
RMR: 20 40 60 80

(Continued on next page)

Survey Method :Handheld GPS
Co-ordinates (m) : 683,991E, 5,610,940N
Ground Elevation (m) : 986
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste MD-XL
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/Triple Tube
Core : HQ3
Fluid : Water
Casing : HWT **Cased To (m)** : 38.1

Start Date : 09 May 13
Finish Date : 11 May 13
Final Depth of Hole (m) : 48.16
Depth to Top of Rock (m) : 36.88
Logged by : SLP
Reviewed by : AKU

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
40					
41			2.5		Below 40.54 m - shears present, 2 joint sets at 50° and 65° to core axis, visible slickensides, calcite and clay infill with iron oxidation, JRC = 1-2. At 41.04 m - highly fractured zone with broken and crushed rock, and clay (green) infill.
42					From 41.66 to 41.70 m - minor fault with crushed rock, decomposed rock and clay infill, purplish-red staining on discontinuities. Below 42.06 m - light green, 2 joint sets at 15° and 45° to core axis, white clay and calcite infill, some joints on veins present, JRC = 2-12.
43		R1	2		
44			1.5		Below 43.59 m - green, 2 joint sets at 15° and 80° to core axis, slickensides present on some discontinuities, calcite, clay (white and yellow) infill as well as iron oxidation.
45					
46			1.5		Below 45.11 m - grey, 2 joint sets at 35° and 90° to core axis, with calcite and clay infill, and iron oxidation on discontinuity surfaces, JRC = 2-18, fresh and unweathered to slightly weathered (W1-W2).
47			1.5		Below 46.63 m - 3 joint sets at 25°, 50° and 90° to core axis, clay and calcite infill (approximately 1 mm aperture).
48					At 47.87 m - discontinuity with crushed rock and clay (grey) infill, footwall oriented at 65° to core axis, reddish purple surface staining on footwall, JRC = 2.
					END OF HOLE AT 48.16 m
49					Notes: 1. 2.5" PVC standpipe piezometer installed with screen from 35.36 to 38.40 m. 2. Filter sand placed from 34.54 to 39.01 m. 3. Bentonite seal placed from 32.87 to 34.54 m and hydrated with water.
50					

Instrument Details

Hydraulic Conductivity m/sec: 10^{-8} 10^{-6} 10^{-4} 10^{-2}
Core Recovery %
RQD %: 20 40 60 80

UCS - MPa: 50 100 150 200
Point Load
Triaxial
RMR: 20 40 60 80

(Continued on next page)

Survey Method :Handheld GPS
Co-ordinates (m) : 683,991E, 5,610,940N
Ground Elevation (m) : 986
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste MD-XL
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/Triple Tube
Core : HQ3
Fluid : Water
Casing : HWT **Cased To (m)** : 38.1

Start Date : 09 May 13
Finish Date : 11 May 13
Final Depth of Hole (m) : 48.16
Depth to Top of Rock (m) : 36.88
Logged by : SLP
Reviewed by : AKU

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description	Instrument Details	Hydraulic Conductivity m/sec (10^{-8} 10^{-6} 10^{-4} 10^{-2}) / Core Recovery % / RQD % (20 40 60 80)	UCS - MPa (50 100 150 200) ■ Point Load ◇ Triaxial / RMR (20 40 60 80)
50					4. Water level measured on May 13, 2013: 16.85 m below ground surface. 5. SPT hammer type: Automatic trip, 140 lbs. N values shown are uncorrected.			
51								
52								
53								
54								
55								
56								
57								
58								
59								
60								

Project: AJAX MEMA Support

DRILL HOLE # BGC13-018

Location: Plant Site

Project No. : 1125-003

Survey Method: Handheld GPS
Co-ordinates (m): 683,013E, 5,610,651N
Ground Elevation (m): 945
Datum: NAD83
Dip (degrees from horizontal): 90
Direction: n/a

Drill Designation: Fraste MD-XL
Drilling Contractor: Geotech Drilling
Drill Method: ODEX/Triple Tube
Core: HQ3
Fluid: Water
Casing: HWT **Cased To (m):** 1.52

Start Date: 13 May 13
Finish Date: 13 May 13
Final Depth of Hole (m): 11.58
Depth to Top of Rock (m): 0.22
Logged by: SLP
Reviewed by: AKU

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description
0		M1		ORGANICS Organic silt, vegetation, grasses, trace rootlets < 1 mm diameter.
				SILT (ML) Sandy, trace to some gravel, trace clay, no plasticity, light brown, no odour, dry, homogeneous, no cementation, rapid dilatancy, sand is fine, gravel is multi-lithic. [TILL] From 0.0 to 0.23 m - SPT M1; N = 8, recovery = 0.18 m.
				Rock encountered at 0.22 m depth. See BGC13-018 rock log.

Instrument Details

DCT Blows per 300mm

SPT Blows per 150mm

3
R

Su - kPa
40 80 120 160
VANE FIELD LAB
PEAK ◆ ■
REMOLD ◇ □
▲ UC/2
△ Pocket Pen /2
★ % Fines
Hydraulic Conductivity (m/sec)
10^{-8} 10^{-6} 10^{-4} 10^{-2}
DCT (blows/300mm)
● SPT (blows/300mm)
Core Recovery
20 40 60 80
Moisture Content & SPT N
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: KGHM International Ltd.

Survey Method :Handheld GPS
Co-ordinates (m) : 683,013E, 5,610,651N
Ground Elevation (m) : 945
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste MD-XL
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/Triple Tube
Core : HQ3
Fluid : Water
Casing : HWT **Cased To (m)** : 1.52

Start Date : 13 May 13
Finish Date : 13 May 13
Final Depth of Hole (m) : 11.58
Depth to Top of Rock (m) : 0.22
Logged by : SLP
Reviewed by : AKU

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					0 to 0.22 m - See BGC13-018 soil log.
0		S1			BEDROCK Green, medium grained, microfractured, medium strong (R3), slightly weathered (W2), 2 joint sets at 34° and parallel to core axis, highly fractured rock. [IRON MASK HYBRID]
2			2		
2.44					Below 2.44 m - dark grey, 3 joint sets at 25°, 50° and parallel to core axis, no infill, apart from surface staining (brownish yellow), JRC = 3-18.
3			2		
3.96					Below 3.96 m - 2 joint sets at 25° and 60° to core axis.
4.25					Below 4.25 m - shear with visible slickensides, surface staining (yellowish brown), occurring at 25° to core axis, JRC = 2.
4			2		
5					From 5.19 to 5.49 m - highly fractured zone, hard joint walls.
5.49					Below 5.49 m - green, 2 joint sets at 60° and 70° to core axis, some discontinuities on veins, no infill except surface staining.
6			2		
7					Below 7.01 m - dark grey, 2 joint sets at 45° and 60° to core axis, calcite infill along quartz veins, fresh and unweathered to slightly weathered (W1-W2).
8			1.5		
8.53					Below 8.53 m - dark green, 2 joint sets at 33° and 65° to core axis in competent rock, calcite infill, JRC = 6-20.
9			1		
10					

Instrument Details

Hydraulic Conductivity m/sec: 10^{-8} 10^{-6} 10^{-4} 10^{-2}
Core Recovery %
RQD %: 20 40 60 80

UCS - MPa: 50 100 150 200
Point Load
Triaxial
RMR: 20 40 60 80

(Continued on next page)

Survey Method :Handheld GPS
Co-ordinates (m) : 683,013E, 5,610,651N
Ground Elevation (m) : 945
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste MD-XL
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/Triple Tube
Core : HQ3
Fluid : Water
Casing : HWT **Cased To (m)** : 1.52

Start Date : 13 May 13
Finish Date : 13 May 13
Final Depth of Hole (m) : 11.58
Depth to Top of Rock (m) : 0.22
Logged by : SLP
Reviewed by : AKU

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description	Instrument Details
10			1.5		Below 10.06 m - dark green, 2 joint sets at 25° and 50° to core axis, surface staining on discontinuities, from purplish red to yellowish green, some slickensides visible.	
12					END OF HOLE AT 11.58 m Notes: 1. 2" PVC standpipe piezometer installed with screen from 7.92 to 10.97 m. 2. Filter sand placed from 7.32 to 11.58 m. 3. Bentonite seal placed from 5.79 to 7.32 m and hydrated with water. 4. Water level measured May 15, 2013: 1.92 m below ground surface. 5. SPT hammer type: Automatic trip, 140 lbs. N values shown are uncorrected.	

Hydraulic Conductivity m/sec: 10^{-8} 10^{-6} 10^{-4} 10^{-2}
Core Recovery %
RQD %: 20 40 60 80
UCS - MPa: 50 100 150 200
Point Load
Triaxial
RMR: 20 40 60 80

Survey Method: Handheld GPS
Co-ordinates (m): 682,670E, 5,610,467N
Ground Elevation (m): 930
Datum: NAD83
Dip (degrees from horizontal): 90
Direction: n/a

Drill Designation: Fraste MD-XL
Drilling Contractor: Geotech Drilling
Drill Method: ODEX/Triple Tube
Core: HQ3
Fluid: Water
Casing: HWT **Cased To (m):** 4.57

Start Date: 14 May 13
Finish Date: 14 May 13
Final Depth of Hole (m): 14.63
Depth to Top of Rock (m): 3.12
Logged by: SLP
Reviewed by: TWC

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details	DCT Blows per 300mm	SPT Blows per 150mm
0		M1		ORGANICS Organic silt, grasses, trace rootlets < 1 mm diameter.			2 3 5
1		M2		SAND and SILT (SM) Fine, some gravel, trace clay, well graded, compact, maximum particle size is 20 mm, elongated, subrounded, light brown, no odour, dry, homogeneous, no cementation. [TILL]			11 12 13
2		M3		Below 1.52 m - equant, subangular, moist. From 1.52 to 1.98 m - Particle Size Analysis: 11% gravel, 46% sand, 43% fines. Below 1.71 m - colour change to dark brown.			11 15 16
3		M4		CLAY (CH) Some silt, trace sand, trace gravel, high plasticity, very stiff, light brown, no odour, moist, slight lamination, alternating fine sand and clay layers in some zones, no cementation, high dry strength, slow dilatancy, sand is fine, gravel is fine, maximum particle size is 20 mm, flat, subangular. [LACUSTRINE] From 3.05 to 3.51 m - SPT M5; N = refusal, recovery = 0.08 m.			4 8 22
4				Rock encountered at 3.12 m depth. See BGC13-019 rock log.			
5							
6							
7							
8							
9							
10							

Su - kPa: 40, 80, 120, 160
VANE PEAK / REMOLD — FIELD ◆ ◇ — LAB ■ □
UC/2 ▲
Pocket Pen /2 △
★ % Fines
Hydraulic Conductivity (m/sec) 10^{-8} 10^{-6} 10^{-4} 10^{-2}
DCT (blows/300mm)
SPT (blows/300mm) ●
Core Recovery 20 40 60 80
Moisture Content & SPT N
W_P% W% W_L% 20 40 60 80

Survey Method :Handheld GPS
Co-ordinates (m) : 682,670E, 5,610,467N
Ground Elevation (m) : 930
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste MD-XL
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/Triple Tube
Core : HQ3
Fluid : Water
Casing : HWT **Cased To (m)** : 4.57

Start Date : 14 May 13
Finish Date : 14 May 13
Final Depth of Hole (m) : 14.63
Depth to Top of Rock (m) : 3.12
Logged by : SLP
Reviewed by : TWC

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					0 to 3.12 m - See BGC13-019 soil log.
3		M5			BEDROCK Dark green, coarse grained, stockwork, weak to medium strong (R2-R3), fresh to slightly weathered (W1-W2), few discontinuities, 1 joint set at 60° to core axis, yellow and red surface staining, calcite infill. [IRON MASK HYBRID]
5			2		
5.49			1.5		Below 5.49 m - 2 joint sets at 80° and 40° to core axis, calcite infill (< 1 mm thick), apertures from 1 to 10 mm, JRC = 2-12.
7			1		From 14.63 m to 14.63 m - fresh and unweathered (W1). Below 7.01 m - 2 joint sets at 25° and 55° to core axis, calcite infill (< 1 mm thick), JRC = 2-20.
8					From 7.87 to 7.94 m - zone of highly fractured rock, crushed rock and calcite infill.
8.53			1		Below 8.53 m - 3 joint sets at 45°, 60° and almost parallel to core axis, calcite infill (< 1 mm thick), medium strong, JRC = 2-14.
10					

Instrument Details

Hydraulic Conductivity m/sec: 10^{-8} 10^{-6} 10^{-4} 10^{-2}

Core Recovery %

RQD %: 20 40 60 80

UCS - MPa: 50 100 150 200

Point Load

Triaxial

RMR: 20 40 60 80

(Continued on next page)

Survey Method :Handheld GPS
Co-ordinates (m) : 682,670E, 5,610,467N
Ground Elevation (m) : 930
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste MD-XL
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/Triple Tube
Core : HQ3
Fluid : Water
Casing : HWT **Cased To (m)** : 4.57

Start Date : 14 May 13
Finish Date : 14 May 13
Final Depth of Hole (m) : 14.63
Depth to Top of Rock (m) : 3.12
Logged by : SLP
Reviewed by : TWC

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
10			1		Below 10.06 m - 3 joint sets at 18°, 28°, 52° to core axis, little calcite infill, JRC=2-18, medium strong.
11					
12		R2	1		Below 11.58 m - 3 joint sets at 40°, 15°, and 75° to core axis, calcite infill, JRC = 2-12.
13			1		Below 13.11 m - 2 joint sets at 22° and 80° to core axis, calcite infill (2 mm thick).
14					From 14.38 m to 14.63 m - zone of highly fractured rock, broken and crushed rock.
15					END OF HOLE AT 14.63 m
16					Notes: 1. 2" PVC standpipe piezometer installed with screen from 4.11 to 7.16 m. 2. Filter sand placed from 3.38 to 7.92 m. 3, Bentonite seal placed from 2.01 to 3.38 m and hydrated with water. 4. Water level measured on May 15, 2013: 1.86 m below ground surface. 5. SPT hammer type: Automatic trip, 140 lbs. N values shown are uncorrected.
17					
18					
19					
20					

Instrument Details

Hydraulic Conductivity m/sec
10^{-8} 10^{-6} 10^{-4} 10^{-2}

Core Recovery %

RQD %
20 40 60 80

UCS - MPa
50 100 150 200
■ Point Load
◇ Triaxial

RMR
20 40 60 80

Survey Method: Handheld GPS
Co-ordinates (m): 682,640E, 5,610,397N
Ground Elevation (m): 905
Datum: NAD83
Dip (degrees from horizontal): 90
Direction: n/a

Drill Designation: Fraste MD-XL
Drilling Contractor: Geotech Drilling
Drill Method: ODEX/Triple Tube
Core: HQ3
Fluid: Water
Casing: HWT **Cased To (m):** 4.57

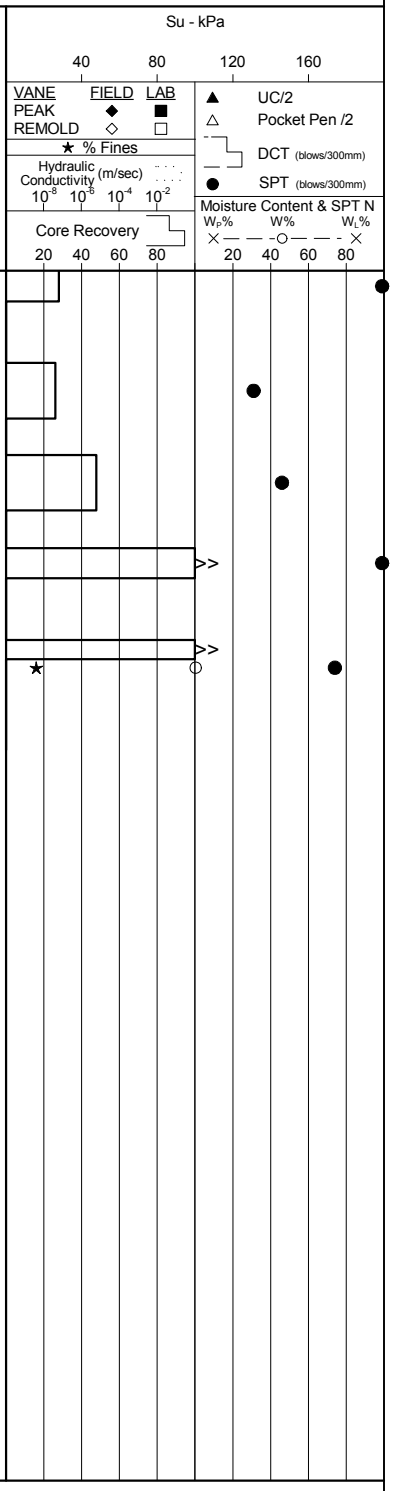
Start Date: 14 May 13
Finish Date: 15 May 13
Final Depth of Hole (m): 14.63
Depth to Top of Rock (m): 3.96
Logged by: SLP
Reviewed by: TWC

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description
0		M1		ORGANICS Organic silt, grasses, trace rootlets < 1 mm diameter. [FILL]
1		M2		GRAVEL (GW) Fine, sandy, some silt, trace clay, well graded, dense, maximum particle size is 30 mm, flat, subangular, light brown with grey clasts, no odour, dry, homogeneous, no cementation. [TILL]
2		M3		Below 1.52 m - angular.
		M4		Below 2.29 m -silty.
3		M5		From 3.05 to 3.51 m - Particle Size Analysis: 59% gravel, 25% sand, 16% fines.
4				Rock encountered at 3.96 m depth. See BGC13-020 rock log.
5				
6				
7				
8				
9				
10				

Instrument Details

DCT Blows per 300mm

SPT Blows per 150mm: 7, R, 12, 13, 18, 19, 23, 23, 17, R, 20, 36, 38



Survey Method :Handheld GPS
Co-ordinates (m) : 682,640E, 5,610,397N
Ground Elevation (m) : 905
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste MD-XL
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/Triple Tube
Core : HQ3
Fluid : Water
Casing : HWT **Cased To (m)** : 4.57

Start Date : 14 May 13
Finish Date : 15 May 13
Final Depth of Hole (m) : 14.63
Depth to Top of Rock (m) : 3.96
Logged by : SLP
Reviewed by : TWC

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
0					0 to 3.96 m - See BGC13-020 soil log.
4					BEDROCK Light grey to white, medium grained, stockwork, medium strong to strong (R2-R3), fresh and unweathered (W1). [IRON MASK HYBRID]
5			1		Below 4.57 m - one joint set at 87° to core axis, brownish yellow surface staining, aperture 2 to 5 mm.
6			1		Below 5.49 m - 2 joint sets at 55° and 15° to core axis, JRC = 12-20.
7			1		Below 7.01 m - coarse grained, 2 joint sets at 55° and 50° to core axis, JRC = 10 -20.
8			1		At 8.31 m - highly fractured zone with some clay and crushed rock infill. Below 8.53 m - dark green, 2 joint sets at 45° and 60° to core axis.
9			1		
10					

Instrument Details

Hydraulic Conductivity m/sec
10^{-8} 10^{-6} 10^{-4} 10^{-2}

Core Recovery %

RQD %
20 40 60 80

UCS - MPa
50 100 150 200
■ Point Load
◇ Triaxial

RMR
20 40 60 80

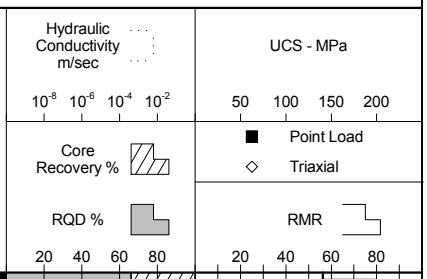
(Continued on next page)

Survey Method :Handheld GPS
Co-ordinates (m) : 682,640E, 5,610,397N
Ground Elevation (m) : 905
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste MD-XL
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/Triple Tube
Core : HQ3
Fluid : Water
Casing : HWT **Cased To (m)** : 4.57

Start Date : 14 May 13
Finish Date : 15 May 13
Final Depth of Hole (m) : 14.63
Depth to Top of Rock (m) : 3.96
Logged by : SLP
Reviewed by : TWC

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description	Instrument Details
10			1		From 10.06 to 10.69 m - zone of highly fractured rock, no discernible joint sets.	
11					Below 10.69 m - 2 joint sets at 60° and 35° to core axis.	
12			1		Below 11.58 m - one joint set at 45° to core axis, JRC = 4-18. From 11.94 to 12.52 m - brecciated, decomposed rock, hanging wall at 23° to core axis, foot wall at 45° to core axis, broken and crushed rock, clay, sand and calcite infill, hanging wall JRC = 2.	
13			1		Below 13.11 m - one joint set at 42° to core axis, clean discontinuity surfaces, JRC = 2-6.	
14						
15					END OF HOLE AT 14.63 m Notes: 1. 2" PVC standpipe piezometer installed with screen from 2.21 to 3.73 m. 2. Filter sand placed from 1.68 to 4.27 m. 3. Bentonite seal placed from 0.00 to 1.68 m and hydrated with water. 4. Water level measured on May 15, 2013: 1.01 m below ground surface. 5. SPT hammer type: Automatic trip, 140 lbs. N values shown are uncorrected.	
16						
17						
18						
19						
20						



Survey Method: Handheld GPS
Co-ordinates (m): 687,756E, 5,609,524N
Ground Elevation (m): 872
Datum: NAD83
Dip (degrees from horizontal): 90
Direction: n/a

Drill Designation: Fraste MD-XL
Drilling Contractor: Geotech Drilling
Drill Method: ODEX/Triple Tube
Core: HQ3
Fluid: Water
Casing: HWT **Cased To (m):** 0

Start Date: 05 Jun 12
Finish Date: 10 May 12
Final Depth of Hole (m): 42.67
Depth to Top of Rock (m):
Logged by: SLP
Reviewed by: TWC

Depth (m)	Sample Type	Sample No.	Lithologic Description
0		M1	SAND (SW) Coarse, silty, some gravel, well graded, loose to compact, dark brown, no odour, dry, homogeneous, no cementation, trace rootlets and grasses < 1 mm diameter, gravel is coarse, maximum particle size is 30 mm, flat, subangular. [FILL]
1			GRAVEL (GM) Fine, sandy, some silt, trace clay, gap graded, compact, maximum particle size is 20 mm, flat and elongated, subangular, grey, no odour, dry, homogeneous, no cementation, multi-lithic, sand is fine. [TILL]
2		M2	
3		M3	Below 3.05 m - rounded to subangular, light brown. From 3.05 to 3.51 m - Particle Size Analysis: 60% gravel, 23% sand, 17% fines.
4			
5		M4	SAND (SM) Fine, silty, trace gravel, well graded, very dense, maximum particle size is 10 mm, equant, subrounded, light brown, no odour, dry, homogeneous, no cementation.
6			CLAY (CI) Silty, trace sand, medium plasticity, very stiff, light to dark brown, no odour, dry to slightly moist, laminated, no cementation, slow dilatancy.
7		M5	Below 6.10 m - trace gravel, maximum particle size is 30 mm, flat, subangular. From 6.10 to 6.56 m - Hydrometer Analysis: 0% gravel, 8% sand, 92% fines.
8		M6	SAND (SM) Fine, silty, trace gravel, gap graded, dense, maximum particle size is 7 mm, flat and elongated, angular, light brown, no odour, moist, homogeneous, no cementation.
9			CLAY (CH) Silty, high plasticity, very stiff, light brown, no odour, moist, laminated, no cementation, slow dilatancy.
		M7	SAND (SM) Fine, silty, trace gravel, gap graded, dense, maximum particle size is 5 mm, flat, angular, light brown, no odour, moist, homogeneous, no cementation.
10			SAND (SM)

Instrument Details

DCT Blows per 300mm

SPT Blows per 150mm: 3, 4, 4 | 4, 4, 6 | 8, 10, 11 | 12, 25, 24 | 16, 24, 30 | 23, 20, R | 20, R

Su - kPa: 40, 80, 120, 160
VANE PEAK / REMOLD — FIELD ◆ ◇ — LAB ■ □
★ % Fines
Hydraulic Conductivity (m/sec) 10^{-8} 10^{-6} 10^{-4} 10^{-2}
Core Recovery: 20, 40, 60, 80
▲ UC/2
△ Pocket Pen /2
DCT (blows/300mm)
● SPT (blows/300mm)
Moisture Content & SPT N
W_P% W% W_L%: 20, 40, 60, 80

(Continued on next page)

Survey Method: Handheld GPS
Co-ordinates (m): 687,756E, 5,609,524N
Ground Elevation (m): 872
Datum: NAD83
Dip (degrees from horizontal): 90
Direction: n/a

Drill Designation: Fraste MD-XL
Drilling Contractor: Geotech Drilling
Drill Method: ODEX/Triple Tube
Core: HQ3
Fluid: Water
Casing: HWT **Cased To (m):** 0

Start Date: 05 Jun 12
Finish Date: 10 May 12
Final Depth of Hole (m): 42.67
Depth to Top of Rock (m):
Logged by: SLP
Reviewed by: TWC

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description
10				Fine, silty, clayey, uniform, light brown, no odour, moist, homogeneous with some laminations, no cementation, rapid dilatancy.
11		M8		SAND and GRAVEL (SP-GP) Sand is medium, gravel is fine, trace silt, gap graded, very dense, maximum particle size is 40 mm, flat and elongated, subangular, light brown matrix with grey and orange clasts, no odour, moist, homogeneous, no cementation, pockets of oxidized sand throughout. [FLUVIAL]
12		M9		SAND (SP) Coarse, trace gravel, no fines, uniform, maximum particle size is 1 mm, flat and elongated, angular, light and dark brown, no odour, moist to wet, homogeneous, no cementation. At 11.58 m - boulder.
13				SAND (SW) Medium to coarse, gravelly, some silt, trace clay, well graded, maximum particle size is 30 mm, flat, subangular, light brown with grey clasts, no odour, moist, homogeneous, no cementation, gravel is coarse.
14		M10		Below 13.72 m - sand is fine to medium, angular, dark grey.
15				
16		M11		CLAY (CI) Silty, sandy, some gravel, medium plasticity, very stiff, dark grey, no odour, moist, homogeneous, no cementation, slow dilatancy, sand pockets throughout (1 mm thick), sand is fine, gravel is coarse, maximum particle size is 30 mm, flat, subrounded. [TILL] From 15.24 to 15.70 m - Hydrometer Analysis: 12% gravel, 22% sand, 66% fines.
17		M12		Below 16.76 m - trace to some sand, gravel is equant, rounded.
18				
19		M13		Below 18.29 m - some gravel, flat, subrounded to subangular.
20				At 19.81 m - increasing moisture content with depth.

Instrument Details

DCT Blows per 300mm

SPT Blows per 150mm: 14, 28, R; R; 26, 49, R; 7, 20, 20; 9, 11, 17; 49, R; 24

Su - kPa: 40, 80, 120, 160
VANE PEAK / REMOLD — FIELD ◆ ◇ — LAB ■ □
UC/2 ▲
Pocket Pen /2 △
DCT (blows/300mm)
SPT (blows/300mm) ●
★ % Fines
Hydraulic Conductivity (m/sec): 10^{-8} 10^{-6} 10^{-4} 10^{-2}
Core Recovery: 20, 40, 60, 80
Moisture Content & SPT N: W_P% W% W_L%: 20, 40, 60, 80

(Continued on next page)

Survey Method: Handheld GPS
Co-ordinates (m): 687,756E, 5,609,524N
Ground Elevation (m): 872
Datum: NAD83
Dip (degrees from horizontal): 90
Direction: n/a

Drill Designation: Fraste MD-XL
Drilling Contractor: Geotech Drilling
Drill Method: ODEX/Triple Tube
Core: HQ3
Fluid: Water
Casing: HWT **Cased To (m):** 0

Start Date: 05 Jun 12
Finish Date: 10 May 12
Final Depth of Hole (m): 42.67
Depth to Top of Rock (m):
Logged by: SLP
Reviewed by: TWC

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details	DCT Blows per 300mm	SPT Blows per 150mm
20		M14					R
21							
		M15		SAND (SP) Medium to coarse, uniform, loose, dark brownish grey, no odour, wet, homogeneous, no cementation, comparable to beach sand. Sands within this unit are flowing into the casing.			0 2 3
22							
		M16					3 2 3
23							
24							
25							
26		M17		SAND and SILT (SM) Fine, trace clay, trace gravel, uniform, very dense, medium to light brown, no odour, wet, homogeneous with some laminations, no cementation, comparable to beach sand. Sands are flowing into the casing. From 25.91 to 26.37 m - Particle Size Analysis: 0% gravel, 38% sand, 62% fines.			16 32 R
27							
		M18		SAND and GRAVEL (SP-GP) Sand is coarse, gravel is coarse, trace silt, poorly graded, very dense, maximum particle size is 30 mm, elongated to equant, rounded, brown to grey, orange and black clasts, no odour, wet, homogeneous, no cementation, multi-lithic. Below 27.43 m - Sands are flowing into the casing.			17 50 R
28							
29							
30							

Su - kPa: 40, 80, 120, 160
VANE PEAK / REMOLD — FIELD ◆ ◇ — LAB ■ □
▲ UC/2
△ Pocket Pen /2
★ % Fines
DCT (blows/300mm)
● SPT (blows/300mm)
Hydraulic Conductivity (m/sec) 10^{-8} 10^{-6} 10^{-4} 10^{-2}
Core Recovery: 20, 40, 60, 80
Moisture Content & SPT N — W_P% W% W_L%: 20, 40, 60, 80

(Continued on next page)

Survey Method: Handheld GPS
Co-ordinates (m): 687,756E, 5,609,524N
Ground Elevation (m): 872
Datum: NAD83
Dip (degrees from horizontal): 90
Direction: n/a

Drill Designation: Fraste MD-XL
Drilling Contractor: Geotech Drilling
Drill Method: ODEX/Triple Tube
Core: HQ3
Fluid: Water
Casing: HWT **Cased To (m):** 0

Start Date: 05 Jun 12
Finish Date: 10 May 12
Final Depth of Hole (m): 42.67
Depth to Top of Rock (m):
Logged by: SLP
Reviewed by: TWC

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details	DCT Blows per 300mm	SPT Blows per 150mm
30				Below 32.00 m - gravel is subrounded to subangular. Water is returning clean and clear, at a rate of approximately 45 litres/min during drilling activities.			
31							
32							
33							
34							
35							
36							
37				From 36.58 to 38.71 m - samples were retrieved by HQ coring. GRAVEL and COBBLES (GW) Fine to coarse, well graded, particle size range from 5 to 60 mm (maximum measurable size is core diameter), equant, rounded to subangular, grey to brown, no odour, wet, homogeneous, no cementation, multi-lithic. [FLUVIAL]			
38							
39				Below 39.01 m - sandy, coarse, groundwater return is green in colour.			
40							

Su - kPa
40 80 120 160
VANE FIELD LAB
PEAK ◆ ■
REMOLD ◇ □
▲ UC/2
△ Pocket Pen /2
★ % Fines
DCT (blows/300mm)
Hydraulic Conductivity (m/sec)
10^{-8} 10^{-6} 10^{-4} 10^{-2}
● SPT (blows/300mm)
Core Recovery
20 40 60 80
Moisture Content & SPT N
W_P% W% W_L%
20 40 60 80

(Continued on next page)

Survey Method: Handheld GPS
Co-ordinates (m): 687,756E, 5,609,524N
Ground Elevation (m): 872
Datum: NAD83
Dip (degrees from horizontal): 90
Direction: n/a

Drill Designation: Fraste MD-XL
Drilling Contractor: Geotech Drilling
Drill Method: ODEX/Triple Tube
Core: HQ3
Fluid: Water
Casing: HWT **Cased To (m):** 0

Start Date: 05 Jun 12
Finish Date: 10 May 12
Final Depth of Hole (m): 42.67
Depth to Top of Rock (m):
Logged by: SLP
Reviewed by: TWC

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details	DCT Blows per 300mm	SPT Blows per 150mm
40							
41							
42							
43				END OF HOLE AT 42.67 m 1. 2" PVC standpipe piezometer installed with screen from 9.17 to 12.22 m. 2. Filter sand placed from 8.53 to 13.31 m. 3. Bentonite seal placed from 7.01 to 8.53 m and hydrated with water. 4. Water level measured on June 13, 2013: 11.06 m below ground surface. 5. Hole terminated before intersecting rock due to difficulty advancing through flowing sands. 6. SPT hammer type: Automated trip, 140 lbs. N values shown are uncorrected.			
44							
45							
46							
47							
48							
49							
50							

Su - kPa
40 80 120 160
VANE FIELD LAB
PEAK ◆ ■
REMOLD ◇ □
▲ UC/2
△ Pocket Pen /2
★ % Fines
Hydraulic Conductivity (m/sec)
10^{-8} 10^{-6} 10^{-4} 10^{-2}
DCT (blows/300mm)
SPT (blows/300mm)
Core Recovery
20 40 60 80
Moisture Content & SPT N
W_P% W% W_L%
20 40 60 80

Survey Method: Handheld GPS
Co-ordinates (m): 687,168E, 5,609,516N
Ground Elevation (m): 895
Datum: NAD83
Dip (degrees from horizontal): 90
Direction: n/a

Drill Designation: Fraste MD-XL
Drilling Contractor: Geotech Drilling
Drill Method: ODEX/Triple Tube
Core: HQ3
Fluid: Water
Casing: HWT **Cased To (m):** 44.2

Start Date: 11 Jun 13
Finish Date: 13 Jun 13
Final Depth of Hole (m): 54.25
Depth to Top of Rock (m): 41.76
Logged by: SLP
Reviewed by: TWC

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description
0		M1		SILT (ML) Sandy, some gravel, no plasticity, stiff, dark brown, no odour, dry, homogeneous, no cementation, rapid dilatancy, sand is fine, gravel is fine, maximum particle size is 15 mm, flat, subangular, trace rootlets and twigs < 1 mm to 3 mm diameter, grasses. [FILL]
2		M2		SAND (SM) Fine, silty, some gravel, trace clay, well graded, compact, maximum particle size is 20 mm , flat and elongated, subrounded to angular, light brown, no odour, homogeneous, no cementation, multi-lithic. [TILL]
3		M3		SILT (MH) Some clay, some sand, trace gravel, high plasticity, very stiff, light brown, no odour, homogeneous, no cementation, slow to rapid dilatancy, sand is fine, gravel is fine, maximum particle size is 10 mm, equant, subrounded. [TILL]
4				CLAY (CI) Silty, some sand, some gravel, medium plasticity, very stiff, light brown, no odour, wet, homogeneous with some laminations, no cementation, slow dilatancy, sand is fine, gravel is coarse, maximum particle size is 25 mm, equant, subrounded. [TILL]
5		M4		
6		M5		Below 6.10 m - light brownish grey. From 6.10 to 6.56 m - Hydrometer Analysis: 11% gravel, 16% sand, 73% fines.
8		M6		SAND (SP) Fine, some silt, trace gravel, gap graded, compact, maximum particle size is 15 mm, elongated, rounded, dark grey, no odour, wet, homogeneous, no cementation.
9		M7		CLAY and GRAVEL (CL/GC) Silty, sandy, low plasticity, hard, greyish brown, no odour, wet, homogeneous, no cementation, slow dilatancy, gravel is coarse, maximum particle size is 30 mm, flat and elongated, rounded, sand is
10				

Instrument Details

DCT Blows per 300mm

SPT Blows per 150mm: 2, 3, 7 | 8, 15, 14 | 7, 12, 14 | 5, 8, 14 | 6, 10, 13 | 5, 10, 18 | 9, 13, 20

Su - kPa: 40, 80, 120, 160
VANE PEAK / REMOLD — FIELD ◆ ◇ — LAB ■ □
UC/2 ▲
Pocket Pen /2 △
DCT (blows/300mm)
SPT (blows/300mm) ●
★ % Fines
Hydraulic Conductivity (m/sec): 10^{-8} 10^{-6} 10^{-4} 10^{-2}
Core Recovery: 20, 40, 60, 80
Moisture Content & SPT N: W_P% W% W_L%: 20, 40, 60, 80

(Continued on next page)

Survey Method: Handheld GPS
Co-ordinates (m): 687,168E, 5,609,516N
Ground Elevation (m): 895
Datum: NAD83
Dip (degrees from horizontal): 90
Direction: n/a

Drill Designation: Fraste MD-XL
Drilling Contractor: Geotech Drilling
Drill Method: ODEX/Triple Tube
Core: HQ3
Fluid: Water
Casing: HWT **Cased To (m):** 44.2

Start Date: 11 Jun 13
Finish Date: 13 Jun 13
Final Depth of Hole (m): 54.25
Depth to Top of Rock (m): 41.76
Logged by: SLP
Reviewed by: TWC

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details	DCT Blows per 300mm	SPT Blows per 150mm
10				fine. [TILL]			
11		M8		Below 10.66 m - gravelly, equant, subangular.			17 27 31
12		M9		Below 12.19 m - dark grey, angular to subangular clasts.			10 17 20
13							
14		M10		Below 13.72 m - flat and elongated, rounded to angular.	▼		10 30 43
15				At 14.95 m - water table observed while drilling.			
		M11		From 15.24 to 15.70 m - Hydrometer Analysis: 31% gravel, 26% sand, 43% fines.			13 26 33
16							
17		M12					25 37 R
18		M13					24 R
19							
20				SAND and GRAVEL (SW-GW)			26

Su - kPa: 40, 80, 120, 160
VANE PEAK / FIELD ◆ / LAB ■ / REMOLD ◇ □
▲ UC/2
△ Pocket Pen /2
★ % Fines
Hydraulic Conductivity (m/sec) 10^{-8} 10^{-6} 10^{-4} 10^{-2}
DCT (blows/300mm)
● SPT (blows/300mm)
Core Recovery 20 40 60 80
Moisture Content & SPT N: W_P% W% W_L% 20 40 60 80

(Continued on next page)

Survey Method: Handheld GPS
Co-ordinates (m): 687,168E, 5,609,516N
Ground Elevation (m): 895
Datum: NAD83
Dip (degrees from horizontal): 90
Direction: n/a

Drill Designation: Fraste MD-XL
Drilling Contractor: Geotech Drilling
Drill Method: ODEX/Triple Tube
Core: HQ3
Fluid: Water
Casing: HWT **Cased To (m):** 44.2

Start Date: 11 Jun 13
Finish Date: 13 Jun 13
Final Depth of Hole (m): 54.25
Depth to Top of Rock (m): 41.76
Logged by: SLP
Reviewed by: TWC

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details	DCT Blows per 300mm	SPT Blows per 150mm
20		M14		Sand is medium, gravel is fine, silty, trace clay, well graded, very dense, maximum particle size is 20 mm, equant, rounded, dark grey, no odour, wet, homogeneous, no cementation, multi-lithic. [TILL]			62 R
21		M15		SAND (SM) Fine, silty, trace gravel, trace clay, uniform, very dense, maximum particle size is 20 mm, flat, subangular, dark grey, no odour, wet, laminated, no cementation.			35 R
22							
23		M16		SILT (ML) Sandy, some clay, no gravel, low plasticity, hard, dark grey, no odour, wet, homogeneous, no cementation, rapid dilatancy, sand is fine.			30 39 R
24							
25		M17					29 R
26							
27							
28		M18					25 44 R
29							
30							

Su - kPa: 40, 80, 120, 160
VANE PEAK / REMOLD — FIELD ◆ ◇ — LAB ■ □
UC/2 ▲ — Pocket Pen /2 △
★ % Fines
Hydraulic Conductivity (m/sec) 10^{-8} 10^{-6} 10^{-4} 10^{-2}
DCT (blows/300mm)
SPT (blows/300mm) ●
Core Recovery 20 40 60 80
Moisture Content & SPT N
W_P% W% W_L% 20 40 60 80

(Continued on next page)

Survey Method: Handheld GPS
Co-ordinates (m): 687,168E, 5,609,516N
Ground Elevation (m): 895
Datum: NAD83
Dip (degrees from horizontal): 90
Direction: n/a

Drill Designation: Fraste MD-XL
Drilling Contractor: Geotech Drilling
Drill Method: ODEX/Triple Tube
Core: HQ3
Fluid: Water
Casing: HWT **Cased To (m):** 44.2

Start Date: 11 Jun 13
Finish Date: 13 Jun 13
Final Depth of Hole (m): 54.25
Depth to Top of Rock (m): 41.76
Logged by: SLP
Reviewed by: TWC

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details	DCT Blows per 300mm	SPT Blows per 150mm
30							
31		M19					16 36 43
32							
33							
34		M20					24 33 R
35							
36							
37		M21					14 29 38
38							
39							
40		M22					4 8

Su - kPa
40 80 120 160
VANE FIELD LAB
PEAK ◆ ■
REMOLD ◇ □
▲ UC/2
△ Pocket Pen /2
★ % Fines
Hydraulic Conductivity (m/sec)
10^{-8} 10^{-6} 10^{-4} 10^{-2}
DCT (blows/300mm)
SPT (blows/300mm)
Core Recovery
20 40 60 80
Moisture Content & SPT N
W_P% W% W_L%
20 40 60 80

(Continued on next page)

Survey Method: Handheld GPS
Co-ordinates (m): 687,168E, 5,609,516N
Ground Elevation (m): 895
Datum: NAD83
Dip (degrees from horizontal): 90
Direction: n/a

Drill Designation: Fraste MD-XL
Drilling Contractor: Geotech Drilling
Drill Method: ODEX/Triple Tube
Core: HQ3
Fluid: Water
Casing: HWT **Cased To (m):** 44.2

Start Date: 11 Jun 13
Finish Date: 13 Jun 13
Final Depth of Hole (m): 54.25
Depth to Top of Rock (m): 41.76
Logged by: SLP
Reviewed by: TWC

Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details	DCT Blows per 300mm	SPT Blows per 150mm
40							14
41							
42				Rock encountered at 41.76 m depth. See BGC13-022 rock log.			
43							
44							
45							
46							
47							
48							
49							
50							

Su - kPa
40 80 120 160
VANE FIELD LAB
PEAK ◆ ■
REMOLD ◇ □
▲ UC/2
△ Pocket Pen /2
★ % Fines
Hydraulic Conductivity (m/sec)
10^{-8} 10^{-6} 10^{-4} 10^{-2}
DCT (blows/300mm)
● SPT (blows/300mm)
Core Recovery
20 40 60 80
Moisture Content & SPT N
W_P% W% W_L%
20 40 60 80

Survey Method :Handheld GPS
Co-ordinates (m) : 687,168E, 5,609,516N
Ground Elevation (m) : 895
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste MD-XL
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/Triple Tube
Core : HQ3
Fluid : Water
Casing : HWT **Cased To (m)** : 44.2

Start Date : 11 Jun 13
Finish Date : 13 Jun 13
Final Depth of Hole (m) : 54.25
Depth to Top of Rock (m) : 41.76
Logged by : SLP
Reviewed by : TWC

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description
40					0 to 41.76 m - See BGC13-022 soil log.
42					BEDROCK Light brownish green, medium grained, microfractured, medium strong (R3), slightly weathered (W2), average joint condition is 12. [IRON MASK HYBRID]
44			2		From 44.20 to 44.28 m - highly fractured rock. At 44.44 m - broken rock for 250 mm.
45			2		At 45.70 m - highly fractured and crushed rock for 260 mm.
46			2		From 45.70 to 48.36 m - zone of highly fractured rock, redrilled rocks, no fines, recovery is wet, water return is clean.
47			2		Below 46.63 m - light grey.
48			2		
49					Below 49.68 m - highly fractured rock zone for 850 mm, grey.
50					

Instrument Details

Hydraulic Conductivity m/sec: 10^{-8} 10^{-6} 10^{-4} 10^{-2}

Core Recovery %

RQD %: 20 40 60 80

UCS - MPa: 50 100 150 200

Point Load

Triaxial

RMR: 20 40 60 80

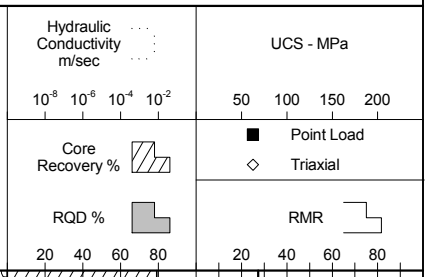
(Continued on next page)

Survey Method :Handheld GPS
Co-ordinates (m) : 687,168E, 5,609,516N
Ground Elevation (m) : 895
Datum : NAD83
Dip (degrees from horizontal) : 90
Direction : n/a

Drill Designation : Fraste MD-XL
Drilling Contractor : Geotech Drilling
Drill Method : ODEX/Triple Tube
Core : HQ3
Fluid : Water
Casing : HWT **Cased To (m)** : 44.2

Start Date : 11 Jun 13
Finish Date : 13 Jun 13
Final Depth of Hole (m) : 54.25
Depth to Top of Rock (m) : 41.76
Logged by : SLP
Reviewed by : TWC

Depth (m)	Sample Type	Sample No.	Weathering Grade	Symbol	Lithologic Description	Instrument Details
50			2		At 50.65 m - broken and crushed rock, with calcite infill for 1250 mm.	
51			2		Below 51.21 m - dark grey, weak to medium strong (R2-R3).	
52					At 52.60 m - minor fault with 130 mm of fault gouge, crushed rock, and clay infill, orientated at 88° to core axis.	
53			2		At 52.73 m - highly fractured rock for 650 mm.	
54					At 53.49 m - highly fractured rock with chlorite infill, 100 mm long, weak (R2).	
					At 53.97 m - highly fractured rock until end of hole.	
					END OF HOLE AT 54.25 m	
55					1. 2" PVC standpipe piezometer installed with screen from 13.72 to 16.76 m.	
56					2. Filter sand placed from 13.11 to 17.68 m.	
57					3. Bentonite seal placed form 11.58 to 13.11 m and hydrated with water.	
58					4. Water level measured on June 13, 2013: 13.95 m below ground surface.	
59					5. SPT hammer type: Automated trip, 140 lbs. N values shown are uncorrected.	
60						



LEGEND FOR WELL LOGS

The various parameters depicted on the well logs are described below according to the select headings found on the form.

Location

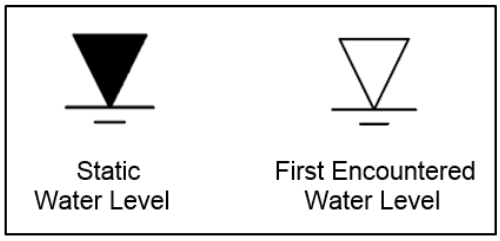
TSF – Tailings Storage Facility
EMRSF – East Mine Rock Storage Facility
SMRSF – South Mine Rock Storage Facility

Depth

Depth below ground surface is measured in metres.

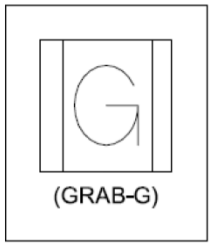
Water Levels

Groundwater levels are represented by the symbols shown below. First encountered water levels were obtained during drilling progress, static water levels were measured after drilling and piezometer installation is complete.



Sample Type and Sample Number

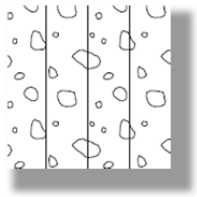
Samples were collected to permit cross-checking of logged geology by the KGHM Ajax site geologist and were limited to grab samples collected from the Dual Rotary drill cuttings. Samples are numbered and represented graphically by the symbol shown below. All samples collected from test holes are shown on the logs; however, will not be tested, as they are considered to be “disturbed” due to aggressive drilling methods.



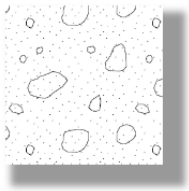
Symbol

Sediment types and rock are represented graphically by the following symbols:

GRAVEL



Silt/Gravel (GM)

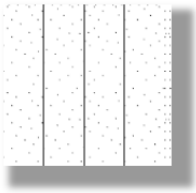


Sand/Gravel (GSP)

Poorly-graded Gravel (GP)

Well-graded Gravel (GW)

SAND

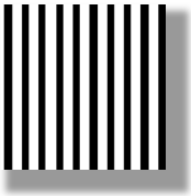


Silt/Sand (SM)

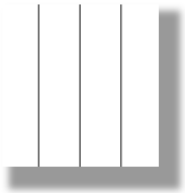
Poorly-graded Sand (SP)

Well-graded Sand (SW)

SILT

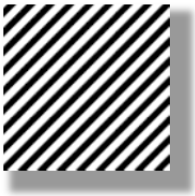


High Plastic Silt (MH)

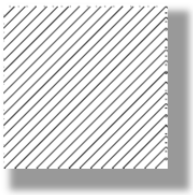


Low Plastic Silt (ML)

CLAY



High Plastic Clay (CH)

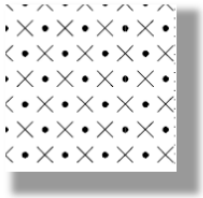


Low Plastic Clay (CI/CL)

OTHER

Boulders and Cobbles (BLDRCBBL)

BEDROCK



Ironmask Hybrid

Nicola Group

Undifferentiated Bedrock

Lithologic Description

Due to the aggressive nature of Dual Rotary drilling, sediments and lithology are considered to be of disturbed nature, and are described using simplified observations, where possible.
Disturbed sediments are classified according to the Unified Soil Classification System (USCS), and are described typically by the following features: primary constituent; particle size range; secondary constituents; gradation; colour; particle shape and angularity; maximum particle size; moisture content; presence of foreign materials.
Disturbed bedrock cuttings are described according to the International Society for Rock Mechanics (ISRM 1978). The following descriptions are typically listed for each main lithological unit on the logs: grain size; colour; alteration and weathering; vein and faulting characteristics.

Weathering Grade

Weathering and alteration of the rock mass is described according to Bieniawski 1976 parameters defined below.

Alteration and Weathering Rating (Bieniawski 1976)

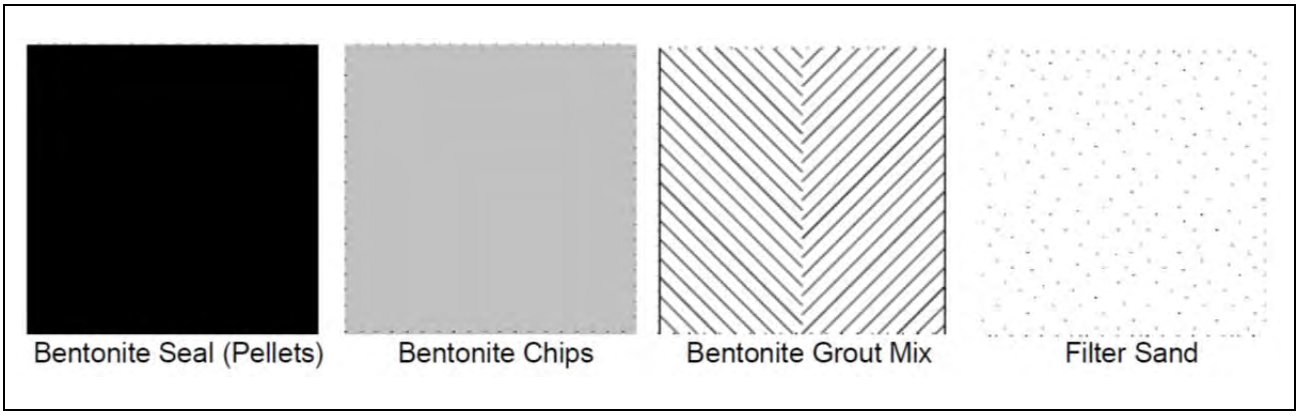
Degree of Alteration/Weathering	Description	Rating
Fresh	Alteration may result in an improvement in rock competency (e.g. silicification)	W1
Slightly Weathered/Altered	Rock strength unchanged; weathering on joints only	W2
Moderately Weathered/Altered	Rock is discoloured but rock strength only slightly affected; discontinuities are weathered	W3
Highly Weathered/Altered	Rock is discoloured and strength is significantly reduced by weathering	W4
Completely Weathered/Altered	Original fabric and relict structures remain but rock is decomposed and friable	W5
Residual Soil	Original fabric destroyed	W6

Note: If alteration/weathering is > W4 or UCS grade ≤R0, then RQD is 0% for that section. Also, if the UCS grade ≤R0, the number of discontinuities is recorded as the default 99.

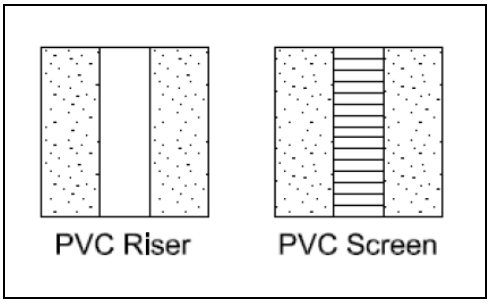
Instrument Details

Fill materials placed in the test holes are graphically represented by the symbols below. All test holes contain standpipe piezometers. These instruments are shown below in a default filter sand fill.

MATERIALS PLACED DOWN HOLE



INSTRUMENTATION SHOWN IN FILTER SAND



Project No.: 1125-007

Project: Ajax Project Environmental Assessment

DRILL HOLE # BGC14-001D

Location: Ajax Project Site

Coordinates (m): 682286E - 5608796N
Ground Elevation (m): 936
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.83

Location: TSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 3.04

Start Date: 11 Feb 2014
Finish Date: 13 Feb 2014
Final Depth (m): 29.56
Depth to Top of Rock (m): 5.18
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
935	0				SAND AND GRAVEL (GM) Silty, sand is fine, well graded, light greyish brown, trace rootlets and organics. [TOPSOIL]	0	At grade, dry	11/02/2014 12:25	Logged from sump.
934	1				SAND (SM) Fine, some silt, uniformly graded, light brown.		Dry	11/02/2014 12:30	
933	2								
932	3				SILT (ML) Some sand, some clay, trace gravel, well graded, dark brown with grey clasts. [TILL]		Dry	11/02/2014 12:30	
931	4								
930	5				GRAVEL AND SAND (GM) Some silt, sand is medium, gravel is fine, well graded, dark brown with grey clasts. [FLUVIAL]		Dry	11/02/2014 12:40	Nearing bedrock?
929	6				BEDROCK Drill cuttings: fine to medium grained, angular to subrounded, dark to light grey, unweathered to slightly weathered. [NICOLA VOLCANICS]		Dry	11/02/2014 12:42	
928	7								
927	8								
926	9								
	10								

(Continued on next page)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: KGHM Ajax Mining Inc.

Print Date: 5/28/2015

AJAX (HYDROGEO) AJAX_SOIL_HYDROGEO.GDL BGC.GDT 5/28/15

DRILL HOLE # BGC14-001D

Coordinates (m): 682286E - 5608796N
Ground Elevation (m): 936
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.83

Location: TSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 3.04

Start Date: 11 Feb 2014
Finish Date: 13 Feb 2014
Final Depth (m): 29.56
Depth to Top of Rock (m): 5.18
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
925	10				Below 10.67 m - fine, light grey.		Dry	11/02/2014 12:53	
924	11								
923	12								At 11.71 m - static water level, measured 3/12/2014 9:55.
922	13								
921	14								
920	15					14.63			
919	16								
918	17					17.07	Dry	11/02/2014 13:15	Drill returns are very dry, dusty.
917	18					17.98			
916	19						Wet, light grey	11/02/2014 13:34	At 19.20 m -water encountered. AIRLIFT #1 2.6 US GPM 3.2 US GPM
	20								

(Continued on next page)

DRILL HOLE # BGC14-001D

Coordinates (m): 682286E - 5608796N
Ground Elevation (m): 936
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.83

Location: TSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 3.04

Start Date: 11 Feb 2014
Finish Date: 13 Feb 2014
Final Depth (m): 29.56
Depth to Top of Rock (m): 5.18
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
915	20								3.4 US GPM Average 3.1 US GPM
914	21								
913	22								
912	23				Below 22.86 m - fine, smaller clast size than above, dark green.		Wet, green	11/02/2014 13:42	Possible chloritization.
911	24					24.08 24.69			
910	25								
909	26				At 25.90 m - colour change to brownish red.		Wet	11/02/2014 13:50	
908	27				At 26.52 m - colour change to grey.		Wet	11/02/2014 13:53	
907	28								
906	29						Wet	11/02/2014 14:00	AIRLIFT #2 3.4 US GPM 2.9 US GPM 2.6 US GPM Average 3.0 US GPM
	30				END OF HOLE AT 29.56 m				

(Continued on next page)

Project No.: 1125-007

Project: Ajax Project Environmental Assessment

DRILL HOLE # BGC14-001D

Location: Ajax Project Site

Coordinates (m): 682286E - 5608796N
Ground Elevation (m): 936
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.83

Location: TSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 3.04

Start Date: 11 Feb 2014
Finish Date: 13 Feb 2014
Final Depth (m): 29.56
Depth to Top of Rock (m): 5.18
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
905	31				NOTES: 1. 2" PVC standpipe piezometer installed with screen from 17.98 to 24.08 metres. 2. Filter sand placed from 17.07 to 24.69 metres. 3. Bentonite seal placed from 14.63 to 17.07 metres. 4. Hole backfilled from 24.69 m to 29.56 m with bentonite chips.				
904	32								
903	33								
902	34								
901	35								
900	36								
899	37								
898	38								
897	39								
896	40								

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: KGHM Ajax Mining Inc.

Print Date: 5/28/2015

AJAX (HYDROGEO) AJAX_SOIL_HYDROGEO.GDL BGC.GDT 5/28/15

DRILL HOLE # BGC14-001S

Project No.: 1125-007
Project: Ajax Project Environmental Assessment

Location: Ajax Project Site

Coordinates (m): 682286E - 5608796N
Ground Elevation (m): 934
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.84

Location: TSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 1.52

Start Date: 12 Feb 2014
Finish Date: 12 Feb 2014
Final Depth (m): 6.40
Depth to Top of Rock (m): 5.49
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
934	0				SAND AND GRAVEL (GM) Silty, well graded, light greyish brown. [TOPSOIL]	0	Dry	12/02/2014 10:30	
933	1				SAND (SM) Fine, trace silt, uniformly graded, light brown, no odour. [TILL]		Dry	12/02/2014 10:33	
932	2					1.83			
931	3				SILT (ML) Some sand, some gravel, trace clay, gap graded, dark brown, no odour. [TILL]		Dry	12/02/2014 10:35	
930	4					3.66 3.96			
929	5				SAND AND GRAVEL (GM) Some silt, well graded, light brown with grey clasts. [FLUVIAL]		Dry	12/02/2014 10:40	
		G	G1		BEDROCK Drill cuttings: fine to medium grained, angular to subrounded, light grey to light brown. [NICOLA VOLCANICS]	5.49	Dry	12/02/2014 10:43	
928	6								
927	7				END OF HOLE AT 6.40 m NOTES: 1. 2" PVC standpipe piezometer installed with screen from 3.96 to 5.49 metres. 2. Filter sand placed from 3.66 to 6.40 metres. 3. Bentonite seal placed from 1.83 to 3.66 metres.		Dry	12/02/2014 10:45	
926	8								
925	9								
	10								

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: KGHM Ajax Mining Inc.
Print Date: 5/28/2015

AJAX (HYDROGEO) AJAX_SOIL_HYDROGEO.GDL BGC.GDT 5/28/15

DRILL HOLE # BGC14-002D

Coordinates (m): 682756E - 5608900N
Ground Elevation (m): 925
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.73

Location: TSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 4.57

Start Date: 12 Feb 2014
Finish Date: 13 Feb 2014
Final Depth (m): 29.87
Depth to Top of Rock (m): 15.24
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
925	0				SAND (SW) Fine to medium, some gravel, trace silt, well graded, dark brown with grey clasts. [FILL]	0	Dry	12/02/2014 13:00	Logged from road cut.
924	1				SAND AND GRAVEL (GW) Silty, sand is fine to medium, gravel is fine to coarse, well graded, light brown with grey clasts, gravel size range from 3 mm to 20 mm. [FLUVIAL]		Dry	12/02/2014 13:06	
923	2	G	G1				Dry	12/02/2014 13:12	
922	3	G	G2		SILT (ML) Gravelly, some fine sand, gravel is multilithic, well graded, angular to subrounded, grey, light greyish brown matrix. [TILL]		Dry	12/02/2014 13:18	
921	4								
920	5	G	G3		GRAVEL (GM) Silty, some fine sand, trace clay, gravel is multilithic, angular to subrounded, grey to purple, gravel size range from 2 mm to 15 mm. [FLUVIAL]		Dry	12/02/2014 13:25	Welding time 13:30 to 13:42.
919	6								
918	7				SILT (ML) Some sand, some gravel, trace clay, uniformly graded, low plasticity, light brown with grey clasts. [TILL]		Moist	12/02/2014 13:47	
917	8						Moist	12/02/2014 13:50	
916	9								At 8.53 m - static water level, measured 2/13/2014 8:55.
	10				Below 9.14 m - increase in clay content to some, colour change to dark grey.		Moist	12/02/2014 13:54	Slight increase in moisture.

(Continued on next page)

DRILL HOLE # BGC14-002D

Coordinates (m): 682756E - 5608900N
Ground Elevation (m): 925
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.73

Location: TSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 4.57

Start Date: 12 Feb 2014
Finish Date: 13 Feb 2014
Final Depth (m): 29.87
Depth to Top of Rock (m): 15.24
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
915	10						Moist	12/02/2014 13:57	
914	11						Moist	12/02/2014 14:00	Welding time 14:00 to 14:11.
913	12	G	G4		Below 12.19 m - decrease in gravel content, dark greyish brown.		Moist	12/02/2014 14:15	
912	13								
911	14	G	G5			14.02	Moist	12/02/2014 14:17	
910	15								
909	16	G	G6		BEDROCK Drill cuttings: fine to coarse grained, light reddish brown to organish brown, slightly to moderately weathered, some oxidation. [NICOLA VOLCANICS]	15.85	Dry	12/02/2014 14:22	
908	17				Below 16.76 m - fine, dark grey.	16.76		12/02/2014 14:40	At 16.76 m - potential groundwater.
907	18								
906	19				Below 18.29 m - colour change to dark bluish grey.			12/02/2014 14:47	
	20								

(Continued on next page)

DRILL HOLE # BGC14-002D

Coordinates (m): 682756E - 5608900N
Ground Elevation (m): 925
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.73

Location: TSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 4.57

Start Date: 12 Feb 2014
Finish Date: 13 Feb 2014
Final Depth (m): 29.87
Depth to Top of Rock (m): 15.24
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
905	20				At 20.12 m - significant colour change to light yellowish brown.			12/02/2014 14:50	Slightly softer drilling.
					At 20.42 m - colour change to dark grey.				
							Moist	12/02/2014 14:53	
904	21								
903	22								
					At 22.56 m - colour change to dark brown.			12/02/2014 14:55	
902	23				At 22.86 m - colour change to dark bluish grey.	22.86		12/02/2014 14:57	
						23.77			
901	24	G	G7						
900	25								
899	26	G	G8						
					At 26.21 m - colour change to orangish brown.		Dry	12/02/2014 15:07	Possible oxidation.
					At 26.52 m - colour change to grey.		Dry	12/02/2014 15:09	
898	27								
		G	G9				Moist		
897	28								
896	29	G	G10				Wet	12/02/2014 15:15	AIRLIFT #1 0.6 US GPM 0.5 US GPM 0.5 US GPM Average 0.5 US GPM
	30								

(Continued on next page)

Project No.: 1125-007

Project: Ajax Project Environmental Assessment

DRILL HOLE # BGC14-002D

Location: Ajax Project Site

Coordinates (m): 682756E - 5608900N
Ground Elevation (m): 925
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.73

Location: TSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 4.57

Start Date: 12 Feb 2014
Finish Date: 13 Feb 2014
Final Depth (m): 29.87
Depth to Top of Rock (m): 15.24
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
895	30				END OF HOLE AT 29.87 m NOTES: 1. 2" PVC standpipe piezometer installed with screen from 16.76 to 22.86 metres. 2. Filter sand placed from 15.85 to 23.77 metres. 3. Bentonite seal placed from 14.02 to 15.85 metres. 4. Hole backfilled from 23.77 m to 29.87 m with bentonite chips.			12/02/2014 16:30	AIRLIFT #2 0.8 US GPM 0.9 US GPM 0.8 US GPM Average 0.8 US GPM
894	31								
893	32								
892	33								
891	34								
890	35								
889	36								
888	37								
887	38								
886	39								
	40								

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: KGHM Ajax Mining Inc.

Print Date: 5/28/2015

AJAX (HYDROGEO) AJAX_SOIL_HYDROGEO.GDL BGC.GDT 5/28/15

DRILL HOLE # BGC14-002S

Coordinates (m): 682756E - 5608900N
Ground Elevation (m): 925
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.85

Location: TSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 4.57

Start Date: 13 Feb 2014
Finish Date: 13 Feb 2014
Final Depth (m): 15.70
Depth to Top of Rock (m): 15.24
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
925	0				SAND (SW) Fine to medium, some fine gravel, some silt, light brown. [FILL]	0	At grade, dry	13/02/2014 14:00	
924	1								
					GRAVEL (GP) Fine, some medium to coarse sand, trace silt, poorly graded, light brown with grey clasts, maximum particle size is 10 mm. [FLUVIAL]		Dry	13/02/2014 14:05	
923	2								
922	3						Dry	13/02/2014 14:07	
921	4								
920	5						Dry	13/02/2014 14:11	Welding time 14:13 to 14:30.
919	6				SILT (ML) Some gravel, trace fine sand, trace clay, well graded, low plasticity, dark brown with dark grey clasts. [TILL]		Moist	13/02/2014 14:33	
						6.71			
918	7								
					Below 7.62 m - increase in gravel content to gravelly, clasts are dark to light grey.		Moist	13/02/2014 14:35	
917	8								At 7.87 m - static water level, measured 3/3/2014 15:11.
						8.53			
916	9					9.09			
					Below 9.14 m - significant decrease in gravel content to trace, increase in clay content to some, increase in moisture content.		Moist	13/02/2014 14:38	
	10								

(Continued on next page)

DRILL HOLE # BGC14-002S

Coordinates (m): 682756E - 5608900N
Ground Elevation (m): 925
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.85

Location: TSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 4.57

Start Date: 13 Feb 2014
Finish Date: 13 Feb 2014
Final Depth (m): 15.70
Depth to Top of Rock (m): 15.24
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
915	10								
					Below 10.67 m - colour change of matrix from dark brown to dark grey.		Moist	13/02/2014 14:40	Welding time 14:41 to 14:55.
914	11								
913	12						Moist	13/02/2014 14:58	
912	13								
911	14						Moist	13/02/2014 15:01	
910	15				Below 14.78 m - slight increase in moisture content.		Moist	13/02/2014 15:03	
						15.19			
					BEDROCK Drill cuttings: fine to coarse grained, light reddish brown to organish brown, slightly to moderately weathered, some oxidation. [NICOLA VOLCANICS]		Dry	13/02/2014 15:05	
909	16				END OF HOLE AT 15.70 m				
908	17				NOTES: 1. 2" PVC standpipe piezometer installed with screen from 9.09 to 15.19 metres. 2. Filter sand placed from 8.53 to 15.70 metres. 3. Bentonite seal placed from 6.71 to 8.53 metres.				
907	18								
906	19								
	20								

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: KGHM Ajax Mining Inc.
Print Date: 5/28/2015

Project No.: 1125-007
Project: Ajax Project Environmental Assessment

DRILL HOLE # BGC14-003D

Location: Ajax Project Site

Coordinates (m): 683544E - 5608858N
Ground Elevation (m): 897
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 1.2

Location: TSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 3.04

Start Date: 14 Feb 2014
Finish Date: 14 Feb 2014
Final Depth (m): 32.34
Depth to Top of Rock (m): 21.95
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
897	0				SAND (SW) Gravelly, silty, well graded, light brown with grey clasts, trace organics (rootlets 1 mm diameter). [TOPSOIL]	0	Dry	14/02/2014 08:17	Logged from sump.
896	1								
		G	G1				Dry	14/02/2014 08:22	
895	2								
894	3				SILT (ML) Some gravel, some fine sand, trace to some clay, low plasticity, dark brown matrix with grey pockets and grey clasts. [TILL]		Dry	14/02/2014 08:24	
		G	G2				Dry	14/02/2014 08:25	
893	4								
		G	G3		Below 4.57 m - decrease in clay content.		Moist	14/02/2014 08:27	At 4.43 m - static water level, measured 5/7/2014 9:16. Welding time 8:28 to 8:48.
892	5								
891	6				Below 5.79 m - colour change to dark greyish brown.				
		G	G4				Moist	14/02/2014 08:50	
890	7								
889	8						Moist	14/02/2014 08:52	
888	9								
		G	G5				Dry to moist	14/02/2014 08:57	
887	10								

(Continued on next page)

DRILL HOLE # BGC14-003D

Coordinates (m): 683544E - 5608858N
Ground Elevation (m): 897
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 1.2

Location: TSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 3.04

Start Date: 14 Feb 2014
Finish Date: 14 Feb 2014
Final Depth (m): 32.34
Depth to Top of Rock (m): 21.95
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
	10				Below 10.36 m - decrease in gravel content to trace, colour change to dark brown.		Moist	14/02/2014 09:03	Welding time 9:04 to 9:20.
886	11								
					SAND (SM) Coarse, some silt, trace gravel, dark greyish brown. [TILL]				
885	12						Moist	14/02/2014 09:23	
884	13								
883	14				Below 13.72 m - sand is medium, increase in silt content to silty, medium plasticity.		Moist	14/02/2014 09:25	
882									
	15	G	G6		SILT (ML) Clayey, some fine sand, dark grey, low plasticity. [TILL]		Moist	14/02/2014 09:35	
881	16								
880	17	G	G7		Below 16.76 m - trace gravel, decrese in clay content to some. ▽		Moist	14/02/2014 09:37	Welding time 9:48 to 10:00.
					GRAVEL AND SAND (GM) Silty, sand is coarse, gravel is coarse to fine, dark grey. [FLUVIAL]		Wet-water encountered at 17.07 m bgs.	14/02/2014 10:02	Estimated inflow 3-4 US GPM.
879	18								
		G	G8				Wet	14/02/2014 10:06	
878	19								
877		G			Below 19.81 m - increase in clay content to trace, sand is coarse, slight colour		Wet	14/02/2014 10:12	
	20								

(Continued on next page)

DRILL HOLE # BGC14-003D

Coordinates (m): 683544E - 5608858N
Ground Elevation (m): 897
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 1.2

Location: TSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 3.04

Start Date: 14 Feb 2014
Finish Date: 14 Feb 2014
Final Depth (m): 32.34
Depth to Top of Rock (m): 21.95
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
876	20	G	G9		change to lighter greyish brown.				
	21								
875		G	G10		SILT (ML) Gravelly, sandy, sand is fine to medium, grey with pockets of brown silt. [TILL]		Dry to moist	14/02/2014 10:17	
	22				WEATHERED BEDROCK Drill cuttings: sandy, sand is fine to medium, some coarse gravel, uniform light greyish green. [NICOLA VOLCANICS]		Dry	14/02/2014 10:21	Qualities of soil, logged as a soil.
874	23	G	G11						
873	24								
		G	G12			24.38	Dry	14/02/2014 10:30	Highly chloritized bedrock?
872	25								
871	26	G	G13				Dry	14/02/2014 10:39	
870	27					26.21			
		G	G14		BEDROCK Drill cuttings: fine grained, angular to subrounded, light grey, maximum particle size is 10 mm, fresh and unweathered. [NICOLA VOLCANICS]		Dry	14/02/2014 10:40	Competent bedrock surface.
869	28					28.35			
868	29	G	G15				Dry	14/02/2014 10:45	
867	30								

(Continued on next page)

DRILL HOLE # BGC14-003D

Coordinates (m): 683544E - 5608858N
Ground Elevation (m): 897
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 1.2

Location: TSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 3.04

Start Date: 14 Feb 2014
Finish Date: 14 Feb 2014
Final Depth (m): 32.34
Depth to Top of Rock (m): 21.95
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
866	30						Dry		
	31					31.39			
865	32								
864	33				END OF HOLE AT 32.34 m NOTES: 1. 2"PVC sandpipe piezometer installed with screen from 28.35 to 31.39 metres. 2. Filter sand placed from 26.21 to 32.34 metres. 3. Bentonite seal placed from 24.38 to 26.21 metres.				
863	34								
862	35								
861	36								
860	37								
859	38								
858	39								
857	40								

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: KGHM Ajax Mining Inc.
Print Date: 5/28/2015

Project No.: 1125-007

Project: Ajax Project Environmental Assessment

DRILL HOLE # BGC14-003I

Location: Ajax Project Site

Coordinates (m): 683544E - 5608858N
Ground Elevation (m): 897
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.82

Location: TSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 11.28

Start Date: 17 Feb 2014
Finish Date: 17 Feb 2014
Final Depth (m): 21.95
Depth to Top of Rock (m): 20.11
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
897	0				SAND (SW) Gravelly, silty, well graded, light brown with grey clasts, trace organics (rootlets 1 mm diameter). [TOPSOIL]	0	Dry	17/02/2014 08:11	Logged from sump.
896	1								
							Dry	17/02/2014 08:15	
895	2								
894	3				SILT (ML) Some gravel, some fine sand, trace clay, low plasticity, dark brown with grey clasts. [TILL]		Dry	17/02/2014 08:17	
							Dry	17/02/2014 08:18	
893	4								
							Dry	17/02/2014 08:21	At 4.43 m - static water level, measured 3/2/2014 8:00. Welding time 8:23 to 8:52.
892	5								
891	6				Below 6.10 m - decrease in sand content to trace, colour change of matrix to dark grey.		Moist	17/02/2014 08:54	
890	7								
889	8						Moist	17/02/2014 08:56	
888	9								
							Slightly moist	17/02/2014 08:59	
887	10								

(Continued on next page)

DRILL HOLE # BGC14-003I

Coordinates (m): 683544E - 5608858N
Ground Elevation (m): 897
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.82

Location: TSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 11.28

Start Date: 17 Feb 2014
Finish Date: 17 Feb 2014
Final Depth (m): 21.95
Depth to Top of Rock (m): 20.11
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
	10								
					Below 10.36 m - decrease in gravel content to trace, colour change of matrix to light brown.		Slightly moist	17/02/2014 09:01	
886	11								
					SAND (SM) Fine to coarse, some silt, trace clay, dark greyish brown. [TILL]		Moist	17/02/2014 09:02	Welding time 9:03 to 9:25.
885	12						Moist	17/02/2014 09:27	
884	13								
883							Moist	17/02/2014 09:28	
	14					14.02			
882									
	15				SILT Sandy, some clay to clayey, sand is fine, medium plasticity, dark grey. [TILL]		Moist	17/02/2014 09:34	
							Moist	17/02/2014 09:35	
881	16					15.54			
880					Below 16.76 m - gravelly, some clay.	16.76	Moist	17/02/2014 09:38	
	17								
879					GRAVEL AND SAND (GM) Silty, sand is coarse, dark grey. [FLUVIAL/GLACIOFLUVIAL]		Wet		At 16.67 m - water encountered at unit change.
	18				Below 18.29 m - increase in clay content to trace.		Wet	17/02/2014 10:10	Welding time 9:41 to 10:06.
878	19								
877					Below 19.81 m - decrease in silt content to trace, sand is coarse, gravel is fine,	19.81	Wet	17/02/2014 10:16	
	20								

(Continued on next page)

DRILL HOLE # BGC14-003I

Coordinates (m): 683544E - 5608858N
Ground Elevation (m): 897
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.82

Location: TSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 11.28

Start Date: 17 Feb 2014
Finish Date: 17 Feb 2014
Final Depth (m): 21.95
Depth to Top of Rock (m): 20.11
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
	20				maximum particle size is 5 mm.				
876	21				BEDROCK Drill cuttings: fine grained, light grey, fresh and unweathered. [NICOLA VOLCANICS]	20.42	Dry	17/02/2014 10:18	Cuttings are dry, dusty.
875	22				END OF HOLE AT 21.95 m NOTES: 1. 2" PVC standpipe piezometer installed with screen from 16.76 to 19.81 metres. 2. Filter sand placed from 15.54 to 20.42 metres. 3. Bentonite seal placed from 14.02 to 15.54 metres. 4. Hole backfilled from 20.42 m to 21.95 m with bentonite chips.		Dry	17/02/2014 10:20	
874	23								
873	24								
872	25								
871	26								
870	27								
869	28								
868	29								
867	30								

DRILL HOLE # BGC14-003S

Coordinates (m): 683544E - 5608858N
Ground Elevation (m): 897
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.8

Location: TSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 3.04

Start Date: 14 Feb 2014
Finish Date: 14 Feb 2014
Final Depth (m): 11.28
Depth to Top of Rock (m): N/A
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
896	0	SAND (SW) Gravelly, some silt, well graded, light brown with grey clasts, trace organics (rootlets <2 mm diameter). [TOPSOIL]	0	Dry	14/02/2014 14:54	
895	1					
894	2					
893	3	SILT Some gravel, some fine sand, trace clay, dark brown with grey clasts. [TILL]		Dry	14/02/2014 14:56	
892	4			Moist	14/02/2014 14:59	
891	5	Below 4.57 m - increase in sand content to sandy, light brown with grey clasts.		Dry	14/02/2014 15:04	At 4.43 m - static water level, measured 3/11/2014 9:20. Welding time 15:05 to 15:25.
890	6	Below 6.10 m - decrease in sand content, dark brown with grey clasts.		Dry	14/02/2014 15:29	
889	7		7.32			
888	8	Below 7.62 m - decrease in sand content to trace.		Dry to moist	14/02/2014 15:32	
887	9		9.14	Dry to moist	14/02/2014 15:35	
	10	Below 9.75 m - decrease in gravel content to trace.	9.75			

(Continued on next page)

DRILL HOLE # BGC14-003S

Coordinates (m): 683544E - 5608858N
Ground Elevation (m): 897
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.8

Location: TSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 3.04

Start Date: 14 Feb 2014
Finish Date: 14 Feb 2014
Final Depth (m): 11.28
Depth to Top of Rock (m): N/A
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
886	10–11						Moist	14/02/2014 15:39	
885	12				END OF HOLE AT 11.28 m NOTES: 1. 2" PVC standpipe piezometer installed with screen from 9.75 to 11.28 metres. 2. Filter sand placed from 9.14 to 11.28 metres. 3. Bentonite seal placed from 7.32 to 9.14 metres.		Moist	14/02/2014 15:40	
884	13								
883	14								
882	15								
881	16								
880	17								
879	18								
878	19								
877	20								

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: KGHM Ajax Mining Inc.
Print Date: 5/28/2015

DRILL HOLE # BGC14-004

Coordinates (m): 687746E - 5609526N
Ground Elevation (m): 871
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.86

Location: EMRSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 4.57

Start Date: 18 Feb 2014
Finish Date: 19 Feb 2014
Final Depth (m): 78.33
Depth to Top of Rock (m): 63.70
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
871	0				SAND (SW) Medium, some silt, some gravel, well graded, light brown, trace organics (rootlets). [TILL]	0	Dry	19/02/2014 19:49	Logged from pad fill.
870	1	G	G1		Below 1.52 m - organics no longer present.		Dry	19/02/2014 07:51	
869	2								
868	3				Below 3.04 m - increase in silt content, trace gravel, slightly darker brown matrix.		Dry	19/02/2014 07:52	
867	4								
866	5	G	G2		Below 4.57 m - decrease in silt content, decrease in gravel content, sand is fine, uniform.		Dry	19/02/2014 07:54	Welding time 7:56 to 8:18.
865	6				SILT (MH) Sandy, some gravel, sand is coarse, gravel is fine, well graded, dark brown matrix with grey clasts. [TILL]		Moist	19/02/2014 08:20	
864	7				Below 7.67 m - sand is medium to coarse, gravel is fine to coarse, increase in moisture.				
863	8	G	G3				Moist	19/02/2014 08:21	At 8.23 m - static water level, measured 5/13/2014 14:44.
862	9				Below 9.14 m - clayey, sand is fine, low plasticity.		Moist	19/02/2014 08:22	
	10								

(Continued on next page)

DRILL HOLE # BGC14-004

Coordinates (m): 687746E - 5609526N
Ground Elevation (m): 871
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.86

Location: EMRSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 4.57

Start Date: 18 Feb 2014
Finish Date: 19 Feb 2014
Final Depth (m): 78.33
Depth to Top of Rock (m): 63.70
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
861	10						Moist	19/02/2014 08:23	Welding time 8:24 to 8:43.
860	11								
859	12				Below 12.19 m - decrease in sand content.		Moist	19/02/2014 08:45	
858	13								
857	14	G	G4		Below 13.72 m - increase in gravel content to gravelly.		Moist	19/02/2014 08:47	
856	15	G	G5		At 15.24 m - sand is medium, colour change to dark greyish brown.		Dry to moist	19/02/2014 08:51	
855	16								
854	17	G	G6		GRAVEL (GP) Sandy, sand is medium to coarse, poorly graded, subrounded to subangular, dark brown. [FLUVIAL]		Dry	19/02/2014 08:53	Welding time 8:54 to 9:20. At 17.37 m - water encountered. AIRLIFT #1 10 US GPM 10 US GPM 11 US GPM Average 10 US GPM
853	18								
852	19	G	G7		Below 18.29 m - sand no longer present, gravel is multilithic.		Wet	19/02/2014 09:23	
	20				Below 19.81 m - coarse sand present in cuttings.		Wet, brown silty	19/02/2014 09:25	

(Continued on next page)

DRILL HOLE # BGC14-004

Coordinates (m): 687746E - 5609526N
Ground Elevation (m): 871
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.86

Location: EMRSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 4.57

Start Date: 18 Feb 2014
Finish Date: 19 Feb 2014
Final Depth (m): 78.33
Depth to Top of Rock (m): 63.70
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
851	20								
850	21	G	G8		At 21.34 m - gravel size range from 4 to 20 mm.		Wet, brown silty	19/02/2014 09:27	
849	22								
848	23	G	G9		At 22.86 m - maximum particle size is 30 mm.		Wet, clean	19/02/2014 09:29	Welding time 9:30 to 9:45.
847	24								
					Below 24.38 m - sand no longer present.		Wet, clean	19/02/2014 09:48	
846	25								
845	26				At 25.91 m - trace silt.		Wet, dark grey	19/02/2014 09:51	
844	27								
		G	G10		Below 27.43 m - silt no longer present, gravel is dark grey to black, multilithic.		Wet, brown, silty	19/02/2014 09:54	
843	28								
842	29	G	G11		Below 28.96 m - sandy, coarse.		Wet, brown, silty/clayey	19/02/2014 09:56	Welding time 9:57 to 10:22. AIRLIFT #2 80-100 US GPM
	30								

(Continued on next page)

DRILL HOLE # BGC14-004

Coordinates (m): 687746E - 5609526N
Ground Elevation (m): 871
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.86

Location: EMRSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 4.57

Start Date: 18 Feb 2014
Finish Date: 19 Feb 2014
Final Depth (m): 78.33
Depth to Top of Rock (m): 63.70
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
841	30						Wet	19/02/2014 10:26	
840	31								
839	32						Wet, clean	19/02/2014 10:29	
838	33								
							Wet, clean	19/02/2014 10:30	Welding time 10:31 to 10:49.
837	34								
836	35	G	G12				Wet, clean	19/02/2014 10:50	
835	36								
					At 36.58 m - sandy, coarse.		Wet, dark grey	19/02/2014 10:51	
834	37								
833	38						Wet, clean	19/02/2014 11:04	
832	39								
		G	G13				Wet, clean	19/02/2014 11:09	Welding time 11:10 to 11:40.
	40								

(Continued on next page)

DRILL HOLE # BGC14-004

Coordinates (m): 687746E - 5609526N
Ground Elevation (m): 871
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.86

Location: EMRSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 4.57

Start Date: 18 Feb 2014
Finish Date: 19 Feb 2014
Final Depth (m): 78.33
Depth to Top of Rock (m): 63.70
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
831	40								AIRLIFT #3 33 US GPM 30 US GPM 27 US GPM Average 30 US GPM
830	41						Wet, clean	19/02/2014 11:41	
829	42								
828	43						Wet	19/02/2014 11:43	
827	44								
826	45						Wet, clean	19/02/2014 11:50	
825	46								
824	47						Wet	19/02/2014 11:55	
823	48								
822	49	G	G14				Wet, clean	19/02/2014 11:57	Welding time 11:58 to 12:16.
	50						Wet, light grey	19/02/2014 12:20	

(Continued on next page)

DRILL HOLE # BGC14-004

Coordinates (m): 687746E - 5609526N
Ground Elevation (m): 871
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.86

Location: EMRSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 4.57

Start Date: 18 Feb 2014
Finish Date: 19 Feb 2014
Final Depth (m): 78.33
Depth to Top of Rock (m): 63.70
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
821	50						Wet, clean	19/02/2014 12:23	
820	51								
819	52						Wet, clean	19/02/2014 12:26	
818	53								
							Wet, dark grey	19/02/2014 12:29	Welding time 12:36 to 12:55.
817	54						Wet, clean	19/02/2014 12:30	AIRLIFT #4 50 US GPM 60 US GPM 43 US GPM Average 50 US GPM
816	55						Wet	19/02/2014 12:57	
815	56				At 56.39 m - driller described as tough, cohesive drilling, resembled compacted gravel.		Wet	19/02/2014 13:01	
814	57								
813	58						Wet, clean	19/02/2014 13:05	
812	59								
							Wet, clean	19/02/2014 13:08	Welding time 13:09 to 13:32.
	60								

(Continued on next page)

DRILL HOLE # BGC14-004

Coordinates (m): 687746E - 5609526N
Ground Elevation (m): 871
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.86

Location: EMRSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 4.57

Start Date: 18 Feb 2014
Finish Date: 19 Feb 2014
Final Depth (m): 78.33
Depth to Top of Rock (m): 63.70
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
811	60								
810	61						Wet	19/02/2014 13:43	
809	62								
808	63				At 62.48 m - maximum particle size is 40 mm.		Wet	19/02/2014 13:48	
807	64				BEDROCK Drill cuttings: fine to medium grained, angular to subrounded, dark grey, fresh and unweathered.		Wet, clean water	19/02/2014 13:51	Changing drill bit 13:53 to 14:30.
806	65								
805	66	G	G15		Below 65.53 m - green with orangish speckling, slightly weathered to unweathered.		Wet, light grey, silty	19/02/2014 14:34	
804	67	G	G16		Below 67.06 m - orangish brown mineralization (not iron staining), angular.	66.9	Wet, light grey	19/02/2014 14:37	
803	68					68.28			
802	69	G	G17		Below 68.58 m - grey.		Wet, cleaner than above	19/02/2014 14:40	
	70								

(Continued on next page)

DRILL HOLE # BGC14-004

Coordinates (m): 687746E - 5609526N
Ground Elevation (m): 871
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.86

Location: EMRSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 4.57

Start Date: 18 Feb 2014
Finish Date: 19 Feb 2014
Final Depth (m): 78.33
Depth to Top of Rock (m): 63.70
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
801	70	G	G18				Wet, light grey	19/02/2014 14:49	
800	71								
		G	G19				Wet, light grey	19/02/2014 14:47	
799	72					72.24			
798	73	G	G20		Below 73.15 m - dark green.		Wet	19/02/2014 14:50	
797	74								
		G	G21		Below 74.68 m - grey to dark grey.		Wet, grey	19/02/2014 14:55	
796	75								
795	76								
		G	G22				Wet, light grey	19/02/2014 15:03	
794	77								
793	78	G	G23				Wet	19/02/2014 15:08	
792	79				END OF HOLE AT 78.33 m NOTES: 1. 4" PVC standpipe piezometer installed with screen from 72.24 to 78.33 metres. 2. Filter sand placed from 68.28 to 78.33 metres. 3. Bentonite seal placed from 66.90 to 68.28 metres.		Wet	19/02/2014 15:10	AIRLIFT #5 4 US GPM 4.4 US GPM 4.2 US GPM Average US 4.2 GPM
	80								

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: KGHM Ajax Mining Inc.
Print Date: 5/28/2015

AJAX (HYDROGEO) AJAX_SOIL_HYDROGEO.GDL BGC.GDT 5/28/15

DRILL HOLE # BGC14-005

Coordinates (m): 687161E - 5609519N
Ground Elevation (m): 878
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.86

Location: EMRSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 4.57

Start Date: 19 Feb 2014
Finish Date: 20 Feb 2014
Final Depth (m): 50.46
Depth to Top of Rock (m): 43.28
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
877	0				SILT (ML) Sandy, some gravel, sand is fine, well graded, nonplastic, gravel is rounded, light brown with grey clasts. [TILL]	0	Dry	19/02/2014 15:22	
876	1	G	G1				Dry	19/02/2014 15:24	
875	2								
874	3						Dry	19/02/2014 15:26	
873	4	G	G2		CLAY (CI) Silty, some fine sand, trace gravel, medium plasticity, light greyish brown. [TILL]		Dry to moist	19/02/2014 15:28	Welding time 15:30 to 15:50.
872	5								
871	6						Dry	19/02/2014 15:52	
870	7	G	G3		SILT (ML) Sandy, some clay, trace gravel, sand is fine, light brown with grey clasts. [TILL]		Dry	19/02/2014 15:55	
869	8								
868	9	G	G4		SAND (SW) Fine, silty, some gravel, well graded, light brown. [TILL]		Dry	19/02/2014 15:59	
	10								

(Continued on next page)

DRILL HOLE # BGC14-005

Coordinates (m): 687161E - 5609519N
Ground Elevation (m): 878
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.86

Location: EMRSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 4.57

Start Date: 19 Feb 2014
Finish Date: 20 Feb 2014
Final Depth (m): 50.46
Depth to Top of Rock (m): 43.28
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
867	10				Below 10.67 m - decrease in silt.		Dry	19/02/2014 16:02	Welding time 16:05 to 16:28.
866	11								
865	12						Dry	19/02/2014 16:31	
864	13								
863	14	G	G5		SAND (SP) Trace gravel, trace silt, uniformly graded, light brown. [GLACIOFLUVIAL]		Dry	19/02/2014 16:35	
862	15				Below 15.24 m - increase in gravel content.		Dry	19/02/2014 16:38	
861	16					▼			At 16.08 m - static water level, measured 3/24/2014 15:50.
860	17				Below 16.76 m - slight increase in silt content.		Dry	19/02/2014 16:42	
859	18				Below 18.29 m - silty, dark greyish brown.		Dry to moist	20/02/2014 07:33	
858	19								
	20						Dry	20/02/2014 07:37	

(Continued on next page)

DRILL HOLE # BGC14-005

Coordinates (m): 687161E - 5609519N
Ground Elevation (m): 878
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.86

Location: EMRSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 4.57

Start Date: 19 Feb 2014
Finish Date: 20 Feb 2014
Final Depth (m): 50.46
Depth to Top of Rock (m): 43.28
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
857	20								
	21								
		G	G6		SAND (SM) Fine, some silt, uniformly graded, light brown. [GLACIOFLUVIAL]		Dry	20/02/2014 07:40	
856	22								
855	23				Below 27.86 m - colour change to grey.		Dry to moist	20/02/2014 07:43	Colour change. Welding time 7:45 to 8:05.
854	24								
							Dry	20/02/2014 08:07	
853	25								
852	26						Dry	20/02/2014 08:11	
851	27								
							Dry	20/02/2014 08:13	
850	28								
849	29								
		G	G7		SILT (ML) Sandy, sand is fine, uniformly graded, low plasticity, grey to dark grey. [TILL]		Dry	20/02/2014 08:15	Welding time 8:19 to 8:36.
848	30								

(Continued on next page)

DRILL HOLE # BGC14-005

Coordinates (m): 687161E - 5609519N
Ground Elevation (m): 878
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.86

Location: EMRSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 4.57

Start Date: 19 Feb 2014
Finish Date: 20 Feb 2014
Final Depth (m): 50.46
Depth to Top of Rock (m): 43.28
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
	30								
847					Below 30.48 m - trace to some clay, increase in moisture content.		Moist	20/02/2014 08:39	
	31								
846									
	32	G	G8		Below 32.00 m - slight increase in clay to some.		Moist	20/02/2014 08:43	
845									
	33								
844					Below 33.53 m - slight increase in moisture content.		Moist	20/02/2014 08:47	Slightly more moist than above.
	34								
843									
	35						Moist	20/02/2014 08:52	
842						▽	Wet	20/02/2014 08:54	Welding time 8:54 to 9:14.
	36								At 35.66 m - water encountered. Inadequate quantity of water to complete Airlift test.
841							Wet, dark grey, silty	20/02/2014 09:18	
	37								
840									
	38						Wet, dark grey, silty	20/02/2014 09:24	
839									
	39								
838		G	G9				Wet, dark grey, silty	20/02/2014 09:28	
	40								

(Continued on next page)

DRILL HOLE # BGC14-005

Coordinates (m): 687161E - 5609519N
Ground Elevation (m): 878
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.86

Location: EMRSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 4.57

Start Date: 19 Feb 2014
Finish Date: 20 Feb 2014
Final Depth (m): 50.46
Depth to Top of Rock (m): 43.28
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
837	40								
	41				Below 41.15 m - decrease in moisture content.		Moist	20/02/2014 09:32	Welding time 9:33 to 10:00.
836	42								
835	43						Wet, dark grey, silty	20/02/2014 10:05	
834	44				BEDROCK Drill cuttings: fine to medium grained, angular to subrounded, dark grey, slightly weathered. [IRONMASK HYBRID]		Wet	20/02/2014 10:10	
		G	G10				Wet	20/02/2014 10:11	Changing drill bit 10:15 to 10:45.
833	45					44.5			
832		G	G11		Below 45.72 m - fine to coarse, dark grey to orangish brown, multilithic.		Wet, light grey	20/02/2014 10:49	
	46					46.02			
831	47								
		G	G12		Below 47.24 m - light greenish grey.	47.24	Wet, light grey	20/02/2014 10:51	
830	48								
829		G	G13				Wet, light greenish grey	20/02/2014 10:53	AIRLIFT #1 0.7 US GPM 1.0 US GPM 0.8 US GPM Average 0.8 US GPM
828	49								
	50								

(Continued on next page)

DRILL HOLE # BGC14-005

Coordinates (m): 687161E - 5609519N
Ground Elevation (m): 878
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.86

Location: EMRSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 4.57

Start Date: 19 Feb 2014
Finish Date: 20 Feb 2014
Final Depth (m): 50.46
Depth to Top of Rock (m): 43.28
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
	50								
827	51				END OF HOLE AT 50.46 m NOTES: 1. 4" PVC standpipe piezometer installed with screen from 47.24 to 50.46 metres. 2. Filter sand placed from 46.02 to 50.46 metres. 3. Bentonite seal placed from 44.50 to 46.02 metres.				
826	52								
825	53								
824	54								
823	55								
822	56								
821	57								
820	58								
819	59								
818	60								

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Client: KGHM Ajax Mining Inc.
Print Date: 5/28/2015

DRILL HOLE # BGC14-006D

Coordinates (m): 687288E - 5610779N
Ground Elevation (m): 940
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.76

Location: EMRSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 4.57

Start Date: 21 Feb 2014
Finish Date: 22 Feb 2014
Final Depth (m): 29.56
Depth to Top of Rock (m): 14.02
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
940	0				SAND (SW) Fine, silty, some fine to coarse gravel, well graded, light brown with grey and brown clasts. [TOPSOIL]	0	Dry	22/02/2014 09:08	
939	1	G	G1				Dry	22/02/2014 09:12	
	2								
938					SILT (ML) Sandy, trace to some clay, trace gravel, sand is fine, well graded, low plasticity, light brown with grey clasts. [TILL]		Dry to slightly moist	22/02/2014 09:14	
	3								
937		G	G2				Dry to slightly moist	22/02/2014 09:16	
	4								
936									
	5	G	G3		SAND (SP) Fine, gravelly, gravel is fine to coarse, trace silt, uniformly graded, light brown with grey clasts. [TILL]		Dry	22/02/2014 09:20	Welding time 9:22 to 9:44.
935									
	6								
934					GRAVEL (GP) Fine to coarse, trace fine sand, trace silt, uniformly graded, light brown and grey clasts. [GLACIOFLUVIAL]		Dry	22/02/2014 09:47	
	7								
933		G	G4				Dry	22/02/2014 09:19	
	8								
932									
	9								At 8.64 m - static water level, measured 5/24/2014 12:01.
931		G	G5		SAND AND GRAVEL (GM) Some silt, trace clay, sand is fine to medium, gravel is fine to coarse, well graded, light brown. [TILL]		Dry	22/02/2014 09:52	
					SAND (SM)		Dry	22/02/2014 09:53	
	10								

(Continued on next page)

DRILL HOLE # BGC14-006D

Coordinates (m): 687288E - 5610779N
Ground Elevation (m): 940
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.76

Location: EMRSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 4.57

Start Date: 21 Feb 2014
Finish Date: 22 Feb 2014
Final Depth (m): 29.56
Depth to Top of Rock (m): 14.02
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
930	10				Fine, silty, some fine to coarse gravel, well graded, light grey [TILL]				
		G	G6				Dry	22/02/2014 09:55	
929	11								
	12						Dry	22/02/2014 10:17	
928									
	13					▽	Moist	22/02/2014 10:19	At 13.1 m - water encountered.
927		G	G7						
	14				BEDROCK		Moist	22/02/2014 10:21	Changing drill bit 10:25 to 10:45.
926					Drill cuttings: fine to medium grained, greyish green and reddish brown, slightly to moderately weathered. [IRONMASK HYBRID]		Wet, brown, silty	22/02/2014 10:47	AIRLIFT #1 1 drop/sec
	15								
925		G	G8		Below 15.24 m - fine, angular, light grey, fresh and unweathered.		Dry	22/02/2014 10:50	
	16								
924									
	17						Dry	22/02/2014 10:52	
923						17.37			
	18								
922		G	G9				Dry	22/02/2014 10:56	
	19								
921					From 19.20 m to 27.43 m - brown fine sand and silt present in cuttings, gravel is subangular to rounded, moderately weathered.	19.2	Dry	22/02/2014 10:57	Possible fault.
	20	G					Dry	22/02/2014 10:58	

(Continued on next page)

DRILL HOLE # BGC14-006D

Coordinates (m): 687288E - 5610779N
Ground Elevation (m): 940
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.76

Location: EMRSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 4.57

Start Date: 21 Feb 2014
Finish Date: 22 Feb 2014
Final Depth (m): 29.56
Depth to Top of Rock (m): 14.02
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
920	20	G	G10			20.42			
919	21	G	G11		Below 21.34 m - slight decrease in sand content.		Dry	22/02/2014 11:01	Weathered zone.
918	22								
917	23	G	G12		Below 22.86 m - colour change to reddish purple.		Dry	22/02/2014 11:03	Weathered zone.
916	24								
915	25	G	G13		Below 22.86 m - reddish brown, silt and fine sand present in cuttings, clasts are subrounded, slight increase in moisture, indicated by darker colour.		Dry to moist	22/02/2014 11:09	Weathered zone.
914	26	G	G14				Dry to moist	22/02/2014 11:11	Weathered zone.
913	27	G	G15		At 27.43 m - end of weathered zone, colour change back to light grey, angular, unweathered.	26.52	Dry	22/02/2014 11:16	End of weathered zone.
912	28								
911	29	G	G16				Dry	22/02/2014 11:19	
	30				END OF HOLE AT 29.56 m				AIRLIFT #2 0.04 US GPM Inflow possibly from

(Continued on next page)

DRILL HOLE # BGC14-006D

Coordinates (m): 687288E - 5610779N
Ground Elevation (m): 940
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.76

Location: EMRSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 4.57

Start Date: 21 Feb 2014
Finish Date: 22 Feb 2014
Final Depth (m): 29.56
Depth to Top of Rock (m): 14.02
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
910	30				NOTES: 1. 4" PVC standpipe piezometer installed with screen from 20.42 to 26.52 metres. 2. Filter sand placed from 19.20 to 29.56 metres. 3. Bentonite seal placed from 17.37 to 19.20 metres.				upper unit.
909	31								
908	32								
907	33								
906	34								
905	35								
904	36								
903	37								
902	38								
901	39								
	40								

Project No.: 1125-007
Project: Ajax Project Environmental Assessment

DRILL HOLE # BGC14-006S

Location: Ajax Project Site

Coordinates (m): 687288E - 5610779N
Ground Elevation (m): 940
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.8

Location: EMRSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 4.57

Start Date: 22 Feb 2014
Finish Date: 22 Feb 2014
Final Depth (m): 14.33
Depth to Top of Rock (m): 14.02
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
940	0				SAND(SW) Fine, silty, some fine to coarse gravel, well graded, light brown with grey clasts. [TOPSOIL]	0	Dry	22/02/2014 11:09	
939	1						Dry	22/02/2014 11:12	
	2								
938					SILT (ML) Sandy, trace clay, trace gravel, sand is fine, well graded, low plasticity, light brown to brown with grey clasts. [TILL]		Dry	22/02/2014 11:14	
	3								
937							Dry	22/02/2014 11:17	
	4								
936									
	5				SAND (SP) Fine, gravelly, trace silt, gravel is fine to coarse, uniformly graded, brown with grey clasts, clasts are subangular. [TILL]		Dry	22/02/2014 11:20	Welding time 11:21 to 11:43.
935									
	6								
934					GRAVEL (GP) Fine to coarse, trace to some fine sand, trace silt, uniformly graded, light brown with grey clasts. [GLACIOFLUVIAL]		Dry	22/02/2014 11:45	
	7								
933						7.62			
	8						Dry	22/02/2014 11:50	
932									
	9								
931					SAND AND GRAVEL (GM) Some silt, trace clay, sand is fine to medium, gravel is fine to coarse, well graded, light greyish brown. [TILL]	9.45	Dry	22/02/2014 11:53	At 9.15 m - static water level, measured 6/1/2014 11:15.
	10				SAND (SW)		Dry	22/02/2014 11:54	

(Continued on next page)

DRILL HOLE # BGC14-006S

Coordinates (m): 687288E - 5610779N
Ground Elevation (m): 940
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.8

Location: EMRSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 4.57

Start Date: 22 Feb 2014
Finish Date: 22 Feb 2014
Final Depth (m): 14.33
Depth to Top of Rock (m): 14.02
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
930	10				Fine, silty, some fine to coarse gravel, well graded, light grey. [TILL]		Dry	22/02/2014 11:55	Welding time 11:55 to 12:15.
929	11					10.97			
928	12				Below 12.19 m - increase in gravel content to gravelly.		Dry	22/02/2014 12:18	
927	13				Below 13.11 m - colour change to light greyish brown.		Dry	22/02/2014 12:21	
926	14				BEDROCK Drill cuttings: fine to medium grained, greyish green and reddish brown cuttings, slightly to moderately weathered. [IRONMASK HYBRID]	14.02	Dry	22/02/2014 12:23	
925	15				END OF HOLE AT 14.33 m NOTES: 1. 4" PVC standpipe piezometer installed with screen from 10.97 to 14.02 metres. 2. Filter sand placed from 9.45 to 14.33 metres. 3. Bentonite seal placed from 7.62 to 9.45 metres.		Dry	22/02/2014 12:25	
924	16								
923	17								
922	18								
921	19								
	20								

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Client: KGHM Ajax Mining Inc.
Print Date: 5/28/2015

DRILL HOLE # BGC14-007D

Coordinates (m): 685324E - 5608722N
Ground Elevation (m): 924
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.76

Location: SMRSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 4.57

Start Date: 23 Feb 2014
Finish Date: 23 Feb 2014
Final Depth (m): 29.56
Depth to Top of Rock (m): 24.38
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
	0				SAND (SW) Gravelly, silty, well graded, organics (rootlets, grasses) [TOPSOIL]	0	At grade, dry	23/02/2014 08:58	
924					GRAVEL (GP) Some sand, uniformly graded, angular to subrounded, grey, multilithic gravel cuttings. [GLACIOFLUVIAL]				
	1								
923		G	G1				Dry	23/02/2014 09:00	
	2								
922									
	3	G	G2		SILT (ML) Gravelly, some fine sand, gravel is fine to coarse, low plasticity, light brown to brown with grey clasts. [TILL]		Dry	23/02/2014 09:03	
921									
	4								
920		G	G3		Below 4.27 m - decrease in gravel content, slightly darker brown.		Dry	23/02/2014 09:06	Welding time 9:07 to 9:48.
	5								
919									
	6				Below 6.10 m - dark brown with grey clasts, increase in moisture content.		Dry to moist	23/02/2014 09:52	
918									
	7								
917		G	G4		Below 7.62 m - dark greyish brown.		Dry to moist	23/02/2014 09:54	
	8								
916									
	9						Dry to moist	23/02/2014 09:57	
915									
	10								

(Continued on next page)

DRILL HOLE # BGC14-007D

Coordinates (m): 685324E - 5608722N
Ground Elevation (m): 924
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.76

Location: SMRSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 4.57

Start Date: 23 Feb 2014
Finish Date: 23 Feb 2014
Final Depth (m): 29.56
Depth to Top of Rock (m): 24.38
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
914	10								
		G	G5		Below 10.67 m - decrease in gravel content, dark grey.		Dry to moist	23/02/2014 10:00	Welding time 10:02 to 10:34.
913	11								
	12				Below 12.19 m - decrease in gravel to trace.		Dry to moist	23/02/2014 10:39	
912									
911	13								
	14	G	G6				Dry to moist	23/02/2014 10:42	
910									
909	15				Below 15.24 m - slight increase in gravel content.		Dry to moist	23/02/2014 10:48	
908	16								
	17	G	G7				Dry to moist	23/02/2014 10:54	Welding time 10:55 to 11:19.
907									
	18								
906		G	G8		BOULDER Drill cuttings: fine, unweathered, angular, dark grey.		Dry	23/02/2014 11:25	Changing drill bit 11:27 to 11:55.
	19				SILT (ML) Gravelly, gravel is fine to coarse, uniformly graded, light brown with brown and grey clasts. [TILL]				
905									
	20						Dry	23/02/2014 12:03	

(Continued on next page)

DRILL HOLE # BGC14-007D

Coordinates (m): 685324E - 5608722N
Ground Elevation (m): 924
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.76

Location: SMRSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 4.57

Start Date: 23 Feb 2014
Finish Date: 23 Feb 2014
Final Depth (m): 29.56
Depth to Top of Rock (m): 24.38
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
904	20								
	21						Dry	23/02/2014 12:14	Below 21.34 m - very little cuttings recovered, most cuttings blown away or blown out of basket.
903	22								
902	23						Dry	23/02/2014 12:22	
901	24					24.03			
900		G	G9		BEDROCK Drill cuttings: fine grained, angular, dark grey, fresh and unweathered. [NICOLA VOLCANICS]		Dry	23/02/2014 12:30	
899	25								
898	26	G	G10		Below 25.91 m - darker grey.	25.91 26.52	Dry	23/02/2014 12:36	Very little cuttings recovered.
897	27				Below 27.43 m - light grey.		Dry	23/02/2014 12:42	
896	28								
895	29						Dry	23/02/2014 12:50	
	30				END OF HOLE AT 29.56 m				

(Continued on next page)

Project No.: 1125-007

Project: Ajax Project Environmental Assessment

DRILL HOLE # BGC14-007D

Location: Ajax Project Site

Coordinates (m): 685324E - 5608722N
Ground Elevation (m): 924
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.76

Location: SMRSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 4.57

Start Date: 23 Feb 2014
Finish Date: 23 Feb 2014
Final Depth (m): 29.56
Depth to Top of Rock (m): 24.38
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
894	30				NOTES: 1. 4" PVC standpipe piezometer installed with screen from 26.52 to 29.56 metres. 2. Filter sand placed from 25.91 to 29.56 metres. 3. Bentonite seal placed from 24.03 to 25.91 metres.				
893	31								
892	32								
891	33								
890	34								
889	35								
888	36								
887	37								
886	38								
885	39								
	40								

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Client: KGHM Ajax Mining Inc.

Print Date: 5/28/2015

AJAX (HYDROGEO) AJAX_SOIL_HYDROGEO.GDL BGC.GDT 5/28/15

DRILL HOLE # BGC14-007S

Project No.: 1125-007

Project: Ajax Project Environmental Assessment

Location: Ajax Project Site

Coordinates (m): 685324E - 5608722N
Ground Elevation (m): 924
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.89

Location: SMRSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 4.57

Start Date: 23 Feb 2014
Finish Date: 23 Feb 2014
Final Depth (m): 17.37
Depth to Top of Rock (m): N/A
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
	0					0			
924					SAND (SW) Gravelly, silty, well graded, organics. [TOPSOIL]		Dry	23/02/2014 16:05	
					GRAVEL (GP) Fine to coarse, some coarse sand, gravel is grey, angular, multilithic. [FLUVIAL]				
	1								
923							Dry	23/02/2014 16:07	
	2								
922									
	3						Dry	23/02/2014 16:10	
					SILT (ML) Gravelly, gravel is fine to coarse, uniformly graded, low plasticity, light brown with grey and brown clasts. [TILL]				
921									
	4								
920							Dry	23/02/2014 16:12	Welding time 16:13 to 16:30.
	5								
919									
	6				Below 6.10 m - decrease in gravel content, trace clay, darker brown.		Dry to moist	23/02/2014 16:33	
918									
	7								
917							Dry to moist	23/02/2014 16:35	
	8								
916									
	9				Below 9.14 m - dark greyish brown.		Dry to moist	23/02/2014 16:37	
915									
	10								

(Continued on next page)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: KGHM Ajax Mining Inc.

Print Date: 5/28/2015

AJAX (HYDROGEO) AJAX_SOIL_HYDROGEO.GDL BGC.GDT 5/28/15

DRILL HOLE # BGC14-007S

Coordinates (m): 685324E - 5608722N
Ground Elevation (m): 924
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.89

Location: SMRSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 4.57

Start Date: 23 Feb 2014
Finish Date: 23 Feb 2014
Final Depth (m): 17.37
Depth to Top of Rock (m): N/A
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
914	10				At 10.67 m - decrease in gravel content, slight increase in clay.		Moist	23/02/2014 16:42	Welding time 16:43 to 17:09.
913	11					10.97			
912	12				Below 12.19 m - increase in gravel content.		Moist	23/02/2014 17:12	
911	13					12.8			
910	14				Below 13.72 m - increase in gravel content.		Moist	23/02/2014 17:15	
909	15					14.33			
908	16						Moist	23/02/2014 17:18	
907	17						Moist	23/02/2014 17:22	
906	18				END OF HOLE AT 17.37 m NOTES: 1. 4" PVC standpipe piezometer installed with screen from 14.33 to 17.37 metres. 2. Filter sand placed from 12.80 to 17.37 metres. 3. Bentonite seal placed from 10.97 to 12.80 metres.				
905	19								
	20								

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: KGHM Ajax Mining Inc.
Print Date: 5/28/2015

DRILL HOLE # BGC14-008D

Coordinates (m): 686107E - 5608923N
Ground Elevation (m): 878
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.81

Location: SMRSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 4.57

Start Date: 24 Feb 2014
Finish Date: 25 Feb 2014
Final Depth (m): 29.56
Depth to Top of Rock (m): 15.85
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
	0				SAND Gravelly, dark brown, grasses, rootlets. [TOPSOIL]	0	Moist	25/02/2014 12:30	Moist from snow.
877					SAND (SP) Fine to medium, some silt, trace coarse gravel, uniformly graded, light brown. [GLACIOFLUVIAL]		Dry	25/02/2014 12:31	
	1								
876		G	G1				Dry	25/02/2014 12:32	
	2								
875									
	3	G	G2		GRAVEL (GM) Coarse to fine, silty, some fine sand, well graded, angular, brown with brown and grey clasts. [GLACIOFLUVIAL]		Dry	25/02/2014 12:35	
874									
	4								
873					GRAVEL AND SAND (GW) Gravel is coarse, sand is coarse, trace silt, well graded, subangular, dark brown with brown and grey clasts. [GLACIOFLUVIAL]		Wet	25/02/2014 12:36	
		G	G3				Wet, dark grey, sandy	25/02/2014 12:37	At 4.57 - water encountered. AIRLIFT #1 0.03 US GPM Welding time 12:38 PM to 12:59 PM.
	5								
872									
	6								
		G	G4		SAND (SM) Fine to medium, silty, some fine to coarse gravel, well graded, greyish brown with grey clasts. [TILL]		Moist	25/02/2014 13:05	
871	7								
870		G	G5		At 7.62 m - decrease in gravel content.		Moist	25/02/2014 13:07	
	8								
869									
	9						Moist	25/02/2014 13:10	
868									
	10								

(Continued on next page)

DRILL HOLE # BGC14-008D

Coordinates (m): 686107E - 5608923N
Ground Elevation (m): 878
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.81

Location: SMRSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 4.57

Start Date: 24 Feb 2014
Finish Date: 25 Feb 2014
Final Depth (m): 29.56
Depth to Top of Rock (m): 15.85
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
867	10	G	G6		At 10.67 m - increase in gravel content.		Moist	25/02/2014 13:13	Welding time 13:15 to 13:35.
866	11								
	12								
865	13	G	G7		SILT (ML) Sandy (fine), trace to some fine to coarse gravel, well graded, greyish brown. [TILL]		Moist	25/02/2014 13:39	
864	14						Moist	25/02/2014 13:42	
863	15				At 15.24 m - sand is coarse, increase in gravel content, increase in moisture.		Moist	25/02/2014 13:47	
862	16				WEATHERED BEDROCK Drill cuttings: fine gravel, subrounded to subangular, light green, moderately to highly weathered. [IRONMASK HYBRID]		Dry	25/02/2014 13:50	Soft drilling, powdery.
861	17	G	G8				Dry	25/02/2014 13:52	Possibly chloritized Welding time 13:53 to 14:15.
860	18								
859	19	G	G9		Below 18.29 m - dark greenish grey.		Dry	25/02/2014 14:17	Powdery cuttings.
858	20	G			Below 19.81 m - dark grey.		Dry	25/02/2014 14:18	Powdery cuttings.

(Continued on next page)

DRILL HOLE # BGC14-008D

Coordinates (m): 686107E - 5608923N
Ground Elevation (m): 878
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.81

Location: SMRSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 4.57

Start Date: 24 Feb 2014
Finish Date: 25 Feb 2014
Final Depth (m): 29.56
Depth to Top of Rock (m): 15.85
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
857	20	G	G10						
	21								
856		G	G11		BEDROCK Drill cuttings: fine to medium grained, dark grey to light green, fresh and unweathered to slightly weathered. [IRONMASK HYBRID]		Dry	25/02/2014 14:21	Hard drilling.
	22								At 21.96 m - static water level, measured 5/7/2014 11:54.
855									
	23				Below 22.86 m - fine, angular, dark grey.	23.16	Dry	25/02/2014 14:24	
854									
	24								
853		G	G12		Below 24.38 m - slightly lighter grey than above.	24.99	Dry	25/02/2014 14:28	
	25								
852									
	26	G	G13				Dry	25/02/2014 14:32	
851						26.52			
	27								
850		G	G14				Dry	25/02/2014 14:36	
	28								
849									
	29						Dry	25/02/2014 14:40	
848					END OF HOLE AT 29.56 m		Dry	25/02/2014 14:42	
	30								

(Continued on next page)

Project No.: 1125-007

Project: Ajax Project Environmental Assessment

DRILL HOLE # BGC14-008D

Location: Ajax Project Site

Coordinates (m): 686107E - 5608923N
Ground Elevation (m): 878
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.81

Location: SMRSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 4.57

Start Date: 24 Feb 2014
Finish Date: 25 Feb 2014
Final Depth (m): 29.56
Depth to Top of Rock (m): 15.85
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
847	30				NOTES: 1. 4" PVC standpipe piezometer installed with screen from 26.52 to 29.56 metres. 2. Filter sand placed from 24.99 to 29.56 metres. 3. Bentonite seal placed from 23.16 to 24.99 metres.				
846	31								
845	32								
844	33								
843	34								
842	35								
841	36								
840	37								
839	38								
838	39								
	40								

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: KGHM Ajax Mining Inc.

Print Date: 5/28/2015

DRILL HOLE # BGC14-008S

Project No.: 1125-007
Project: Ajax Project Environmental Assessment

Location: Ajax Project Site

Coordinates (m): 686107E - 5608923N
Ground Elevation (m): 878
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.86

Location: SMRSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 0.91

Start Date: 25 Feb 2014
Finish Date: 25 Feb 2014
Final Depth (m): 6.10
Depth to Top of Rock (m): N/A
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
	0				SAND Gravelly, some silt, light brown, grasses and rootlets. [TOPSOIL]	0	Dry	25/02/2014 15:42	
877					SAND (SP) Fine to medium, some silt, trace coarse gravel, uniformly graded, light brown. [TILL]				
	1								
876							Dry	25/02/2014 15:44	
	2					2.13			
875									
	3				GRAVEL (GM) Fine to coarse, sandy, silty, sand is coarse, well graded, grey and brown clasts. [GLACIOFLUVIAL]		Dry	25/02/2014 15:46	
874						3.66			
	4								
873						4.57			
	5				SAND AND GRAVEL (GM) Silty, sand is fine to coarse, gravel is fine to coarse, well graded, brown with grey clasts. [GLACIOFLUVIAL]		Moist	25/02/2014 15:48	Welding time 15:49 to 16:11.
872									
	6				END OF HOLE AT 6.10 m NOTES: 1. 4" PVC standpipe piezometer installed with screen from 4.57 to 6.10 metres. 2. Filter sand placed from 3.66 to 6.10 metres. 3. Bentonite seal placed from 2.13 to 3.66 metres.		Moist	25/02/2014 16:16	
871									
	7								
870									
	8								
869									
	9								
868									
	10								

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: KGHM Ajax Mining Inc.
Print Date: 5/28/2015

AJAX (HYDROGEO) AJAX_SOIL_HYDROGEO.GDL BGC.GDT 5/28/15

DRILL HOLE # BGC14-009

Coordinates (m): 686799E - 5608547N
Ground Elevation (m): 919
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.89

Location: SMRSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 4.57

Start Date: 26 Feb 2014
Finish Date: 27 Feb 2014
Final Depth (m): 53.95
Depth to Top of Rock (m): 3.96
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
919	0				SAND (SW) Fine to coarse, some fine to coarse gravel, trace silt, well graded, light brown with grey clasts, light brown with grey clasts. [TILL]	0	Dry	26/02/2014 09:02	
918	1								
		G	G1				Dry	26/02/2014 09:04	
917	2								
916	3								
		G	G2		Below 3.04 m - increase in silt content.		Dry	26/02/2014 09:06	
915	4				WEATHERED BEDROCK Drill cuttings: fine to coarse, sandy, trace silt, sand is medium to coarse, well graded, ubangular to subrounded, greyish brown, moderately to highly weathered. [IRONMASK HYBRID]				
		G	G3				Dry	26/02/2014 09:10	Welding time 9:11 to 9:52.
914	5								
913	6				BEDROCK Drill cuttings: fine grained, angular to subangular, dark to light grey, fresh and unweathered. [IRONMASK HYBRID]		Dry	26/02/2014 09:54	Changing drill bit 9:56 to 10:16.
912	7								
		G	G4				Dry	26/02/2014 10:18	Consistently hard drilling.
911	8								
910	9								
							Dry	26/02/2014 10:20	
909	10								

(Continued on next page)

DRILL HOLE # BGC14-009

Coordinates (m): 686799E - 5608547N
Ground Elevation (m): 919
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.89

Location: SMRSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 4.57

Start Date: 26 Feb 2014
Finish Date: 27 Feb 2014
Final Depth (m): 53.95
Depth to Top of Rock (m): 3.96
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
908	10						Dry	26/02/2014 10:24	Hard drilling.
	11								
907	12	G	G5				Moist	26/02/2014 10:30	At 12.19 m - moisture encountered, unmeasurable quantity. Zone of moisture.
906	13								
905	14	G	G6		From 13.72 m to 16.76 m - fine sand, light greenish grey, moderately weathered.	▼	Dry to moist	26/02/2014 10:35	Pulverized rock, resembles sand. At 14.06 m - static water level, measured 3/26/2014 10:53.
904	15	G	G7				Dry to moist	26/02/2014 10:37	
903	16								
902	17	G	G8		Below 16.76 - fine, angular, dark grey, fresh and unweathered.		Dry to moist	26/02/2014 10:39	
901	18								
900	19	G	G9				Dry	26/02/2014 10:45	
899	20						Dry	26/02/2014 10:48	

(Continued on next page)

DRILL HOLE # BGC14-009

Coordinates (m): 686799E - 5608547N
Ground Elevation (m): 919
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.89

Location: SMRSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 4.57

Start Date: 26 Feb 2014
Finish Date: 27 Feb 2014
Final Depth (m): 53.95
Depth to Top of Rock (m): 3.96
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
898	21	G	G10				Dry	26/02/2014 10:50	
896	23				Below 22.86 m - subangular to rounded.		Dry	26/02/2014 10:52	
894	25	G	G11				Dry	26/02/2014 10:58	
893	26						Dry	26/02/2014 11:00	
891	28	G	G12				Dry	26/02/2014 11:03	
890	29						Dry	26/02/2014 11:06	

(Continued on next page)

DRILL HOLE # BGC14-009

Coordinates (m): 686799E - 5608547N
Ground Elevation (m): 919
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.89

Location: SMRSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 4.57

Start Date: 26 Feb 2014
Finish Date: 27 Feb 2014
Final Depth (m): 53.95
Depth to Top of Rock (m): 3.96
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
888	31	G	G13				Dry	26/02/2014 11:10	
887	32						Dry	26/02/2014 11:14	
886	33								
885	34	G	G14				Dry	26/02/2014 11:17	
884	35								
883	36	G	G15				Dry	26/02/2014 11:19	
882	37								
881	38								
880	39	G	G16				Dry	26/02/2014 13:15	
879	40								

(Continued on next page)

DRILL HOLE # BGC14-009

Coordinates (m): 686799E - 5608547N
Ground Elevation (m): 919
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.89

Location: SMRSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 4.57

Start Date: 26 Feb 2014
Finish Date: 27 Feb 2014
Final Depth (m): 53.95
Depth to Top of Rock (m): 3.96
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
878	41	G	G17			Dry	26/02/2014 13:19	
876	43							
875	44	G	G18	Below 44.20 m - rounded to subangular, dark greenish grey, slightly softer than previous.		Dry to slightly moist	26/02/2014 13:37	
874	45				45.11			
873	46					Dry	26/02/2014 13:31	
872	47				46.94			
		G	G19			Dry	26/02/2014 13:33	
871	48			At 47.80 m - possible fault.	47.85	Moist	26/02/2014 13:34	Driller described a moist fracture.
870	49			At 47.77 m - subrounded to rounded, dark grey.		Moist	26/02/2014 13:35	Slowing increasing moisture.
869	50							

(Continued on next page)

DRILL HOLE # BGC14-009

Coordinates (m): 686799E - 5608547N
Ground Elevation (m): 919
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.89

Location: SMRSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 4.57

Start Date: 26 Feb 2014
Finish Date: 27 Feb 2014
Final Depth (m): 53.95
Depth to Top of Rock (m): 3.96
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
	50	G	G20		At 50.46 m - increase in moisture content.		Moist	26/02/2014 13:48	
868	51								
867	52				At 51.82 m - subangular, dark greenish grey, cuttings are uniform in size.		Moist	26/02/2014 13:53	
866	53	G	G21		At 53.34 m - increase in moisture content. ▽		Wet	26/02/2014 13:58	At 53.34 m - water encountered.
865	54				END OF HOLE AT 53.95 m NOTES: 1. 2" PVC standpipe piezometer installed with screen from 47.85 to 53.95 metres. 2. Filter sand placed from 46.94 to 53.95 metres. 3. Bentonite seal placed from 45.11 to 46.94 metres.		Wet, grey, silty	26/02/2014 13:58	AIRLIFT #1 0.9 US GPM 1 US GPM 1 US GPM AVG 1 US GPM
864	55								
863	56								
862	57								
861	58								
860	59								
859	60								

DRILL HOLE # BGC14-010

Coordinates (m): 681730E - 5607414N
Ground Elevation (m): 979
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.89

Location: TSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 4.57

Start Date: 27 Feb 2014
Finish Date: 02 Mar 2014
Final Depth (m): 78.33
Depth to Top of Rock (m): 10.97
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
979	0				GRAVEL (GP) Fine to coarse, some coarse sand, subangular to rounded, brown and grey clasts. [TOPSOIL/FILL]	0	Dry	27/02/2014 13:28	
978	1								
							Dry	27/02/2014 13:31	
977	2								
					GRAVEL AND SILT (GM) Some fine to coarse sand, gravel is fine to coarse, well graded, subangular to subrounded, brown with grey and brown clasts. [TILL]		Dry to slightly moist	27/02/2014 13:34	
976	3	G	G1						
975	4								
		G	G2		SILT (ML) Some fine sand to sandy, trace fine to coarse gravel, uniformly graded, brown with grey clasts, clasts are angular to subrounded. [TILL]		Moist	27/02/2014 13:37	Welding time 13:39 to 14:02.
974	5								
973	6	G	G3		Below 6.10 m - decrease in gravel content, decrease in sand content, trace clay.		Dry	27/02/2014 14:03	
972	7								
971	8	G	G4		Below 7.62 m - clayey.		Moist	27/02/2014 14:05	Sticky, cohesive drilling.
970	9				Below 9.14 m - trace to no gravel.		Dry to moist	27/02/2014 14:06	
969	10					▼			At 9.59 m - static water level, measured.

(Continued on next page)

DRILL HOLE # BGC14-010

Coordinates (m): 681730E - 5607414N
Ground Elevation (m): 979
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.89

Location: TSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 4.57

Start Date: 27 Feb 2014
Finish Date: 02 Mar 2014
Final Depth (m): 78.33
Depth to Top of Rock (m): 10.97
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
	10								3/12/2014 10:02.
968		G	G5		Below 10.67 m - trace to some fine gravel.		Dry	27/02/2014 14:07	Changing dril bit 14:08 to 14:24.
	11				BEDROCK Drill cuttings: fine to medium grained, angular to subrounded, brown and grey clasts, moderately weathered.				
967	12	G	G6		Below 12.19 m - fine, dark grey, angular.		Dry	27/02/2014 14:32	
966	13								
965	14				Below 13.72 m - slightly lighter grey than above.		Dry	27/02/2014 14:39	
964	15	G	G7		Below 15.24m - dark grey.		Dry	27/02/2014 14:45	
963	16								
962	17	G	G8		Below 16.76 m - subrounded, light grey, average clast size is 4 mm.		Dry	27/02/2014 14:49	
961	18								
960	19	G	G9		Below 18.29 m - subrounded, whitish grey.		Dry	27/02/2014 14:55	
959	20	G			Below 19.81 m - angular to subangular, grey.		Dry	27/02/2014 15:00	

(Continued on next page)

DRILL HOLE # BGC14-010

Coordinates (m): 681730E - 5607414N
Ground Elevation (m): 979
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.89

Location: TSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 4.57

Start Date: 27 Feb 2014
Finish Date: 02 Mar 2014
Final Depth (m): 78.33
Depth to Top of Rock (m): 10.97
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
	20	G	G10						
958	21								
		G	G11		Below 21.34 - angular, dark grey.		Dry	27/02/2014 15:05	
957	22								
956	23	G	G12				Dry	27/02/2014 15:10	
955	24								
		G	G13		Below 24.38 m - fine, angular to rounded, foliated, grey, flat and elongated.		Dry	27/02/2014 15:15	
954	25								
953	26	G	G14		Below 25.91 m - light grey, shape as above.		Dry	27/02/2014 15:20	
952	27								
					Below 27.43 m - long, flat, rounded.		Dry	27/02/2014 15:23	Powdery cuttings.
951	28								
950	29	G	G15		Below 28.96 m - angular, grey, average clast size 2 mm.		Dry	27/02/2014 15:25	Powdery cuttings.
949	30								

(Continued on next page)

DRILL HOLE # BGC14-010

Coordinates (m): 681730E - 5607414N
Ground Elevation (m): 979
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.89

Location: TSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 4.57

Start Date: 27 Feb 2014
Finish Date: 02 Mar 2014
Final Depth (m): 78.33
Depth to Top of Rock (m): 10.97
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
948	30	G	G16		Below 30.48 m - drill cuttings described as soil: fine sand, uniformly graded, whitish grey, no dry strength, pulverized, powdery.		Dry	28/02/2014 10:51	Very dusty discharge.
947	31								
946	32				Below 32.00 m - fine, flat, elongated, dark to light grey, foliated, unweathered.		Dry	28/02/2014 10:54	
945	33	G	G17				Dry	28/02/2014 10:57	
944	34								
943	35				Below 35.05 m - average clast size is 2 mm.		Dry	28/02/2014 11:01	
942	36	G	G18				Dry	28/02/2014 11:05	
941	37								
940	38						Dry	28/02/2014 11:12	
939	39	G	G19				Dry	28/02/2014 11:18	
	40								

(Continued on next page)

DRILL HOLE # BGC14-010

Coordinates (m): 681730E - 5607414N
Ground Elevation (m): 979
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.89

Location: TSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 4.57

Start Date: 27 Feb 2014
Finish Date: 02 Mar 2014
Final Depth (m): 78.33
Depth to Top of Rock (m): 10.97
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
938	41				Below 41.45 m - average clast size 5 mm.		Dry	28/02/2014 11:21	
937	42					41.91			
936	43	G	G20				Dry	28/02/2014 11:30	
935	44					44.2	Dry	28/02/2014 11:36	
934	45								
933	46	G	G21			46.02	Dry	28/02/2014 11:40	
932	47							28/02/2014 11:45	At 46.63 m - moisture encountered. Unmeasurable amount of water. Driller described "break in dust".
931	48						Dry	28/02/2014 11:47	
930	49	G	G22				Dry	28/02/2014 11:54	
929	50								

(Continued on next page)

DRILL HOLE # BGC14-010

Coordinates (m): 681730E - 5607414N
Ground Elevation (m): 979
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.89

Location: TSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 4.57

Start Date: 27 Feb 2014
Finish Date: 02 Mar 2014
Final Depth (m): 78.33
Depth to Top of Rock (m): 10.97
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
928	50						Dry	28/02/2014 12:00	
	51								
927	52	G	G23		Below 51.82 m - angular, elongated, flat, dark grey.		Dry	28/02/2014 12:08	
926	53								
							Dry	28/02/2014 12:16	
925	54								
924	55	G	G24				Dry	28/02/2014 12:20	
923	56								
							Dry	28/02/2014 12:25	
922	57								
921	58	G	G25		Below 57.91 m - rounded to subangular, light greyish white, average clast size is 2 mm.		Dry	28/02/2014 12:30	
						58.22			
920	59								
							Dry	28/02/2014 12:37	
919	60					59.74			

(Continued on next page)

DRILL HOLE # BGC14-010

Coordinates (m): 681730E - 5607414N
Ground Elevation (m): 979
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.89

Location: TSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 4.57

Start Date: 27 Feb 2014
Finish Date: 02 Mar 2014
Final Depth (m): 78.33
Depth to Top of Rock (m): 10.97
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
918	61	G	G26				Dry	28/02/2014 12:42	
917	62								
916	63				Below 62.48 m - subangular, light grey, average clast size is 4 mm.		Dry	28/02/2014 12:47	
915	64	G	G27		Below 64.00 m - angular to subangular, dark grey, average clast size is 5 mm.		Dry	28/02/2014 12:52	
914	65								
913	66						Dry	28/02/2014 12:55	
912	67	G	G28		Below 67.06 m - average clast size is 3 mm.		Dry	28/02/2014 13:01	
911	68								
910	69				Below 68.58 m - angular.		Dry	28/02/2014 13:04	
909	70								

(Continued on next page)

DRILL HOLE # BGC14-010

Coordinates (m): 681730E - 5607414N
Ground Elevation (m): 979
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.89

Location: TSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 4.57

Start Date: 27 Feb 2014
Finish Date: 02 Mar 2014
Final Depth (m): 78.33
Depth to Top of Rock (m): 10.97
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
	70	G	G29				Dry	28/02/2014 13:08	
908	71								
907	72						Dry	28/02/2014 13:12	
906	73	G	G30				Dry	28/02/2014 13:15	
905	74								
904	75				Below 74.68 m - equant, subrounded clasts.		Dry	28/02/2014 13:18	
903	76	G	G31		Below 76.20 m - rounded, average clast size is 4 mm.		Dry	28/02/2014 13:25	
902	77								
901	78	G	G32				Dry	28/02/2014 13:32	
900	79				END OF HOLE AT 78.33 m NOTES: 1. 2" PVC standpipe piezometer installed with screen from 46.02 to 58.22 metres. 2. Filter sand placed from 44.20 to 59.74 metres. 3. Bentonite seal placed from 41.91 to 44.20 metres. 4. Hole backfilled from 59.74 m to 78.33 m with bentonite chips.		Dry	28/02/2014 13:37	
899	80								

DRILL HOLE # BGC14-011D

Coordinates (m): 682796E - 5605945N
Ground Elevation (m): 1,029
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.88

Location: TSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 5.18

Start Date: 01 Mar 2014
Finish Date: 02 Mar 2014
Final Depth (m): 29.56
Depth to Top of Rock (m): 5.49
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
1029	0				SAND (SW) Fine, some fine to coarse gravel, some silt, well graded, light brown with grey clasts. [TOPSOIL/FILL]	0	Dry	01/03/2014 10:03	
1028	1	G	G1				Dry	01/03/2014 10:05	
1027	2								
	3	G	G2		SILT (ML) Sandy, trace to some gravel, sand is fine, gravel is fine to coarse, well graded, low plasticity, brown with brown and grey clasts. [TILL]		Moist	01/03/2014 10:08	
1026									
1025	4								
	5	G	G3		Below 4.57 m - trace clay.		Moist	01/03/2014 10:11	Welding time 10:12 to 10:38.
1024									
	6				WEATHERED BEDROCK Drill cuttings: sandy, some gravel, sand is fine, gravel is fine, uniformly graded, light green, highly weathered. [NICOLA VOLCANICS]		Dry	01/03/2014 10:42	Cutting casing, changing drill bit 10:43 to 10:59.
1023									
1022	7								
	8	G	G4				Dry	01/03/2014 11:03	
1021						▼			
	9								At 8.62 m - static water level, measured 3/16/2014 12:35.
1020		G	G5				Dry	01/03/2014 11:06	
	10				From 9.75 m to 10.36 m - sandy, silty, green.		Moist	01/03/2014 11:10	Possible fault.

(Continued on next page)

DRILL HOLE # BGC14-011D

Coordinates (m): 682796E - 5605945N
Ground Elevation (m): 1,029
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.88

Location: TSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 5.18

Start Date: 01 Mar 2014
Finish Date: 02 Mar 2014
Final Depth (m): 29.56
Depth to Top of Rock (m): 5.49
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
1019	10								
		G	G6		BEDROCK Drill cuttings: fine grained, angular, dark grey, fresh and unweathered to slightly weathered.		Dry to moist	01/03/2014 11:14	
1018	11								
1017	12	G	G7		Below 12.19 m - angular to subrounded, average clast size is 6 mm.		Dry	01/03/2014 11:33	
1016	13								
					Below 13.72 m - average clast size is 3 mm.		Dry	01/03/2014 11:33	Hard drilling.
1015	14								
1014	15	G	G8		Below 15.24 m - rounded to subangular.		Dry	01/03/2014 11:37	
						▽	Moist		At 15.85 m - moisture encountered.
1013	16								
					Below 16.76 m - subrounded to angular, dark greenish grey.		Wet	01/03/2014 11:44	AIRLIFT #1 1.9 US GPM 1.7 US GPM 2.0 US GPM Average 1.9 US GPM
1012	17								
1011	18								
					Below 18.29 m - subangular to subrounded.		Wet	01/03/2014 11:55	
1010	19								
	20	G			WEATHERED BEDROCK	19.81	Moist	01/03/2014 12:09	

(Continued on next page)

DRILL HOLE # BGC14-011D

Coordinates (m): 682796E - 5605945N
Ground Elevation (m): 1,029
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.88

Location: TSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 5.18

Start Date: 01 Mar 2014
Finish Date: 02 Mar 2014
Final Depth (m): 29.56
Depth to Top of Rock (m): 5.49
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
1009	20	G	G9		Drill cuttings: sandy, sand is fine, uniformly graded, dark green, highly weathered.				
1008	21								
		G	G10				Moist	01/03/2014 12:21	
1007	22								
						22.56			
	23						Moist	01/03/2014 12:26	
1006						23.47			
1005	24								
		G	G11		Below 24.38 m - trace gravel, subangular.		Moist	01/03/2014 12:31	
1004	25								
1003	26						Moist	01/03/2014 12:38	
1002	27								
		G	G12				Moist	01/03/2014 12:45	
1001	28								
1000	29						Moist	01/03/2014 12:52	AIRLIFT #2 1.5 US GPM 2 US GPM 1.8 US GPM Average 1.8 US GPM
	30				END OF HOLE AT 29.56 m				

(Continued on next page)

DRILL HOLE # BGC14-011D

Coordinates (m): 682796E - 5605945N
Ground Elevation (m): 1,029
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.88

Location: TSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 5.18

Start Date: 01 Mar 2014
Finish Date: 02 Mar 2014
Final Depth (m): 29.56
Depth to Top of Rock (m): 5.49
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
999	30				NOTES: 1. 2" PVC standpipe piezometer installed with screen from 23.47 to 29.56 metres. 2. Filter sand placed from 22.56 to 29.56 metres. 3. Bentonite seal placed from 19.81 to 22.56 metres.				
998	31								
997	32								
996	33								
995	34								
994	35								
993	36								
992	37								
991	38								
990	39								
	40								

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Client: KGHM Ajax Mining Inc.
Print Date: 5/28/2015

DRILL HOLE # BGC14-011S

Coordinates (m): 682796E - 5605945N
Ground Elevation (m): 1,029
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.91

Location: TSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 5.18

Start Date: 01 Mar 2014
Finish Date: 02 Mar 2014
Final Depth (m): 18.29
Depth to Top of Rock (m): 5.49
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
1029	0				SAND (SW) Fine, some fine to coarse gravel, some silt, well graded, light brown with grey clasts. [TOPSOIL/FILL]	0	Dry	01/03/2014 15:03	
1028	1						Dry	01/03/2014 15:06	
1027	2								
	3								
1026					SILT (ML) Some sand to sandy, trace to some gravel, sand is fine, gravel is fine to coarse, well graded, low plasticity, light brown to brown with grey and brown clasts. [TILL]		Moist	01/03/2014 15:09	
1025	4								
					Below 4.57 m - trace clay.		Moist	01/03/2014 15:12	Welding time 15:13 to 15:30.
1024	5								
					BEDROCK Drill cuttings: fine grained, angular, dark grey, average clast size is 3 mm, fresh and unweathered to slightly weathered. [NICOLA VOLCANICS]				At 5.65 m - static water level, measured 3/14/2014 9:28. Cutting casing 15:35 PM to 15:43.
1023	6						Dry	01/03/2014 15:46	
1022	7								
							Dry	01/03/2014 15:54	
1021	8								
	9								
1020					Below 9.14 m - subrounded, light grey.		Dry	01/03/2014 16:00	
	10								

(Continued on next page)

DRILL HOLE # BGC14-011S

Coordinates (m): 682796E - 5605945N
Ground Elevation (m): 1,029
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.91

Location: TSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 5.18

Start Date: 01 Mar 2014
Finish Date: 02 Mar 2014
Final Depth (m): 18.29
Depth to Top of Rock (m): 5.49
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
1019	10				Below 10.67 m - subangular to subrounded, average particle size is 4 mm.		Dry	01/03/2014 16:08	
1018	11								
1017	12					12.5	Dry	01/03/2014 16:11	
1016	13								
1015	14				Below 13.72 m - clasts are flat and angular, average clast size is 3 mm.			01/03/2014 16:14	
						14.33	Moist	01/03/2014 16:16	
1014	15				WEATHERED BEDROCK Drill cuttings: sand , trace gravel, sand is fine, gravel is fine to coarse, uniformly graded, dark green. [NICOLA VOLCANICS]				
						15.27			
1013	16								At 15.85 m - water encountered.
1012	17						Moist	01/03/2014 16:18	AIRLIFT #1 1.5 US GPM 1 US GPM 1 US GPM Average 1.2 US GPM
1011	18								
1010	19				END OF HOLE AT 18.29 m NOTES: 1. 2" PVC standpipe piezometer installed with screen from 15.24 to 18.29 metres. 2. Filter sand placed from 14.33 to 18.29 metres. 3. Bentonite seal placed from 12.50 to 14.33 metres.		Moist	01/03/2014 16:20	
	20								

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Print Date: 5/28/2015

AJAX (HYDROGEO) AJAX_SOIL_HYDROGEO.GDL BGC.GDT 5/28/15

DRILL HOLE # BGC14-012D

Coordinates (m): 681950E - 5608373N
Ground Elevation (m): 924
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.91

Location: TSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 5.18

Start Date: 02 Mar 2014
Finish Date: 03 Mar 2014
Final Depth (m): 29.56
Depth to Top of Rock (m): 5.18
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
923	0				SAND (SW) Coarse, silty, gravelly, gravel is fine to coarse, well graded, angular to subrounded, dark brown with multilithic clasts. [TOPSOIL]	0	Dry	02/03/2014 14:41	
	1	G	G1				Moist	02/03/2014 14:44	At 1.34 m - static water level, measured 3/17/2014 10:58.
922	2								
921	3	G	G2		GRAVEL AND SAND (GP/SP) Gravel is fine to coarse, sand is coarse, uniformly graded, angular, dark brown, multilithic. [GLACIOFLUVIAL]		Wet	02/03/2014 14:45	At 2.13 m - water encountered.
920	4				SILT (ML) Sandy, trace gravel, trace clay, sand is fine, gravel is fine, uniformly graded, low plasticity, very dark grey. [TILL]		Wet	02/03/2014 14:46	
919	5	G	G3				Moist	02/03/2014 14:47	Welding time 14:48 to 15:10.
918	6	G	G4		BEDROCK Drill cuttings: fine grained, angular to subangular, dark grey, average clast size is 3 mm, fresh and unweathered to slightly weathered. [NICOLA VOLCANICS]		Dry	02/03/2014 15:13	Hard drilling.
917	7								
916	8	G	G5		Below 7.62 m - average clast size is 5 mm.		Dry	02/03/2014 15:25	
915	9	G	G6		Below 9.14 m - average clast size is 4 mm. From 9.44 m to 10.36 m - fine sand and fine gravel, sand is uniformly graded, gravel is rounded.		Dry	02/03/2014 15:32	
914	10								

(Continued on next page)

DRILL HOLE # BGC14-012D

Coordinates (m): 681950E - 5608373N
Ground Elevation (m): 924
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.91

Location: TSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 5.18

Start Date: 02 Mar 2014
Finish Date: 03 Mar 2014
Final Depth (m): 29.56
Depth to Top of Rock (m): 5.18
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
	10						Dry	02/03/2014 15:35	Soft drilling.
913	11				Below 10.67 m - angular clasts.		Dry	02/03/2014 15:37	
912	12	G	G7		Below 12.19 m - light grey, average clast size is 3 mm.		Dry	02/03/2014 15:47	
911	13								
910	14						Dry	02/03/2014 15:53	
909	15	G	G8		Below 15.24 m - greenish grey fine sand present in cuttings, gravel clasts as above.		Dry	02/03/2014 16:00	
908	16								
907	17					16.76	Dry	02/03/2014 16:04	
906	18	G	G9		Below 18.29 m - green sand no longer present in cuttings.		Dry	02/03/2014 16:08	
905	19					19.2			
904	20				Below 19.81 m - average clast size is 4 mm.		Dry	02/03/2014 16:16	

(Continued on next page)

DRILL HOLE # BGC14-012D

Coordinates (m): 681950E - 5608373N
Ground Elevation (m): 924
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.91

Location: TSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 5.18

Start Date: 02 Mar 2014
Finish Date: 03 Mar 2014
Final Depth (m): 29.56
Depth to Top of Rock (m): 5.18
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
	20								
903	21					20.42			
		G	G10				Moist	02/03/2014 16:20	At 21.34 m - water encountered.
902	22				From 22.25 m to 25.91 m - fine sand, gravelly, rounded cuttings, dark reddish brown, highly weathered, oxidized.		Moist	02/03/2014 16:23	Possible fault. Soft drilling.
901	23	G	G11				Moist	02/03/2014 16:25	
900	24								
		G	G12		Below 24.38 m - dark purplish red.		Moist	02/03/2014 16:27	
899	25					24.99			
898	26	G	G13		Below 25.91 m - angular, grey, end of weathered zone.		Moist	02/03/2014 16:29	
						26.21			
897	27								
		G	G14		Below 27.43 m - angular, uniformly graded, dark grey.		Moist	02/03/2014 16:40	
896	28								
895	29	G	G15		Below 28.96 m - subrounded, moderately weathered.		Moist	02/03/2014 16:45	
					At 29.26 m - increase in moisture content.		Wet	02/03/2014 16:50	
894	30				END OF HOLE AT 29.56 m			02/03/2014 16:50	AIRLIFT #1 1 US GPM 0.8 US GPM

(Continued on next page)

Project No.: 1125-007

Project: Ajax Project Environmental Assessment

DRILL HOLE # BGC14-012D

Location: Ajax Project Site

Coordinates (m): 681950E - 5608373N
Ground Elevation (m): 924
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.91

Location: TSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 5.18

Start Date: 02 Mar 2014
Finish Date: 03 Mar 2014
Final Depth (m): 29.56
Depth to Top of Rock (m): 5.18
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
	30				NOTES: 1. 2" PVC standpipe piezometer installed with screen from 20.42 to 24.99 metres. 2. Filter sand placed from 19.20 to 26.21 metres. 3. Bentonite seal placed from 16.76 to 19.20 metres. 4. Hole backfilled from 26.21 m to 29.56 with bentonite chips.				1 US GPM Average 1 US GPM
893	31								
892	32								
891	33								
890	34								
889	35								
888	36								
887	37								
886	38								
885	39								
884	40								

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Print Date: 5/28/2015

AJAX (HYDROGEO) AJAX_SOIL_HYDROGEO.GDL BGC.GDT 5/28/15

DRILL HOLE # BGC14-012S

Project No.: 1125-007
Project: Ajax Project Environmental Assessment
Location: Ajax Project Site

Coordinates (m): 681950E - 5608373N
Ground Elevation (m): 924
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.89

Location: TSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 0.91

Start Date: 03 Mar 2014
Finish Date: 03 Mar 2014
Final Depth (m): 3.35
Depth to Top of Rock (m): N/A
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
924	0				SAND (SW) Coarse, silty, gravelly, gravel is fine to coarse, well graded, angular to subrounded, dark brown with multilithic clasts. [TILL]	0	Dry	03/03/2014 10:22	
923	1						Dry	03/03/2014 10:23	At 1.44 m - static water level, measured 3/17/2014 8:55.
922	2					1.83			
					GRAVEL AND SAND (GP/SP) Gravel is fine to coarse, sand is coarse, uniformly graded, angular, dark brown, mulitlithic. [GLACIOFLUVIAL]	2.13			At 2.13 m - water encountered.
921	3					2.74			
920	4				END OF HOLE AT 3.35 m NOTES: 1. 2" PVC standpipe piezometer installed with screen from 2.74 to 3.35 metres. 2. Filter sand placed from 2.13 to 3.35 metres. 3. Bentonite seal placed from 1.83 to 2.13 metres.		Wet	03/03/2014 10:25	
919	5								
918	6								
917	7								
916	8								
915	9								
914	10								

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Client: KGHM Ajax Mining Inc.
Print Date: 5/28/2015

AJAX (HYDROGEO) AJAX_SOIL_HYDROGEO.GDL BGC.GDT 5/28/15

DRILL HOLE # BGC14-013

Coordinates (m): 686466E - 5606777N
Ground Elevation (m): 987
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.75

Location: SMRSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 5.18

Start Date: 03 Mar 2014
Finish Date: 04 Mar 2014
Final Depth (m): 30.48
Depth to Top of Rock (m): 11.28
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
986	0				SILT (ML) Sandy, some clay, trace fine gravel, sand is fine, well graded, low plasticity, light greyish brown. [TILL]	0	Moist	03/03/2014 15:51	Soapy feeling.
	1								
985	2	G	G1				Moist	03/03/2014 15:52	
					SAND AND SILT (SM) Sand is fine, trace clay, uniformly graded, low plasticity, brown. [TILL]				
984	3	G	G2				Moist	03/03/2014 15:34	At 3.16 m - static water level, measured 3/18/2014 8:48.
983	4								
		G	G3		Below 4.57 m - trace to some clay.		Moist	03/03/2014 15:56	Welding time 15:57 to 16:18.
982	5								
981	6						Moist	03/03/2014 16:20	
980	7								
		G	G4		Below 7.62 m - slight increase in silt content.		Moist	03/03/2014 16:25	
979	8								
978	9								
		G	G5		Below 9.14 m - increase in silt content.		Moist	03/03/2014 16:28	
977	10				GRAVEL (GP)				At 9.75 m - water

(Continued on next page)

DRILL HOLE # BGC14-013

Coordinates (m): 686466E - 5606777N
Ground Elevation (m): 987
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.75

Location: SMRSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 5.18

Start Date: 03 Mar 2014
Finish Date: 04 Mar 2014
Final Depth (m): 30.48
Depth to Top of Rock (m): 11.28
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
	10				Fine to coarse, sandy, trace clay, sand is coarse, uniformly graded, subangular to subrounded, multilithic. [GLACIOFLUVIAL]				encountered at start of unit.
976	11	G	G6				Wet	03/03/2014 16:30	AIRLIFT #1 1.5 US GPM 1.3 US GPM 1.3 US GPM Average 1.4 US GPM
					BEDROCK Drill cuttings: fine to coarse grained, uniformly graded, angular, multilithic, moderately weathered, oxidized.		Wet	03/03/2014 16:31	Changing drill bit 16:31 to 16:50.
975	12	G	G7				Wet, dark grey	03/03/2014 16:55	
974	13								
973	14				Below 13.72 m - angular, dark grey, slightly weathered, faintly oxidized.		Wet, dark grey	03/03/2014 16:57	
972	15	G	G8				Wet, dark grey	03/03/2014 17:01	
971	16								
970	17						Wet, light grey	03/03/2014 17:07	
969	18	G	G9		Below 18.29 m - subangular, dark grey to light grey, average particle size is 4 mm.		Wet, light grey to clear	04/03/2014 07:18	AIRLIFT #2 2.9 US GPM 2.8 US GPM 2.7 US GPM Average 2.8 US GPM
968	19								
967	20				Below 19.81 m - uniformly graded, angular to subangular, dark bluish grey, average		Wet, clean to light	04/03/2014 07:25	

(Continued on next page)

DRILL HOLE # BGC14-013

Coordinates (m): 686466E - 5606777N
Ground Elevation (m): 987
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.75

Location: SMRSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 5.18

Start Date: 03 Mar 2014
Finish Date: 04 Mar 2014
Final Depth (m): 30.48
Depth to Top of Rock (m): 11.28
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
	20				particle size is 2 mm.		grey		
966	21								
		G	G10				Wet, silty	04/03/2014 07:29	From 21.64 to 22.56 m - softer drilling, silty discharge water.
965	22								
964	23	G	G11		Below 22.86 m - trace silt, average clast size is 5 mm.		Wet, silty	04/03/2014 07:33	
								04/03/2014 07:33	AIRLIFT #3 2.5 US GPM 2.5 US GPM 2.4 US GPM Average 2.5 US GPM
963	24					24.08			
		G	G12		Below 24.38 m - angular, flat, grey, average clast size is 4 mm.		Wet, clean to light grey	04/03/2014 07:46	
962	25								
961	26				Below 25.91 m - average clast size is 2 mm.		Wet, clean to light grey	04/03/2014 07:50	
						26.52			
960	27								
		G	G13			27.43	Wet, clean to light grey	04/03/2014 07:55	
959	28	G	G14						
958	29	G	G15		From 28.04 m to 28.65 m - yellowish brown, clayey, silty discharge, cuttings are angular, dark grey and brown. At 28.91 m - angular, dark grey, as above.		Wet, yellowish brown	04/03/2014 07:56	
		G	G16				Wet, yellowish brown	04/03/2014 08:03	
957	30								

(Continued on next page)

DRILL HOLE # BGC14-013

Coordinates (m): 686466E - 5606777N
Ground Elevation (m): 987
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.75

Location: SMRSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 5.18

Start Date: 03 Mar 2014
Finish Date: 04 Mar 2014
Final Depth (m): 30.48
Depth to Top of Rock (m): 11.28
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
	30	G	G17		From 29.56 m to 29.87 m - silty, yellowish brown, multilithic cuttings. Below 29.87 m - fine, angular, dark grey.				
956	31				END OF HOLE AT 30.48 m NOTES: 1. 2" PVC standpipe piezometer installed with screen from 27.43 to 30.48 metres. 2. Filter sand placed from 26.52 to 30.48 metres. 3. Bentonite seal placed from 24.08 to 26.52 metres.		Wet, clean to light grey	04/03/2014 08:09	AIRLIFT #4 2.6 US GPM 2.7 US GPM 2.7 US GPM Average 2.7 US GPM
955	32								
954	33								
953	34								
952	35								
951	36								
950	37								
949	38								
948	39								
947	40								

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AN APPLIED EARTH SCIENCES COMPANY

Client: KGHM Ajax Mining Inc.
Print Date: 5/28/2015

DRILL HOLE # BGC14-014D

Coordinates (m): 686672E - 5607810N
Ground Elevation (m): 986
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.89

Location: SMRSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 5.18

Start Date: 04 Mar 2014
Finish Date: 05 Mar 2014
Final Depth (m): 29.56
Depth to Top of Rock (m): 18.90
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
985	0				SAND (SW) Fine, silty, gravelly, gravel is fine to coarse, well graded, dark brown with grey clasts. [TOPSOIL/FILL]	0	Moist	04/03/2014 14:00	Moist from snow.
984	1								
	2	G	G1		GRAVEL (GP) Fine to coarse, sandy, sand is coarse, uniformly graded, angular to subrounded, brown and grey. [GLACIOFLUVIAL]		Dry	04/03/2014 14:02	
983	3	G	G2		SAND [SM] Fine, silty, some gravel, gravel is fine to coarse, light brown with grey clasts. [TILL]		Dry to moist	04/03/2014 14:04	
982	4								
981	5						Dry to moist	04/03/2014 14:07	Welding time 14:08 PM to 14:32.
980	6								
979	7				SILT [ML] Sandy, trace to some gravel, sand is fine, uniformly graded, low plasticity, grey with grey and brown clasts. [TILL]		Dry to moist	04/03/2014 14:37	
978	8	G	G3		Below 7.62 m - gravel is angular to subrounded, grey.		Dry to moist	04/03/2014 14:40	
977	9								
976	10						Dry to moist	04/03/2014 14:43	

(Continued on next page)

DRILL HOLE # BGC14-014D

Coordinates (m): 686672E - 5607810N
Ground Elevation (m): 986
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.89

Location: SMRSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 5.18

Start Date: 04 Mar 2014
Finish Date: 05 Mar 2014
Final Depth (m): 29.56
Depth to Top of Rock (m): 18.90
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
975	10	G	G4		Below 10.67 m - trace clay, light brownish grey.		Dry to moist	04/03/2014 14:46	Welding time 14:48 to 15:04.
974	11								
	12						Dry to moist	04/03/2014 15:08	
973	13					▼			At 12.91 m - static water level, measured 5/28/2014 8:15.
972	14	G	G5		Below 13.72 m - trace gravel, multilithic.		Dry to moist	04/03/2014 15:09	
971	15								
					Below 15.24 m - decrease in gravel content.		Dry to moist	04/03/2014 15:14	
970	16								
969	17	G	G6				Dry to moist	04/03/2014 15:16	Welding time 15:17 to 15:35.
968	18								
							Dry to moist	04/03/2014 15:39	
967	19				BEDROCK Drill cuttings: sand and gravel, sand is medium to coarse, gravel is coarse, sand is rounded, gravel is angular to subrounded, brownish grey, mulitlithic, moderately weathered.				
966	20	G					Dry	04/03/2014 15:42	Changing drill bit

(Continued on next page)

DRILL HOLE # BGC14-014D

Coordinates (m): 686672E - 5607810N
Ground Elevation (m): 986
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.89

Location: SMRSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 5.18

Start Date: 04 Mar 2014
Finish Date: 05 Mar 2014
Final Depth (m): 29.56
Depth to Top of Rock (m): 18.90
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
	20	G	G7						15:43 to 16:00.
965						20.57			
	21								
964		G	G8		Below 21.34 m - rounded clasts, light greenish grey, fine sand present in cuttings, moderately weathered.		Dry	04/03/2014 16:05	
	22								
963						22.56			
	23	G	G9		Below 22.86 m - gravelly sand, sand is fine, light greyish green, gravel is rounded, moderately weathered.		Dry	04/03/2014 16:09	
962						23.47			
	24								
961		G	G10		Below 24.38 m - sandy gravel, gravel is dark grey, angular to subrounded, sand is coarse, grey, moderately weathered. ▽		Dry	04/03/2014 16:17	
	25							04/03/2014 16:17	At 24.69 m - moisture encountered, driller described "break in dust".
960								04/03/2014 16:17	At 25.30 m - moisture encountered, driller described "break in dust".
	26	G	G11		Below 25.91 m - fine sand, light greenish grey, uniform, trace gravel, gravel is dark grey, angular, moderately weathered.		Dry	04/03/2014 16:21	
959									
	27								
958		G	G12		Below 27.43 m - gravel, fine to coarse, some sand (fine), gravel is grey, subrounded, sand is greenish grey, moderately weathered.		Dry	04/03/2014 16:28	
	28								
957									
	29	G	G13						
956					END OF HOLE AT 29.56 m				
	30								

(Continued on next page)

Project No.: 1125-007

Project: Ajax Project Environmental Assessment

DRILL HOLE # BGC14-014D

Location: Ajax Project Site

Coordinates (m): 686672E - 5607810N
Ground Elevation (m): 986
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.89

Location: SMRSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 5.18

Start Date: 04 Mar 2014
Finish Date: 05 Mar 2014
Final Depth (m): 29.56
Depth to Top of Rock (m): 18.90
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
955	30				NOTES: 1. 2" PVC standpipe piezometer installed with screen from 23.47 to 29.56 metres. 2. Filter sand placed from 22.56 to 29.56 metres. 3. Bentonite seal placed from 20.57 to 22.56 metres.				
954	31								
953	32								
952	33								
951	34								
950	35								
949	36								
948	37								
947	38								
946	39								
	40								

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Client: KGHM Ajax Mining Inc.

Print Date: 5/28/2015

AJAX (HYDROGEO) AJAX_SOIL_HYDROGEO.GDL BGC.GDT 5/28/15

DRILL HOLE # BGC14-014S

Coordinates (m): 686672E - 5607810N
Ground Elevation (m): 986
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.89

Location: SMRSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 5.18

Start Date: 05 Mar 2014
Finish Date: 05 Mar 2014
Final Depth (m): 18.90
Depth to Top of Rock (m): N/A
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
985	0				SAND (SW) Fine to coarse, gravelly, silty, well graded, dark brown with grey clasts. [TOPSOIL]	0	Moist from snow melt	05/03/2014 11:28	
984	1				GRAVEL (GW) Fine to coarse, silty, some fine to coarse sand, well graded, angular to subrounded, greyish brown. [GLACIOFLUVIAL]		Dry	05/03/2014 11:31	
983	2								
982	3				SILT (ML) Some fine sand, trace to some gravel, low plasticity, uniformly graded, brown with grey clasts, clasts are angular. [TILL]		Dry	05/03/2014 11:35	
981	4								
980	5				Below 4.57 m - sandy, fine.		Dry to moist	05/03/2014 11:39	Welding time 11:40 to 12:04.
979	6				Below 6.10 m - decrease in gravel, light greyish brown with grey and brown clasts.		Dry to moist	05/03/2014 12:06	
978	7								
977	8						Dry to moist	05/03/2014 12:10	
976	9						Dry to moist	05/03/2014 12:13	
	10					9.75			

(Continued on next page)

DRILL HOLE # BGC14-014S

Coordinates (m): 686672E - 5607810N
Ground Elevation (m): 986
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.89

Location: SMRSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 5.18

Start Date: 05 Mar 2014
Finish Date: 05 Mar 2014
Final Depth (m): 18.90
Depth to Top of Rock (m): N/A
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
975	10				Below 10.67 m - trace clay.		Dry to moist	05/03/2014 12:15	Welding time 12:16 to 12:40.
974	11								
973	12					12.19	Dry to moist	05/03/2014 12:42	
972	13					12.8			
971	14						Dry to moist	05/03/2014 12:46	
970	15				Below 15.24 m - increase in gravel content, angular to subrounded.		Dry to moist	05/03/2014 12:50	
969	16								
968	17				Below 16.76 m - decrease in gravel content.		Dry to moist	05/03/2014 12:59	Welding time 13:00 to 13:20.
967	18				Below 18.29 m - gravel is angular.		Dry to moist	05/03/2014 13:22	
966	19				END OF HOLE AT 18.90 m NOTES: 1. 2" PVC standpipe peizometer installed with screen from 12.80 to 18.90 metres. 2. Filter sand placed from 12.19 to 18.90 metres. 3. Bentonite seal placed from 9.75 to 12.19 metres.				
	20								

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: KGHM Ajax Mining Inc.
Print Date: 5/28/2015

DRILL HOLE # BGC14-015D

Coordinates (m): 686773E - 5606920N
Ground Elevation (m): 977
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.94

Location: SMRSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 5.18

Start Date: 06 Mar 2014
Finish Date: 06 Mar 2014
Final Depth (m): 29.56
Depth to Top of Rock (m): 11.28
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
976	0				SILT (ML) Sandy, some gravel, trace clay, sand is fine, gravel is fine, well graded, low plasticity, dark brown with grey clasts. [TILL]	0	Moist	06/03/2014 07:50	Drill bit plugged with soil 7:51 to 8:43.
	1								At 0.95 m - static water level, measured 5/7/2014 2:02.
975							Dry to moist	06/03/2014 08:45	
	2								
974									
	3	G	G1		Below 3.04 m - some fine sand, trace to some clay.		Dry to moist	06/03/2014 08:47	
973									
	4								
972		G	G2		SAND (SP) Fine, some fine gravel, trace silt, uniformly graded, brown with brown and grey clasts. [TILL]		Dry	06/03/2014 08:57	Welding time 8:58 to 9:20.
	5								
971									
	6	G	G3		Below 6.10 m - some silt, trace gravel, slight increase in moisture content.		Dry	06/03/2014 09:23	
970									
	7				At 7.01 m - boulder.			06/03/2014 09:25	Changing drill bit 9:25 to 9:33.
969		G	G4		Below 7.62 m - increase in silt, gravel no longer present.		Dry to moist	06/03/2014 00:00	
	8								
968					GRAVEL AND SAND (SP/GP) Gravel is fine to coarse, sand is medium to coarse, trace silt, uniformly graded, subrounded, dark grey. [GLACIOFLUVIAL]		Wet	06/03/2014 09:36	At 8.53 m - water encountered.
	9	G	G5		Below 9.14 m - trace to some silt, subangular to subrounded.		Wet	06/03/2014 09:40	
967									
	10								

(Continued on next page)

DRILL HOLE # BGC14-015D

Coordinates (m): 686773E - 5606920N
Ground Elevation (m): 977
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.94

Location: SMRSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 5.18

Start Date: 06 Mar 2014
Finish Date: 06 Mar 2014
Final Depth (m): 29.56
Depth to Top of Rock (m): 11.28
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
966	10				Below 10.67 - trace to some clay, driller described as cohesive drilling.		Wet	06/03/2014 09:47	Welding time and had to case through boulder 9:49 to 10:30. At 11.25 m - attempted to airlift, no water expelled.
965	11								
	12	G	G6		WEATHERED BEDROCK Drill cuttings: gravel and sand, gravel is coarse, sand is coarse, subangular, brownish grey, moderately to extremely weathered. [NICOLA VOLCANICS]		Wet	06/03/2014 10:30	
964	13								
963	14	G	G7		Below 13.72 m - fine sand, uniformly graded, brownish grey.			06/03/2014 10:45	
962	15				BEDROCK Drill cuttings: fine grained, angular, grey, fresh and unweathered. [NICOLA VOLCANICS]		Dry	06/03/2014 10:48	Hard drilling.
		G	G8				Dry	06/03/2014 10:50	Tripping out rods to switch drill bits 10:55 to 11:08.
961	16								
960	17				Below 16.76 m - average particle size is 4 mm.		Dry	06/03/2014 11:10	Welding time 11:15 to 11:40.
959	18								
		G	G9		Below 18.29 m - average particle size is 5 mm.		Dry	06/03/2014 11:54	
958	19								
957	20						Dry	06/03/2014 11:55	

(Continued on next page)

DRILL HOLE # BGC14-015D

Coordinates (m): 686773E - 5606920N
Ground Elevation (m): 977
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.94

Location: SMRSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 5.18

Start Date: 06 Mar 2014
Finish Date: 06 Mar 2014
Final Depth (m): 29.56
Depth to Top of Rock (m): 11.28
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
	20					20.12			
956									
	21								
		G	G10				Dry	06/03/2014 11:56	
955									
	22					22.25			
954									
	23							06/03/2014 11:57	
953						23.47			
	24								
		G	G11		Below 24.38 m - average clast size is 3 mm.		Dry	06/03/2014 11:58	
952									
	25								
951									
	26				Below 25.91 m - average particle size is 2 - 3 mm.		Dry	06/03/2014 11:59	
950									
	27								
		G	G12		Below 27.43 m - fine sand present in cuttings, increase in weathering.		Dry	06/03/2014 12:00	
949									
	28								
948									
	29	G	G13		At 28.96 m - average particle size is 4 mm.		Dry	06/03/2014 12:02	Driller described "break in dust". From 29.26 m to 29.56 m - moisture detected, not enough for airlift.
947					END OF HOLE AT 29.56 m				
	30								

(Continued on next page)

Project No.: 1125-007

Project: Ajax Project Environmental Assessment

DRILL HOLE # BGC14-015D

Location: Ajax Project Site

Coordinates (m): 686773E - 5606920N
Ground Elevation (m): 977
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.94

Location: SMRSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 5.18

Start Date: 06 Mar 2014
Finish Date: 06 Mar 2014
Final Depth (m): 29.56
Depth to Top of Rock (m): 11.28
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
946	30				NOTES: 1. 2" PVC standpipe piezometer installed with screen from 23.47 to 29.56 metres. 2. Filter sand placed from 22.25 to 29.56 metres. 3. Bentonite seal placed from 20.17 to 22.25 metres.				
945	31								
944	32								
943	33								
942	34								
941	35								
940	36								
939	37								
938	38								
937	39								
	40								

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AN APPLIED EARTH SCIENCES COMPANY

Client: KGHM Ajax Mining Inc.

Print Date: 5/28/2015

AJAX (HYDROGEO) AJAX_SOIL_HYDROGEO.GDL BGC.GDT 5/28/15

Project No.: 1125-007

Project: Ajax Project Environmental Assessment

DRILL HOLE # BGC14-015S

Location: Ajax Project Site

Coordinates (m): 686773E - 5606920N
Ground Elevation (m): 977
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.89

Location: SMRSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 2.13

Start Date: 06 Mar 2014
Finish Date: 06 Mar 2014
Final Depth (m): 11.28
Depth to Top of Rock (m): N/A
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
977	0				SILT (ML) Sandy, trace gravel, trace clay, sand is fine, well graded, low plasticity, brown with grey and brown clasts. [TILL]	0	Moist	06/03/2014 15:10	
976	1								At 0.88 m - static water level, measured 5/28/2014 10:27.
975	2						Dry to moist	06/03/2014 15:13	
974	3				Below 3.04 m - some sand increase in clay.		Dry to moist	06/03/2014 15:16	
973	4								
972	5				SAND (SW) Fine, gravelly, silty, gravel is fine to coarse, well graded, angular, dark grey with grey clasts. [TILL]		Dry	06/03/2014 15:19	Welding time 15:20 to 15:46.
971	6					5.49	Dry	06/03/2014 15:51	
970	7				Below 6.10 m - decrease in silt content.				
969	8				Below 7.62 m - increase in silt content, dark greyish brown.	7.62	Dry	06/03/2014 15:54	
968	9					8.23			
967	10				SAND (SP) Fine, trace silt, some gravel to gravelly, gravel is fine, uniformly graded, greyish brown. [GLACIOFLUVIAL]			06/03/2014 15:55	At 9.14 m - moisture encountered.

(Continued on next page)

BGC ENGINEERING INC.
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Client: KGHM Ajax Mining Inc.

Print Date: 5/28/2015

AJAX (HYDROGEO) AJAX_SOIL_HYDROGEO.GDL BGC.GDT 5/28/15

DRILL HOLE # BGC14-015S

Coordinates (m): 686773E - 5606920N
Ground Elevation (m): 977
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.89

Location: SMRSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 2.13

Start Date: 06 Mar 2014
Finish Date: 06 Mar 2014
Final Depth (m): 11.28
Depth to Top of Rock (m): N/A
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
966	10–11				Below 10.67 m - gravelly, fine to coarse.		Moist	06/03/2014 15:58	
965	12				END OF HOLE AT 11.28 m NOTES: 1. 2" PVC standpipe piezometer installed with screen from 8.23 to 11.28 metres. 2. Filter sand placed from 7.62 to 11.28 metres. 3. Bentonite seal placed from 5.49 to 7.62 metres.				
964	13								
963	14								
962	15								
961	16								
960	17								
959	18								
958	19								
957	20								

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: KGHM Ajax Mining Inc.
Print Date: 5/28/2015

Project No.: 1125-007
Project: Ajax Project Environmental Assessment

DRILL HOLE # BGC14-016

Location: Ajax Project Site

Coordinates (m): 685348E - 5607041N
Ground Elevation (m): 1,039
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.89

Location: SMRSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 5.18

Start Date: 07 Mar 2014
Finish Date: 07 Mar 2014
Final Depth (m): 29.56
Depth to Top of Rock (m): 1.83
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
1038	0				SAND AND GRAVEL (SP/GP) Sand is fine, gravel is fine to coarse, gap graded, light brown with brown and grey clasts. [TOPSOIL]	0	Dry	07/03/2014 09:52	
	1	G	G1				Dry	07/03/2014 09:55	Cutting casing, switching drill bits 9:56 to 10:08.
1037	2				BEDROCK Drill cuttings: fine to medium grained, angular, light grey, slightly weathered, average clast size is 5 mm.				
1036	3	G	G2				Dry	07/03/2014 10:10	Hard drilling.
1035	4								
1034	5				Below 4.57 m - grey, average clast size is 4 mm, slight decrease in weathering grade.		Dry	07/03/2014 10:13	
1033	6								At 5.46 m - static water level, measured 3/21/2014 7:48.
		G	G3		Below 6.10 m - average clast size is 2 - 3 mm, fresh and unweathered.		Dry	07/03/2014 10:20	
1032	7								
1031	8				Below 7.62 m - darker grey.				
1030	9								
		G	G4		Below 9.14 m - average clast size is 3 mm.		Dry	07/03/2014 10:31	
1029	10								

(Continued on next page)

DRILL HOLE # BGC14-016

Coordinates (m): 685348E - 5607041N
Ground Elevation (m): 1,039
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.89

Location: SMRSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 5.18

Start Date: 07 Mar 2014
Finish Date: 07 Mar 2014
Final Depth (m): 29.56
Depth to Top of Rock (m): 1.83
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
1028	10						Dry	07/03/2014 10:37	
1027	11								
1026	12	G	G5		Below 12.19 m - subangular to angular, light grey to white, slightly weathered.				
1025	13						Dry	07/03/2014 10:47	Environmental inspection 10:48 to 11:09.
1024	14				Below 13.72 m - slightly darker grey.				
1023	15	G	G6		Below 15.24 m - angular to subrounded, grey, average clast size is 4 mm.		Dry	07/03/2014 11:13	
1022	16								
1021	17				Below 16.76 m - angular, dark grey.		Dry	07/03/2014 11:17	
1020	18	G	G7		Below 18.29 m - angular to subangular, grey, average clast size is 5 mm.		Dry	07/03/2014 11:26	
1019	19								
	20						Dry	07/03/2014 11:32	Very hard drilling.

(Continued on next page)

DRILL HOLE # BGC14-016

Coordinates (m): 685348E - 5607041N
Ground Elevation (m): 1,039
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.89

Location: SMRSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 5.18

Start Date: 07 Mar 2014
Finish Date: 07 Mar 2014
Final Depth (m): 29.56
Depth to Top of Rock (m): 1.83
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
	20					20.12			
1018	21	G	G8		Below 21.34 m - angular, average clast size is 2 - 3 mm.		Dry	07/03/2014 11:39	
1017	22					22.56			
1016	23						Dry	07/03/2014 11:44	
1015	24	G	G9			23.47	Dry	07/03/2014 11:49	
1014	25								
1013	26	G	G10		Below 25.91 m - subangular, whitish grey.		Dry	07/03/2014 11:56	
1012	27					▽		07/03/2014 11:57	At 26.82 m - water encountered.
1011	28	G	G11		Below 27.43 m - subrounded to subangular, dark grey, slightly weathered.		Wet	07/03/2014 12:03	Softer drilling.
1010	29	G	G12				Wet	07/03/2014 12:08	
1009	30				END OF HOLE AT 29.56 m			07/03/2014 12:08	AIRLIFT #1 0.2 US GPM (estimated from

(Continued on next page)

DRILL HOLE # BGC14-016

Coordinates (m): 685348E - 5607041N
Ground Elevation (m): 1,039
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.89

Location: SMRSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 5.18

Start Date: 07 Mar 2014
Finish Date: 07 Mar 2014
Final Depth (m): 29.56
Depth to Top of Rock (m): 1.83
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
	30				NOTES: 1. 2" PVC standpipe peizometer installed with screen from 23.47 to 29.56 metres. 2. Filter sand placed from 23.47 to 29.56 metres. 3. Bentonite seal placed from 20.12 to 22.56 metres.				buildup).
1008	31								
1007	32								
1006	33								
1005	34								
1004	35								
1003	36								
1002	37								
1001	38								
1000	39								
999	40								

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Client: KGHM Ajax Mining Inc.
Print Date: 5/28/2015

DRILL HOLE # BGC14-017D

Coordinates (m): 685540E - 5605928N
Ground Elevation (m): 1,040
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.91

Location: TSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 5.18

Start Date: 10 Mar 2014
Finish Date: 10 Mar 2014
Final Depth (m): 29.56
Depth to Top of Rock (m): 3.96
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
1040	0				SAND (SW) Fine, silty, some fine to coarse gravel, well graded, dark brown, trace organics (roots, 5 - 10 mm diameter). [TOPSOIL]	0	Moist	10/03/2014 10:41	Artesian, noted 5/13/2014 9:36:00.
1039	1								
	2	G	G1						
1038					SILT (ML) Sandy, trace to some fine to coarse gravel, trace clay, sand is fine, well graded, light brown, low plasticity, clasts are angular. [TILL]		Moist	10/03/2014 10:42	
	3								
1037		G	G2				Moist	10/03/2014 10:44	
	4				BEDROCK Drill cuttings: fine to medium grained, angular, grey, fresh and unweathered to slightly weathered.				
1036							Dry	10/03/2014 10:47	Changing drill bit 10:49 to 11:04.
	5								
1035									At 5.49 m - moisture encountered.
	6								
1034		G	G3		Below 6.10 m - fine, grey, slightly green, fresh and unweathered, average clast size is 7 mm.		Dry	10/03/2014 11:06	
	7								
1033									
	8				Below 7.62 m - bluish grey, average clast size is 4 mm.		Dry	10/03/2014 11:10	
1032									At 8.23 m - moisture encountered.
	9								
1031		G	G4				Dry	10/03/2014 11:14	
	10								

(Continued on next page)

DRILL HOLE # BGC14-017D

Coordinates (m): 685540E - 5605928N
Ground Elevation (m): 1,040
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.91

Location: TSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 5.18

Start Date: 10 Mar 2014
Finish Date: 10 Mar 2014
Final Depth (m): 29.56
Depth to Top of Rock (m): 3.96
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
1030	10								
					Below 10.67 m - angular to subangular, average clast size is 3 mm.		Dry	10/03/2014 11:17	
1029	11								At 10.97 m - moisure encountered.
	12								
1028		G	G5				Dry	10/03/2014 11:21	
1027	13								
	14	G	G6		Below 13.72 m - greenish grey sand present in cuttings, slightly weathered.		Dry	10/03/2014 11:25	
1026									
1025	15	G	G7		Below 15.24 m - average clast size is 2 mm, slightly weathered.		Dry	10/03/2014 11:29	
1024	16								
	17						Dry	10/03/2014 11:32	
1023									
1022	18	G	G8		At 18.29 m - lumps of clayey silt present in cuttings with slight oxidation, gravel cuttings are subrounded, slightly purplish red to grey, modereately weathered.		Dry to slightly moist	10/03/2014 11:36	
1021	19								
	20	G			Below 19.81 m - grey clasts with some greenish grey sand present, angular to		Dry	10/03/2014 11:39	

(Continued on next page)

DRILL HOLE # BGC14-017D

Coordinates (m): 685540E - 5605928N
Ground Elevation (m): 1,040
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.91

Location: TSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 5.18

Start Date: 10 Mar 2014
Finish Date: 10 Mar 2014
Final Depth (m): 29.56
Depth to Top of Rock (m): 3.96
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
1020	20	G	G9		subrounded.	20.12			
1019	21	G	G10		Below 21.34 m - purplish grey, mostly fine sand, moderately weathered.		Dry	10/03/2014 11:43	
1018	22					22.56			
1017	23	G	G11		Below 22.86 m - only some sand present, gravel cuttings are greyish green, angular, slightly weathered.		Dry	10/03/2014 11:48	
1016	24					23.47	Dry to slightly moist	10/03/2014 11:54	At 23.47 m - moisture encountered.
1015	25	G	G12						
1014	26	G	G13					10/03/2014 11:59	At 25.91 m - sand is dry to slightly moist.
1013	27								At 26.82 m - moisture encountered.
1012	28	G	G14		Below 27.43 m - moderately weathered, faint oxidation, moisture encountered.		Dry to slightly moist	10/03/2014 12:04	
1011	29	G	G15		Below 28.96 m - slightly weathered.		Dry	10/03/2014 12:09	AIRLIFT #1 0.2 US GPM
	30				END OF HOLE AT 29.56 m				

(Continued on next page)

Project No.: 1125-007

Project: Ajax Project Environmental Assessment

DRILL HOLE # BGC14-017D

Location: Ajax Project Site

Coordinates (m): 685540E - 5605928N
Ground Elevation (m): 1,040
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.91

Location: TSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 5.18

Start Date: 10 Mar 2014
Finish Date: 10 Mar 2014
Final Depth (m): 29.56
Depth to Top of Rock (m): 3.96
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
1010	30				NOTES: 1. 2" PVC standpipe piezometer installed with screen from 23.47 to 29.56 metres. 2. Filter sand placed from 22.56 to 29.56 metres. 3. Bentonite seal placed from 20.12 to 22.56 metres.				
1009	31								
1008	32								
1007	33								
1006	34								
1005	35								
1004	36								
1003	37								
1002	38								
1001	39								
	40								

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: KGHM Ajax Mining Inc.

Print Date: 5/28/2015

AJAX (HYDROGEO) AJAX_SOIL_HYDROGEO.GDL BGC.GDT 5/28/15

DRILL HOLE # BGC14-017S

Project No.: 1125-007

Project: Ajax Project Environmental Assessment

Location: Ajax Project Site

Coordinates (m): 685540E - 5605928N
Ground Elevation (m): 1,040
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.89

Location: TSF
Drilling Contractor: JR Drilling Central Ltd.
Drill Method: Dual Rotary
Diameter (m): 0.15
Fluid: Air
Cased To (m): 1.52

Start Date: 10 Mar 2014
Finish Date: 10 Mar 2014
Final Depth (m): 5.18
Depth to Top of Rock (m): 4.57
Logged By: SLP
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
1040	0				SAND (SW) Fine, silty, some fine to coarse gravel, well graded, dark brown, trace organics (rootlets). [TOPSOIL]	0	Moist	10/03/2014 13:42	
1039	1								At 0.9 m - static water level, measured 5/25/2014 3:40.
							Moist	10/03/2014 13:43	
1038	2								
						2.74			
1037	3				SILT (ML) Sandy, trace fine to coarse gravel, trace clay, well graded, low plasticity, light brown with brown and grey clasts, clasts are angular to subrounded. [TILL]	3.04	Moist	10/03/2014 13:44	
1036	4								
						4.57			
	5				BEDROCK Drill cuttings: fine to medium grained, angular, angular, fresh and unweathered to slightly weathered.		Dry	10/03/2014 13:45	
1035					END OF HOLE AT 5.18 m				
	6				NOTES: 1. 2" PVC standpipe peizometer installed with screen from 3.04 to 4.57 metres. 2. Filter sand placed from 2.74 to 5.18 metres. 3. Bentonite seal placed from 0.00 to 2.74 metres.				
1034									
	7								
1033									
	8								
1032									
	9								
1031									
	10								

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: KGHM Ajax Mining Inc.

Print Date: 5/28/2015

AJAX (HYDROGEO) AJAX_SOIL_HYDROGEO.GDL BGC.GDT 5/28/15

LEGEND FOR WELL LOGS

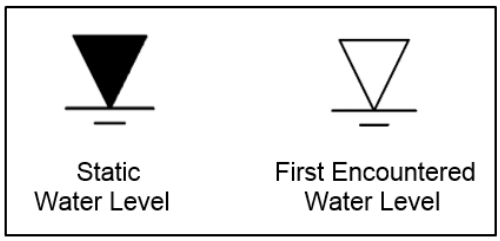
The various parameters depicted on the well logs are described below according to the select headings found on the form.

Depth

Depth below ground surface is measured in meters.

Water Levels

Groundwater levels are represented by the symbols shown below. First encountered water levels are obtained during drilling progress, static water levels are measured after drilling installation is complete.

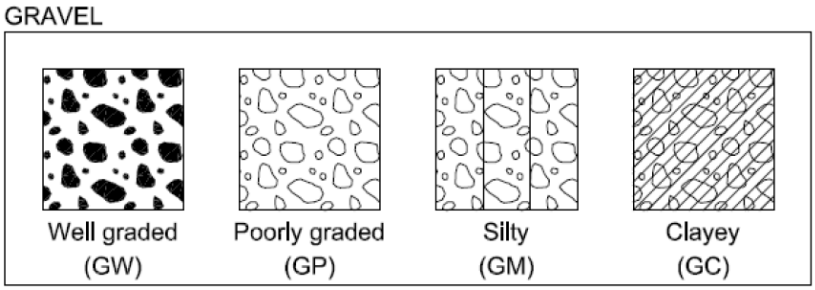


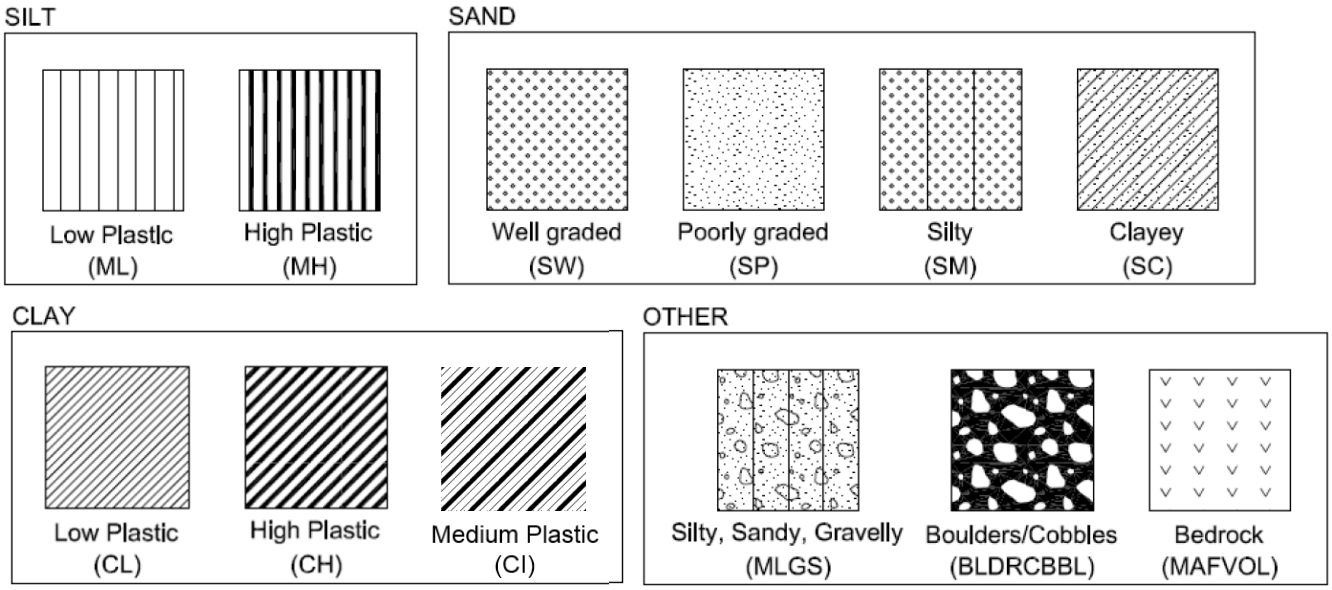
Sample Type and Sample Number

Samples are numbered and represented graphically by the symbol shown below. All samples collected from holes are shown on the logs.

Symbol

Sediment types and rock are represented graphically by the following symbols:





If a specific material is a combination of these categories, the symbol may be a mixture of any of the above symbols. A solid line between symbols represents a change in the geological unit.

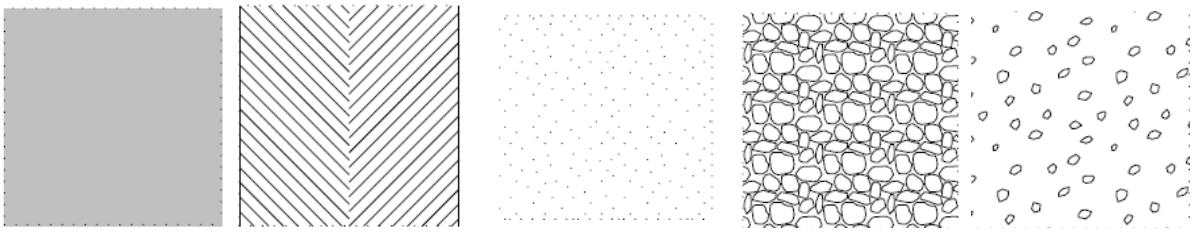
Lithologic Description

Due to the aggressive nature of Dual Rotary drilling, sediments and lithology are considered to be of disturbed nature, and are described using simplified observations, where possible.
Disturbed sediments are classified according to the Unified Soil Classification System (USCS), and are described typically by the following features: primary constituent; particle size range; secondary constituents; gradation; colour; particle shape and angularity; maximum particle size; moisture content; presence of foreign materials.
DTPL = Drier than Plastic Limit, NPL = Near Plastic Limit, WTPL = Wetter than Plastic Limit

Instrument Details

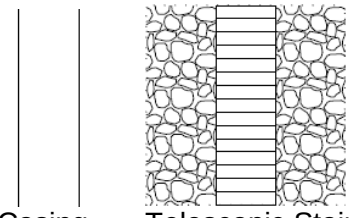
Fill materials placed in the holes are graphically represented by the symbols below.

MATERIALS PLACED DOWN HOLE



Bentonite Chips Bentonite Grout Mix Filter Sand Native Materials Gravel

INSTRUMENTATION



Casing Telescopic Stainless Steel Screen

DRILL HOLE # BGC14-PW01

Coordinates (m): 687482E - 5609457N
Ground Elevation (m): 887
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.64

Location: Peterson Creek Aquifer
Drilling Contractor: JR Drilling Central
Drill Method: Dual Rotary
Diameter (m): 0.2
Fluid: Air
Cased To (m): 73.15

Start Date: 08 Dec 2014
Finish Date: 09 Dec 2014
Final Depth (m): 80.46
Depth to Top of Rock (m): 80.46
Logged By: LM
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
887	0				SAND (SM) Fine to coarse, trace gravel, trace silt/clay, poorly graded, subrounded, flat and elongated, brown, dry, heterogenous, maximum size 20 mm. [TILL]	0	Dry	02/12/2014 09:00	
886	1								
885	2								
884	3								
883	4								
882	5					5.2			
881	6		G1						
880	7								
879	8								
878	9								
877	10								

(Continued on next page)

DRILL HOLE # BGC14-PW01

Coordinates (m): 687482E - 5609457N
Ground Elevation (m): 887
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.64

Location: Peterson Creek Aquifer
Drilling Contractor: JR Drilling Central
Drill Method: Dual Rotary
Diameter (m): 0.2
Fluid: Air
Cased To (m): 73.15

Start Date: 08 Dec 2014
Finish Date: 09 Dec 2014
Final Depth (m): 80.46
Depth to Top of Rock (m): 80.46
Logged By: LM
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
877	10								
876	11								
875	12								
			G2		GRAVEL (GM) Fine to coarse, and silt, trace clay, poorly graded, subrounded, flat and elongated, brown, dry, heterogeneous, maximum size 25 mm. [TILL]		Dry	02/12/2014 09:30	
874	13								
873	14								
872	15								
871	16								
870	17								
869	18								
868	19								
867	20								

(Continued on next page)

DRILL HOLE # BGC14-PW01

Coordinates (m): 687482E - 5609457N
Ground Elevation (m): 887
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.64

Location: Peterson Creek Aquifer
Drilling Contractor: JR Drilling Central
Drill Method: Dual Rotary
Diameter (m): 0.2
Fluid: Air
Cased To (m): 73.15

Start Date: 08 Dec 2014
Finish Date: 09 Dec 2014
Final Depth (m): 80.46
Depth to Top of Rock (m): 80.46
Logged By: LM
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
867	20								
866	21								
			G3		SAND (SM) Fine to coarse, and silt, trace clay, poorly graded, subrounded, flat to elongated, brown, dry. [TILL]		Dry	02/12/2014 10:20	
865	22								
			G4		SILT (ML) Trace fine sand, trace clay, low plasticity, brown, DTPL, blocky, low dry strength. [TILL]		Dry	02/12/2014 10:30	
864	23								
863	24								
					GRAVEL (GM) Fine to coarse, and fine to coarse sand, trace silt/clay, poorly graded, loose, subangular, flat and elongated, dry, brown, grey. [TILL]		Dry	02/12/2014 10:40	
862	25								
861	26								
860	27								
			G5		GRAVEL (GM) Fine to coarse, trace silt, poorly graded, angular, flat and elongated, brown, grey, moist, Maximum size 25mm. [FLUVIAL]		Moist	02/12/2014 10:45	First water encountered at 27.43 m.
859	28								
858	29								
857	30								

(Continued on next page)

DRILL HOLE # BGC14-PW01

Coordinates (m): 687482E - 5609457N
Ground Elevation (m): 887
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.64

Location: Peterson Creek Aquifer
Drilling Contractor: JR Drilling Central
Drill Method: Dual Rotary
Diameter (m): 0.2
Fluid: Air
Cased To (m): 73.15

Start Date: 08 Dec 2014
Finish Date: 09 Dec 2014
Final Depth (m): 80.46
Depth to Top of Rock (m): 80.46
Logged By: LM
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
857	30				Trace Clay.				
856	31								
855	32		G6		SAND (SM) Fine to medium, and silt, poorly graded, loose, subrounded, flat and elongated, brown, grey, moist. [TILL]		Moist	02/12/2014 11:30	
854	33								
853	34								
852	35								
851	36								
850	37		G7		GRAVEL (GC) Fine, and fine to coarse sand, some clay, trace silt, angular, flat and elongated, grey, wet. [TILL]		Wet	02/12/2014 11:50	
849	38								
848	39								
847	40		G8		SAND (SM) Fine to coarse, silt, trace gravel, poorly graded, subrounded, flat and elongated, grey,		Moist	02/12/2014 12:00	

(Continued on next page)

DRILL HOLE # BGC14-PW01

Coordinates (m): 687482E - 5609457N
Ground Elevation (m): 887
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.64

Location: Peterson Creek Aquifer
Drilling Contractor: JR Drilling Central
Drill Method: Dual Rotary
Diameter (m): 0.2
Fluid: Air
Cased To (m): 73.15

Start Date: 08 Dec 2014
Finish Date: 09 Dec 2014
Final Depth (m): 80.46
Depth to Top of Rock (m): 80.46
Logged By: LM
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
847	40				moist. [TILL]				
846	41								
845	42								
			G9		CLAY (CH) And fine to coarse sand, trace silt, high plasticity, dark brown, NPL.		Wet	02/12/2014 12:30	
844	43								
843	44								
842	45								
			G10		SAND (SM) Fine to coarse, some silt, trace clay, trace gravel, poorly graded, subangular, flat and elongated, brown, moist, heterogeneous. [TILL]		Moist	02/12/2014 12:45	
841	46								
840	47								
839	48								
			G11				Wet	02/12/2014 13:15 05/12/2014 07:40	
838	49								
837	50								

(Continued on next page)

DRILL HOLE # BGC14-PW01

Coordinates (m): 687482E - 5609457N
Ground Elevation (m): 887
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.64

Location: Peterson Creek Aquifer
Drilling Contractor: JR Drilling Central
Drill Method: Dual Rotary
Diameter (m): 0.2
Fluid: Air
Cased To (m): 73.15

Start Date: 08 Dec 2014
Finish Date: 09 Dec 2014
Final Depth (m): 80.46
Depth to Top of Rock (m): 80.46
Logged By: LM
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
837	50								
836	51								
			G12		GRAVEL (GM) Fine to coarse, some sand, trace silt, trace clay, poorly graded, angular, grey, wet, heterogeneous. [TILL]		Wet	02/12/2014 13:20	Trace clay at 53 m may be due to clogged pipes.
835	52								
834	53								
833	54								
			G13		SAND (SM) Fine to coarse, some clay, trace gravel, poorly graded, subrounded, brown, wet, heterogeneous. [TILL]		Wet	02/12/2014 14:00	
832	55								
831	56								
830	57								
			G14		GRAVEL (GM) Fine to coarse, some sand, trace silt, trace clay, poorly graded, angular, grey, wet, heterogeneous. [TILL]		Wet	02/12/2014 14:15	
829	58								
828	59								
			G15		SAND (SC) Fine to medium, and clay, trace silt, poorly graded, subrounded, brown, wet, heterogeneous. [TILL]				
827	60								

(Continued on next page)

DRILL HOLE # BGC14-PW01

Coordinates (m): 687482E - 5609457N
Ground Elevation (m): 887
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.64

Location: Peterson Creek Aquifer
Drilling Contractor: JR Drilling Central
Drill Method: Dual Rotary
Diameter (m): 0.2
Fluid: Air
Cased To (m): 73.15

Start Date: 08 Dec 2014
Finish Date: 09 Dec 2014
Final Depth (m): 80.46
Depth to Top of Rock (m): 80.46
Logged By: LM
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
827	60								
826	61		G16		GRAVEL (GM) Fine to coarse, some sand, trace silt, poorly graded, angular, grey, wet, heterogeneous. [TILL]		Wet	02/12/2014 14:45	
825	62								
824	63								
823	64		G17		SAND (SC) Fine to medium, and clay, trace silt, poorly graded, subrounded, brown, wet, heterogeneous. [TILL]				
822	65								
			G18		SAND (SM) Fine to coarse, some silt, trace gravel, poorly graded, subrounded, grey, wet, heterogeneous. [TILL]				
821	66						Wet	03/12/2014 07:30	Flowing water from discharge pipe at 67.06 m.
820	67		G19		GRAVEL (GP) Fine to coarse, sandy, poorly graded, angular, flat and elongated, dark grey, wet, heterogeneous, maximum size 25 mm, pink, green, and black clasts. [FLUVIAL]		Wet	02/12/2014 15:15	Air Lift Test #1 20 US GPM 20 US GPM 20 US GPM Average = 20 US GPM
819	68								
			G20						
818	69								
817	70								

(Continued on next page)

DRILL HOLE # BGC14-PW01

Coordinates (m): 687482E - 5609457N
Ground Elevation (m): 887
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.64

Location: Peterson Creek Aquifer
Drilling Contractor: JR Drilling Central
Drill Method: Dual Rotary
Diameter (m): 0.2
Fluid: Air
Cased To (m): 73.15

Start Date: 08 Dec 2014
Finish Date: 09 Dec 2014
Final Depth (m): 80.46
Depth to Top of Rock (m): 80.46
Logged By: LM
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
817	70		G21						
816	71								
			G22		Finer gravel.		Wet	03/12/2014 07:50	Air Lift Test #2 7 US GPM
815	72								
814	73		G23			73.15			
813	74								
			G24						
812	75								
811	76		G25				Wet	03/12/2014 07:50	Air Lift Test #3 100 US GPM 100 US GPM 100 US GPM Average = 100 US GPM
810	77								
			G26						
809	78						Wet	03/12/2014 08:00	Air Lift Test #4 75 US GPM 75 US GPM 60 US GPM Average = 70 US GPM
808	79								
			G27		Coarser gravel.	79.24			
807	80								

(Continued on next page)

DRILL HOLE # BGC14-PW01

Coordinates (m): 687482E - 5609457N
Ground Elevation (m): 887
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.64

Location: Peterson Creek Aquifer
Drilling Contractor: JR Drilling Central
Drill Method: Dual Rotary
Diameter (m): 0.2
Fluid: Air
Cased To (m): 73.15

Start Date: 08 Dec 2014
Finish Date: 09 Dec 2014
Final Depth (m): 80.46
Depth to Top of Rock (m): 80.46
Logged By: LM
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
807	80								
			G28		END OF HOLE at 80.46 m. Encountered Weathered Bedrock. NOTES: 1. 6.5" Telescopic Stainless Steel Screen (10 slot) from 73.1 to 79.2 m. 2. Native materals surrounding well screen. 3. 0.61 m riser pipe on top of screen. 4. Bentonite surface seal placed from 0 to 5.18 m. 5. Water level measured on December 11, 2014: 27.645 m below top of casing.		Wet	03/12/2014 08:15	Air Lift Test #5 30 US GPM 53 US GPM 43 US GPM Average = 38 US GPM
806	81								
805	82								
804	83								
803	84								
802	85								
801	86								
800	87								
799	88								
798	89								
797	90								

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: KGHM Ajax Mining Inc.
Print Date: 8/20/2015

Project No.: 1125-007

Project: Ajax Project Environmental Assessment

DRILL HOLE # BGC14-018

Location: Ajax Project Site

Coordinates (m): 687489E - 5609453N
Ground Elevation (m): 887
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.6

Location: Peterson Creek Aquifer
Drilling Contractor: JR Drilling Central
Drill Method: Dual Rotary
Diameter (m): 0.2
Fluid: Air
Cased To (m): 74.07

Start Date: 04 Dec 2014
Finish Date: 05 Dec 2014
Final Depth (m): 80.77
Depth to Top of Rock (m): 80.77
Logged By: LM
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
887	0				GRAVEL (GC) Fine, and clay, sandy, some silt, poorly graded, angular, flat and elongated, brown, dry, heterogeneous, maximum size 10 mm. [TILL]	0			
886	1								
885	2								
884	3								
883	4								
882	5					5.2			
881	6		G1				Dry	04/12/2014 14:00	
880	7								
879	8								
878	9		G2						
877	10								

(Continued on next page)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client: KGHM Ajax Mining Inc.

Print Date: 8/20/2015

AJAX (HYDROGEO) AJAX_SOIL_HYDROGEO.GDL BGC.GDT 8/20/15

DRILL HOLE # BGC14-018

Coordinates (m): 687489E - 5609453N
Ground Elevation (m): 887
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.6

Location: Peterson Creek Aquifer
Drilling Contractor: JR Drilling Central
Drill Method: Dual Rotary
Diameter (m): 0.2
Fluid: Air
Cased To (m): 74.07

Start Date: 04 Dec 2014
Finish Date: 05 Dec 2014
Final Depth (m): 80.77
Depth to Top of Rock (m): 80.77
Logged By: LM
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
877	10								
876	11								
875	12								
			G3		GRAVEL (GM) Fine, sandy, some silt, trace clay, poorly graded, angular, flat and elongated, brown, dry, heterogeneous, maximum size 15 mm. [TILL]		Dry	04/12/2014 14:35	
874	13								
873	14								
872	15								
			G4		SAND (SM) Fine to coarse, some silt, trace gravel, poorly graded, sub angular, flat and elongated, brown dry, heterogeneous, pink, green, and black clasts. [TILL]		Dry	04/12/2014 14:45	
871	16								
870	17								
869	18								
			G5				Dry	04/12/2014 15:05	
868	19								
867	20								

(Continued on next page)

DRILL HOLE # BGC14-018

Coordinates (m): 687489E - 5609453N
Ground Elevation (m): 887
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.6

Location: Peterson Creek Aquifer
Drilling Contractor: JR Drilling Central
Drill Method: Dual Rotary
Diameter (m): 0.2
Fluid: Air
Cased To (m): 74.07

Start Date: 04 Dec 2014
Finish Date: 05 Dec 2014
Final Depth (m): 80.77
Depth to Top of Rock (m): 80.77
Logged By: LM
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
867	20								
866	21		G6						
865	22				SILT (ML) Trace fine sand, trace clay, low plasticity, brown, DTPL, blockly, low dry strength. [TILL]				
864	23				SAND (SC) Find to coarse, clayey, some silt, trace gravel, poorly graded, sub rounded, flat and elongated, brown, moist, heterogeneous. [TILL]				
863	24		G7				Dry	04/12/2014 15:40	
862	25								
861	26					▼			
860	27								
859	28		G8			▽	Moist	04/12/2014 15:45	First water encountered at 27.4 m.
858	29								
857	30								

(Continued on next page)

DRILL HOLE # BGC14-018

Coordinates (m): 687489E - 5609453N
Ground Elevation (m): 887
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.6

Location: Peterson Creek Aquifer
Drilling Contractor: JR Drilling Central
Drill Method: Dual Rotary
Diameter (m): 0.2
Fluid: Air
Cased To (m): 74.07

Start Date: 04 Dec 2014
Finish Date: 05 Dec 2014
Final Depth (m): 80.77
Depth to Top of Rock (m): 80.77
Logged By: LM
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
857	30								
			G9				Wet	04/12/2014 16:15	
856	31								
855	32								
854	33								
			G10		SAND (SM) Fine to coarse, some silt, trace gravel, poorly graded, sub angular, flat and elongated, grey, moist/dry, heterogeneous. [TILL]		Moist/Dry	04/12/2014 16:30	
853	34								
852	35								
851	36								
			G11		SAND (SC) Fine to coarse, and clay, some silt, poorly graded, sub angular, flat and elongated, grey wet, heterogeneous. [TILL]		Wet	05/12/2014 06:30	
850	37								
849	38								
848	39								
			G12		SAND (SM) Fine to medium, silty, trace clay, poorly graded, sub rounded, flat and elongated,		Moist	05/12/2014 06:40	
847	40								

(Continued on next page)

DRILL HOLE # BGC14-018

Coordinates (m): 687489E - 5609453N
Ground Elevation (m): 887
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.6

Location: Peterson Creek Aquifer
Drilling Contractor: JR Drilling Central
Drill Method: Dual Rotary
Diameter (m): 0.2
Fluid: Air
Cased To (m): 74.07

Start Date: 04 Dec 2014
Finish Date: 05 Dec 2014
Final Depth (m): 80.77
Depth to Top of Rock (m): 80.77
Logged By: LM
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
847	40				grey, moist, heterogeneous. [TILL] Trace gravel at 42.7 m, maximum size 21 mm.				
846	41								
845	42								
			G13				Wet	05/12/2014 07:15	
844	43								
843	44								
842	45								
			G14						
841	46								
840	47								
839	48								
			G15						
838	49								
837	50								

(Continued on next page)

DRILL HOLE # BGC14-018

Coordinates (m): 687489E - 5609453N
Ground Elevation (m): 887
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.6

Location: Peterson Creek Aquifer
Drilling Contractor: JR Drilling Central
Drill Method: Dual Rotary
Diameter (m): 0.2
Fluid: Air
Cased To (m): 74.07

Start Date: 04 Dec 2014
Finish Date: 05 Dec 2014
Final Depth (m): 80.77
Depth to Top of Rock (m): 80.77
Logged By: LM
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
837	50								
836	51								
835	52		G16		Fine grained sand, some clay.				
834	53								
833	54								
832	55		G17						
831	56								
830	57								
829	58		G18						
828	59								
827	60		G19		Fine to coarse sand, trace gravel.		Wet	05/12/2014 08:10	First water

(Continued on next page)

DRILL HOLE # BGC14-018

Coordinates (m): 687489E - 5609453N
Ground Elevation (m): 887
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.6

Location: Peterson Creek Aquifer
Drilling Contractor: JR Drilling Central
Drill Method: Dual Rotary
Diameter (m): 0.2
Fluid: Air
Cased To (m): 74.07

Start Date: 04 Dec 2014
Finish Date: 05 Dec 2014
Final Depth (m): 80.77
Depth to Top of Rock (m): 80.77
Logged By: LM
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
827	60								discharge from pipe at 59.74 m.
826	61		G20						
825	62								
824	63		G21						
823	64		G22						
822	65								
821	66		G23		SILT (ML) Some sand, trace clay, low plasticity, light brown, WTPL, heterogeneous, no dry strength. [TILL] More silt and fine sand at 67.1 m. Trace gravel at 70.1 m.				
820	67		G24						
819	68								
818	69		G25				Wet	05/12/2014 08:20	
817	70								

(Continued on next page)

DRILL HOLE # BGC14-018

Coordinates (m): 687489E - 5609453N
Ground Elevation (m): 887
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.6

Location: Peterson Creek Aquifer
Drilling Contractor: JR Drilling Central
Drill Method: Dual Rotary
Diameter (m): 0.2
Fluid: Air
Cased To (m): 74.07

Start Date: 04 Dec 2014
Finish Date: 05 Dec 2014
Final Depth (m): 80.77
Depth to Top of Rock (m): 80.77
Logged By: LM
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
817	70		G26						
816	71								
			G27		SAND (SM) Fine to coarse, and silt, trace gravel, poorly graded, angular, brown, wet, heterogeneous. [TILL]		Wet	05/12/2014 08:40	
815	72								
814	73		G28		Less silt at 73.2 m.		Wet	05/12/2014 09:00	Air Lift Test #1 20 US GPM (Estimated from 73.15 m to 74.68 m)
813	74					74.06			
			G29						
812	75					75			
						75.59			
811	76		G30				Wet	05/12/2014 09:30	Air Lift Test #2 10 US GPM
810	77					76.8			
			G31			77.72			
809	78								
808	79								
			G32		SILT (ML) Some sand, trace clay, low plasticity, light brown, WTPL, heterogeneous, low dry strength. [TILL]				
807	80								

(Continued on next page)

DRILL HOLE # BGC14-018

Coordinates (m): 687489E - 5609453N
Ground Elevation (m): 887
Survey Method: Handheld GPS
Datum: NAD83 UTM ZONE 10U
Stick-up (m): 0.6

Location: Peterson Creek Aquifer
Drilling Contractor: JR Drilling Central
Drill Method: Dual Rotary
Diameter (m): 0.2
Fluid: Air
Cased To (m): 74.07

Start Date: 04 Dec 2014
Finish Date: 05 Dec 2014
Final Depth (m): 80.77
Depth to Top of Rock (m): 80.77
Logged By: LM
Reviewed By: TWC

Elevation (m)	Depth (m)	Sample Type	Sample No.	Symbol	Lithologic Description	Instrument Details Depth (m)	Water Notes	Date + Time	Comments
807	80								
806	81		G33		END OF HOLE at 80.77 m. Encountered Weathered Bedrock. NOTES: 1. 6.5" Telescopic Stainless Steel Screen (100 slot) from 74.1 to 75.0 m. 2. Native mateirals surrounding well screen. 3. 0.61 m riser pipe on top of screen. 4. Bentonite surface seal placed from 0 to 5.18 m. 5. Water level measured on December 11, 2014: 26.222 m below top of casing.		Wet	05/12/2014 11:00	Air Lift Test #3 5 US GPM 3 US GPM 3 US GPM Average = 3.6 US GPM
805	82								
804	83								
803	84								
802	85								
801	86								
800	87								
799	88								
798	89								
797	90								

Project:	**AFTON MINE**	Drill Hole No.	**AJGW01-D**	Page	**1 of 1**
Drilling Co:	**Geotech Drilling Services**	In-Situ Sampler:	**SPT**	Date Started:	**Sep 10, 07**
Drilling Method:	**Odex**	Elevation:	**275 m**	Date Completed:	**Sep 10, 07**
Location:	**Kamloops, British Columbia**	Total Depth:	**14.3 m**	Logged by:	**BG**
Coordinates:	**5,609,473 N , 683,381 E**	Inclination:		Reviewed by:	

DEPTH (ft)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION	DRILL RUN RECOVERY (%)	SAMPLE RECOVERY (%)	SAMPLES	SAMPLE NO.	BLOW COUNT	SPT 'N' VALUE	SPT TEST DATA Uncorrected 'N' values vs. depth (●) 20 40 60 80	NOTES
0	0		Gravel and cobble fill								
5	1						1	+50//	+50		
	2		Silt with trace sand								
10	3						2	24/+50/	+50		
	4										
15	5		SILT and clay with some sand	1			3	18/38/+50	+50		
20	6						4	36/+50/	+50		
	7										
25	8										
30	9										
	10		SILT and sand with trace clay	1							
35	11										
40	12										
	13		BEDROCK								
45	14										
50	15										
	16										
55	17										
	18										
60	19										
65	20										
	21										
70	22										
75	23										
80	24										

ABACUS MINING AND EXPLORATION CORPORATION
AFTON MINE
Overburden Log For AJGW01-D

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-246/06	**5**	**0**

AJGW01-D

Rev. 0 - Issued for Report - VA101-00246/06-5

SOILS LOG 2007 AJGW WELL LOGS.GPJ DRILL.GDT Dec 22, 08

Project:	**AFTON MINE**	Drill Hole No.	**AJGW01-S**	Page	**1** of **1**
Drilling Co:	**Geotech Drilling Services**	In-Situ Sampler:	**SPT**	Date Started:	**Sep 10, 07**
Drilling Method:	**Odex**	Elevation:	**275 m**	Date Completed:	**Sep 10, 07**
Location:	**Kamloops, British Columbia**	Total Depth:	**6.1 m**	Logged by:	**BG**
Coordinates:	**5,609,473 N , 683,381 E**	Inclination:		Reviewed by:	

DEPTH (ft)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION	DRILL RUN RECOVERY (%)	SAMPLE RECOVERY (%)	SAMPLES	SAMPLE NO.	BLOW COUNT	SPT 'N' VALUE	SPT TEST DATA Uncorrected 'N' values vs. depth (●) 20 40 60 80	NOTES
0	0		Gravel and cobble fill								
5	1						1	+50//	+50		
	2		Silt with trace sand								
10	3						2	24/+50/	+50		
	4										
15	5		SILT and clay with some sand	1			3	18/38/+50	+50		
20	6			2			4	36/+50/	+50		
25	7										
30	8										
35	9										
40	10										
45	11										
50	12										
55	13										
60	14										
65	15										
70	16										
75	17										
80	18										
	19										
	20										
	21										
	22										
	23										
	24										

ABACUS MINING AND EXPLORATION CORPORATION
AFTON MINE
Overburden Log For AJGW01-S

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
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AJGW01-S

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SOILS LOG 2007 AJGW WELL LOGS.GPJ DRILL.GDT Dec 22, 08

Project:	**AFTON MINE**	Drill Hole No.	**AJGW02-D**	Page	**1 of 1**
Drilling Co:	**Geotech Drilling Services**	In-Situ Sampler:	**SPT**	Date Started:	**Sep 10, 07**
Drilling Method:	**Odex**	Elevation:	**274 m**	Date Completed:	**Sep 11, 07**
Location:	**Kamloops, British Columbia**	Total Depth:	**19.8 m**	Logged by:	**BG**
Coordinates:	**5,609,337 N , 683,581 E**	Inclination:		Reviewed by:	

DEPTH (ft)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION	DRILL RUN RECOVERY (%)	SAMPLE RECOVERY (%)	SAMPLES	SAMPLE NO.	BLOW COUNT	SPT 'N' VALUE	SPT TEST DATA Uncorrected 'N' values vs. depth (●) 20 40 60 80	NOTES
			c-GRAVEL and cobble fill with some sand and silt		241		1	17/16/20	33		
5	1										
	2				0			5/8/4	13		
10	3				120		2	4/3/2	7		
	4										
15	5		silty CLAY		72		3	28/+50/	+50		
20	6										
	7										
25	8		SILT and gravel with some cobble		0			30/+50/	+50		
30	9										
	10		▼								
35	11				16			+50//	+50		
40	12										
	13										
45	14										
50	15										
	16										
55	17				15		4	+50//	+50		
	18										
60			BEDROCK								
	19										
65	20										
	21										
70	22										
75	23										
	24										
80											

ABACUS MINING AND EXPLORATION CORPORATION
AFTON MINE
Overburden Log For AJGW02-D

Knight Piésold CONSULTING

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AJGW02-D

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SOILS LOG 2007 AJGW WELL LOGS.GPJ DRILL.GDT Dec 22, 08

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Date Revised: Nov 16, 07

Project:	**AFTON MINE**	Drill Hole No.	**AJGW02-S**	Page	**1 of 1**
Drilling Co:	**Geotech Drilling Services**	In-Situ Sampler:	**SPT**	Date Started:	**Sep 10, 07**
Drilling Method:	**Odex**	Elevation:	**274 m**	Date Completed:	**Sep 11, 07**
Location:	**Kamloops, British Columbia**	Total Depth:	**19.8 m**	Logged by:	**BG**
Coordinates:	**5,609,337 N , 683,581 E**	Inclination:		Reviewed by:	

DEPTH (ft)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION	DRILL RUN RECOVERY (%)	SAMPLE RECOVERY (%)	SAMPLES	SAMPLE NO.	BLOW COUNT	SPT 'N' VALUE	SPT TEST DATA Uncorrected 'N' values vs. depth (●) 20 40 60 80	NOTES
			c-GRAVEL and cobble fill with some sand and silt		241		1	17/16/20	33		
5	1										
	2				0			5/8/4	13		
10	3				120		2	4/3/2	7		
	4										
15	5		silty CLAY		72		3	28/+50/	+50		
20	6										
	7										
25	8		SILT and gravel with some cobble		0			30/+50/	+50		
30	9										
	10										
35	11										
40	12										
	13										
45	14										
50	15										
	16										
55	17										
	18										
60	19										
65	20										
	21										
70	22										
75	23										
80	24										

ABACUS MINING AND EXPLORATION CORPORATION
AFTON MINE
Overburden Log For AJGW02-S

Knight Piésold CONSULTING

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AJGW02-S

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SOILS LOG 2007 AJGW WELL LOGS.GPJ DRILL.GDT Dec 22, 08

Project:	**AFTON MINE**	Drill Hole No.	**AJGW03-D**	Page	**1** of **2**
Drilling Co:	**Geotech Drilling Services**	In-Situ Sampler:	**SPT**	Date Started:	**Sep 12, 07**
Drilling Method:	**Odex**	Elevation:	**272 m**	Date Completed:	**Sep 13, 07**
Location:	**Kamloops, British Columbia**	Total Depth:	**25.9 m**	Logged by:	**BG**
Coordinates:	**5,609,277 N , 684,045 E**	Inclination:		Reviewed by:	

DEPTH (ft)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION	DRILL RUN RECOVERY (%)	SAMPLE RECOVERY (%)	SAMPLES	SAMPLE NO.	BLOW COUNT	SPT 'N' VALUE	SPT TEST DATA Uncorrected 'N' values vs. depth (●) 20 40 60 80	NOTES
			GRAVEL and cobble fill with some sand and silt								
10	3				44		1	15/38/21	+50		
	4		SILT with trace gravel								
15	5				0			8/14/23	22		
20	6				40		2	47/+50/	+50		
25	8		▼								
35	11		SILT with some gravel and trace sand		100			+50//	+50		
40	12										
45	14		Shards of drak grey and black rock f-SAND and silt with trace gravel		85		3	25/+50/	+50		
50	15				100			28/+50/	+50		
55	17		SILT with f-sand		80			18/+50/	+50		
70	21		SAND and trace silt and gravel								
75	23		GRAVEL with trace sand								
80	24										

ABACUS MINING AND EXPLORATION CORPORATION
AFTON MINE
Overburden Log For AJGW03-D

Knight Piésold CONSULTING

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Project:	**AFTON MINE**	Drill Hole No.	**AJGW03-D**	Page	**2** of **2**
Drilling Co:	**Geotech Drilling Services**	In-Situ Sampler:	**SPT**	Date Started:	**Sep 12, 07**
Drilling Method:	**Odex**	Elevation:	**272 m**	Date Completed:	**Sep 13, 07**
Location:	**Kamloops, British Columbia**	Total Depth:	**25.9 m**	Logged by:	**BG**
Coordinates:	**5,609,277 N , 684,045 E**	Inclination:		Reviewed by:	

DEPTH (ft)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION	DRILL RUN RECOVERY (%)	SAMPLE RECOVERY (%)	SAMPLES	SAMPLE NO.	BLOW COUNT	SPT 'N' VALUE	SPT TEST DATA Uncorrected 'N' values vs. depth (●) 20 40 60 80	NOTES
85	26										
90	27										
95	28										
100	29										
105	30										
110	31										
115	32										
120	33										
125	34										
130	35										
135	36										
140	37										
145	38										
150	39										
155	40										
160	41										
	42										
	43										
	44										
	45										
	46										
	47										
	48										
	49										

ABACUS MINING AND EXPLORATION CORPORATION
AFTON MINE
Overburden Log For AJGW03-D

Knight Piésold CONSULTING

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SOILS LOG 2007 AJGW WELL LOGS.GPJ DRILL.GDT Dec 22, 08

Project:	**AFTON MINE**	Drill Hole No.	**AJGW03-S**	Page	**1** of **1**
Drilling Co:	**Geotech Drilling Services**	In-Situ Sampler:	**SPT**	Date Started:	**Sep 12, 07**
Drilling Method:	**Odex**	Elevation:	**272 m**	Date Completed:	**Sep 13, 07**
Location:	**Kamloops, British Columbia**	Total Depth:	**25.9 m**	Logged by:	**BG**
Coordinates:	**5,609,277 N , 684,045 E**	Inclination:		Reviewed by:	

DEPTH (ft)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION	DRILL RUN RECOVERY (%)	SAMPLE RECOVERY (%)	SAMPLES	SAMPLE NO.	BLOW COUNT	SPT 'N' VALUE	SPT TEST DATA Uncorrected 'N' values vs. depth (●) 20 40 60 80	NOTES
0	0		GRAVEL and cobble fill with some sand and silt								
10	3				44		1	15/38/21	+50		
15	4.5		SILT with trace gravel								
20	6				40		2	47/+50/	+50		

ABACUS MINING AND EXPLORATION CORPORATION
AFTON MINE
Overburden Log For AJGW03-S

Knight Piésold CONSULTING

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SOILS LOG 2007 AJGW WELL LOGS.GPJ DRILL.GDT Dec 22, 08

Project:	**AFTON MINE**	Drill Hole No.	**AJGW04- D**	Page	**1 of 1**
Drilling Co:	**Geotech Drilling**	In-Situ Sampler:	**SS**	Date Started:	**Apr 23, 08**
Drilling Method:	**ODEX**	Elevation:	**275 m**	Date Completed:	**Apr 24, 08**
Location:	**Ajax Pit Area**	Total Depth:	**29.0 m**	Logged by:	**ALL**
		Inclination:		Reviewed by:	**BG**

DEPTH (ft)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION	DRILL RUN RECOVERY (%)	SAMPLE RECOVERY (%)	SAMPLES	SAMPLE NO.	BLOW COUNT	SPT 'N' VALUE	SPT TEST DATA Uncorrected 'N' values vs. depth (●) 20 40 60 80	NOTES
			Dark brown, silt, sand, gravel, damp, organic with roots	2							
			Olive grey, cobbles and gravel with sand and trace silt, dry	1							
			Brown, cobbles and gravel with sand and trace silt	2							
			Dark grey, moist, gravelly sandy silt with cobbles	2							
			Dark grey, wet, medium to fine silty sand								
			m - c SAND, some gravel, some silt, dark grey	0							
			Clay-silt with some gravel, grey, moist	0							
			Fractured bedrock	0							
				1							

ABACUS MINING AND EXPLORATION CORPORATION
AFTON MINE
Overburden Log For AJGW04- D

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AJGW04- D

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Project:	**AFTON MINE**	Drill Hole No.	**AJGW05- S**	Page	**1** of **1**		
Drilling Co:	**Geotech Drilling**	In-Situ Sampler:	**SS**	Date Started:	**Apr 24, 08**		
Drilling Method:	**ODEX**	Elevation:	**276 m**	Date Completed:	**Apr 25, 08**		
Location:	**Ajax Pit Area**	Total Depth:	**30.5 m**	Logged by:	**ALL**		
Coordinates:	**5,609,348 N , 684,584 E**	Inclination:		Reviewed by:	**BG**		

DEPTH (ft)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION	DRILL RUN RECOVERY (%)	SAMPLE RECOVERY (%)	SAMPLES	SAMPLE NO.	BLOW COUNT	SPT 'N' VALUE	SPT TEST DATA Uncorrected 'N' values vs. depth (●) 20 40 60 80	NOTES
			f-m SAND, with some gravel, light brown to brown, dry		600		1	31/21/28			
			f - SAND and SILT with some clay		800		2	7/14/15			
			SAND with some m - gravel, light brown, dry				3	54//			
					0		4	>50//			
			silty CLAY, light brown and gray, some f - sand and gravel, moist, soft		150		5	12/23/>50			
			f - SAND with some gravel and clay, brown and grey		0		6	>50//			
			m - c SAND and clay with some gravel		2		7	>50//			
			m - c SAND with gravel, light grey, saturated								
			f - SAND with some gravel, dry, blue grey								
			m - GRAVEL and f - SAND, dry, grey								
			f - SAND, some gravel, dry, grey								
			Bedrock, dark grey								

ABACUS MINING AND EXPLORATION CORPORATION
AFTON MINE
Overburden Log For AJGW05- S

Knight Piésold CONSULTING

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AJGW05- S

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SOILS LOG 2008 AJGW WELL LOGS.GPJ DRILL.GDT Dec 22, 08

Project:	**AFTON MINE**	Drill Hole No.	**AJGW06- D**	Page	**1** of **1**
Drilling Co:	**Geotech Drilling**	In-Situ Sampler:	**SS**	Date Started:	**Apr 25, 08**
Drilling Method:	**ODEX**	Elevation:	**275 m**	Date Completed:	**Apr 26, 08**
Location:	**Ajax Pit Area**	Total Depth:	**32.0 m**	Logged by:	**ALL**
Coordinates:	**5,609,448 N , 685,613 E**	Inclination:		Reviewed by:	**BG**

DEPTH (ft)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION	DRILL RUN RECOVERY (%)	SAMPLE RECOVERY (%)	SAMPLES	SAMPLE NO.	BLOW COUNT	SPT 'N' VALUE	SPT TEST DATA Uncorrected 'N' values vs. depth (●) 20 40 60 80	NOTES
			Top soil		0		1	>50//			Open hole drilling at 20'
			Bedrock, light grey, dry								
			Bedrock, grey, saturated								

ABACUS MINING AND EXPLORATION CORPORATION
AFTON MINE
Overburden Log For AJGW06- D

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Project:	**AFTON MINE**	Drill Hole No.	**AJGW07- D**	Page	**1** of **1**		
Drilling Co:	**Geotech Drilling**	In-Situ Sampler:	**SS**	Date Started:	**Apr 26, 08**		
Drilling Method:	**ODEX**	Elevation:	**276 m**	Date Completed:	**Apr 26, 08**		
Location:	**Ajax Pit Area**	Total Depth:	**29.0 m**	Logged by:	**ALL**		
		Inclination:		Reviewed by:	**BG**		

DEPTH (ft)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION	DRILL RUN RECOVERY (%)	SAMPLE RECOVERY (%)	SAMPLES	SAMPLE NO.	BLOW COUNT	SPT 'N' VALUE	SPT TEST DATA Uncorrected 'N' values vs. depth (●) 20 40 60 80	NOTES
			Grey broken up rock, dry, likely waste rock fill								Drilling on inside shoulder of haul road outside AJWW pit
			Brown, silt and clay, with gravel and sand, moist		440		1	20/24/43			
			Mulched rocks and silt/clay		220		2	20/55/40			
			Brown silt/clay and broken up gravel/cobbles, moist to wet								
			Silt								
			Saturated, light grey, silt and fine sand with sand and gravel, very hard		49		3	50//			
			Sand and silt and gravel, dark grey, wet and saturated		44		4	45/50/			Appears similar to coarse sand encountered above bedrock and AJGW - 03 and 04
			Shards of broken rock, wet, saturated, dark grey								
			Black coarse sand and gravel with some silt and sand, saturated								
			Coarse black angualr gravel, possible bedrock, high water production								

ABACUS MINING AND EXPLORATION CORPORATION
AFTON MINE
Overburden Log For AJGW07- D

Knight Piésold CONSULTING

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AJGW07- D

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SOILS LOG 2008 AJGW WELL LOGS.GPJ DRILL.GDT Dec 22, 08

Project:	**AFTON MINE**	Drill Hole No.	**AJGW07- S**	Page	**1** of **1**		
Drilling Co:	**Geotech Drilling**	In-Situ Sampler:	**SS**	Date Started:	**Apr 27, 08**		
Drilling Method:	**ODEX**	Elevation:	**276 m**	Date Completed:	**Apr 27, 08**		
Location:	**Ajax Pit Area**	Total Depth:	**29.0 m**	Logged by:	**ALL**		
		Inclination:		Reviewed by:	**BG**		

DEPTH (ft)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION	DRILL RUN RECOVERY (%)	SAMPLE RECOVERY (%)	SAMPLES	SAMPLE NO.	BLOW COUNT	SPT 'N' VALUE	SPT TEST DATA Uncorrected 'N' values vs. depth (●) 20 40 60 80	NOTES
			Grey broken up rock, dry, likely waste rock fill Brown, silt and clay, with gravel and sand, moist Silt Saturated, light grey, silt and fine sand with sand and gravel, very hard Sand and silt and gravel, dark grey, wet and saturated Shards of broken rock, wet, saturated, dark grey Black coarse sand with gravel and some silt, saturated								Drilling on inside shoulder of haul road outside AJWW pit

ABACUS MINING AND EXPLORATION CORPORATION
AFTON MINE
Overburden Log For AJGW07- S

Knight Piésold CONSULTING

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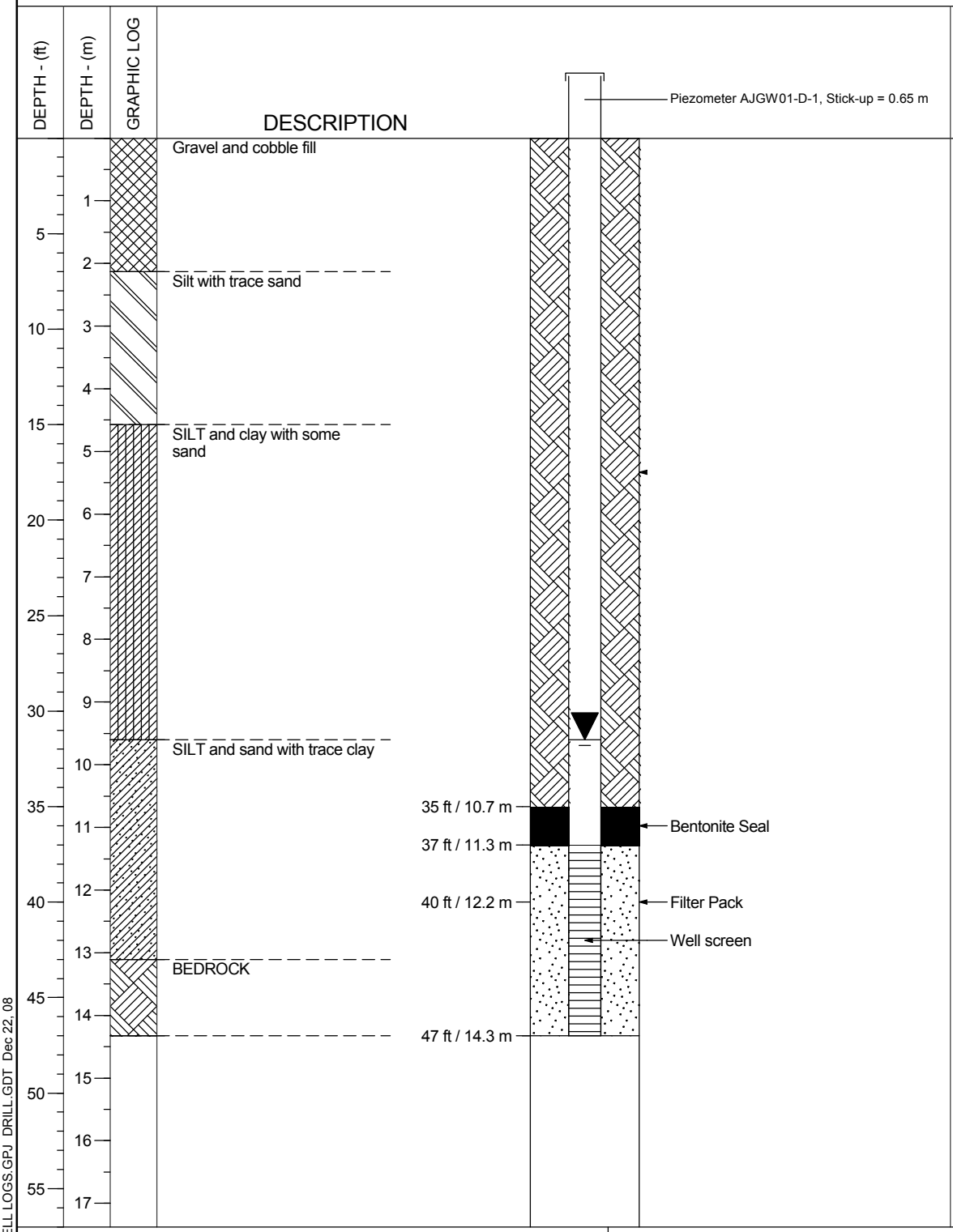
Project: AFTON MINE | Drill Hole No.: AJGW01-D | Page 1 of 1

Hole Depth: 47 ft / 14.3 m | Hole Diameter: 102 mm | Date Started: Sep 10, 07 | Date Completed: Sep 10, 07

Collar Elev: 901 ft / 274.6 m | PVC Pipe I.D.: 51 mm | Logged by: BG | Reviewed by:

Water Level Readings: Depth to Water / Date Measured

Well 1: 9.60 / Sep 10, 07



ABACUS MINING AND EXPLORATION CORPORATION
AFTON MINE
Well Completion Details for AJGW01-D

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Figure A2-1

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Date Revised: Nov 16, 07

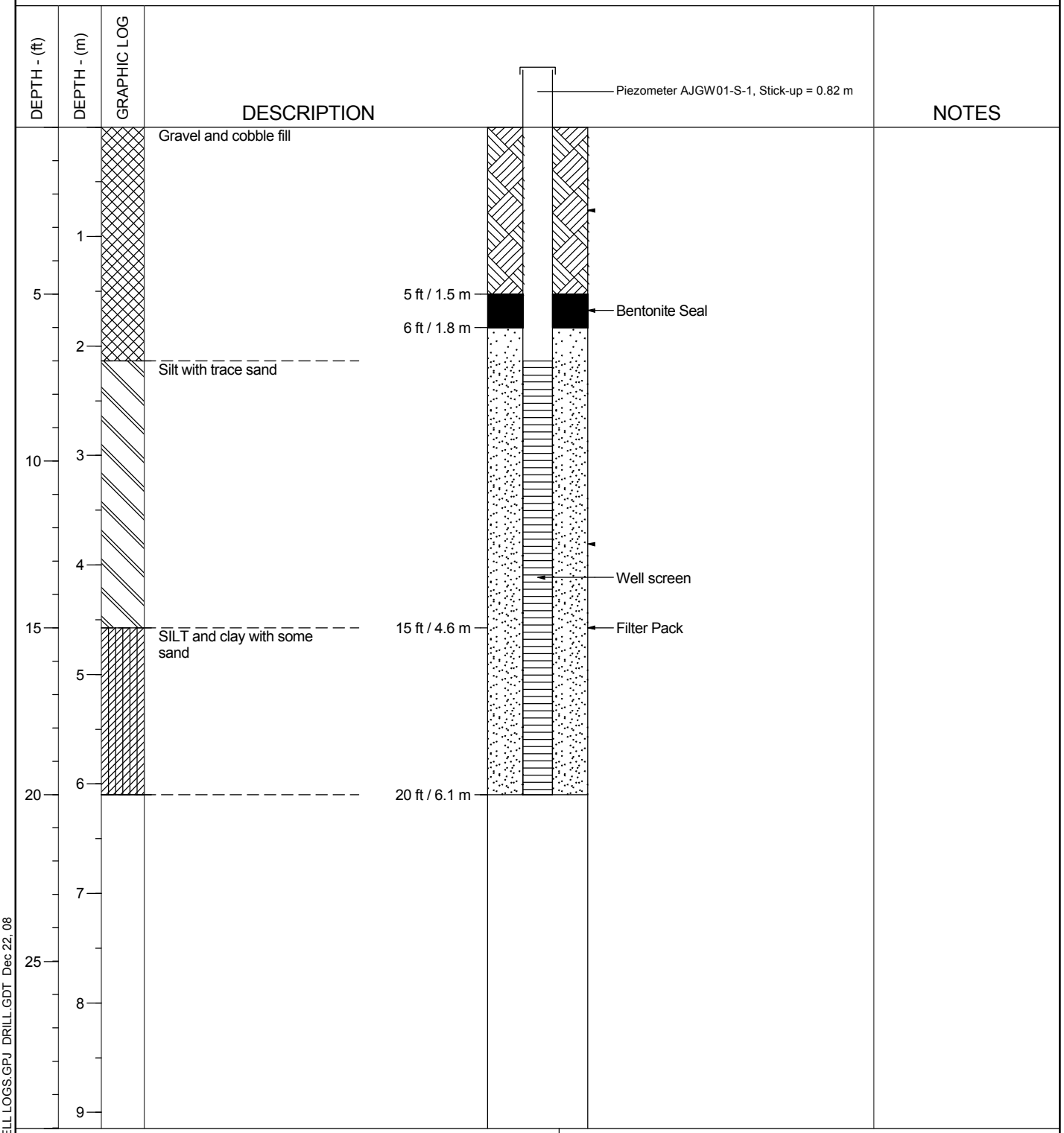
Project: AFTON MINE | Drill Hole No.: AJGW01-S | Page 1 of 1

Hole Depth: 20 ft / 6.1 m | Hole Diameter: 102 mm | Date Started: Sep 10, 07 | Date Completed: Sep 10, 07

Collar Elev: 901 ft / 274.6 m | PVC Pipe I.D.: 51 mm | Logged by: BG | Reviewed by:

Water Level Readings: Depth to Water / Date Measured

Well 1: / Sep 10, 07



ABACUS MINING AND EXPLORATION CORPORATION
AFTON MINE
Well Completion Details for AJGW01-S

Knight Piésold CONSULTING

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Figure A2-2

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Date Revised: Nov 16, 07

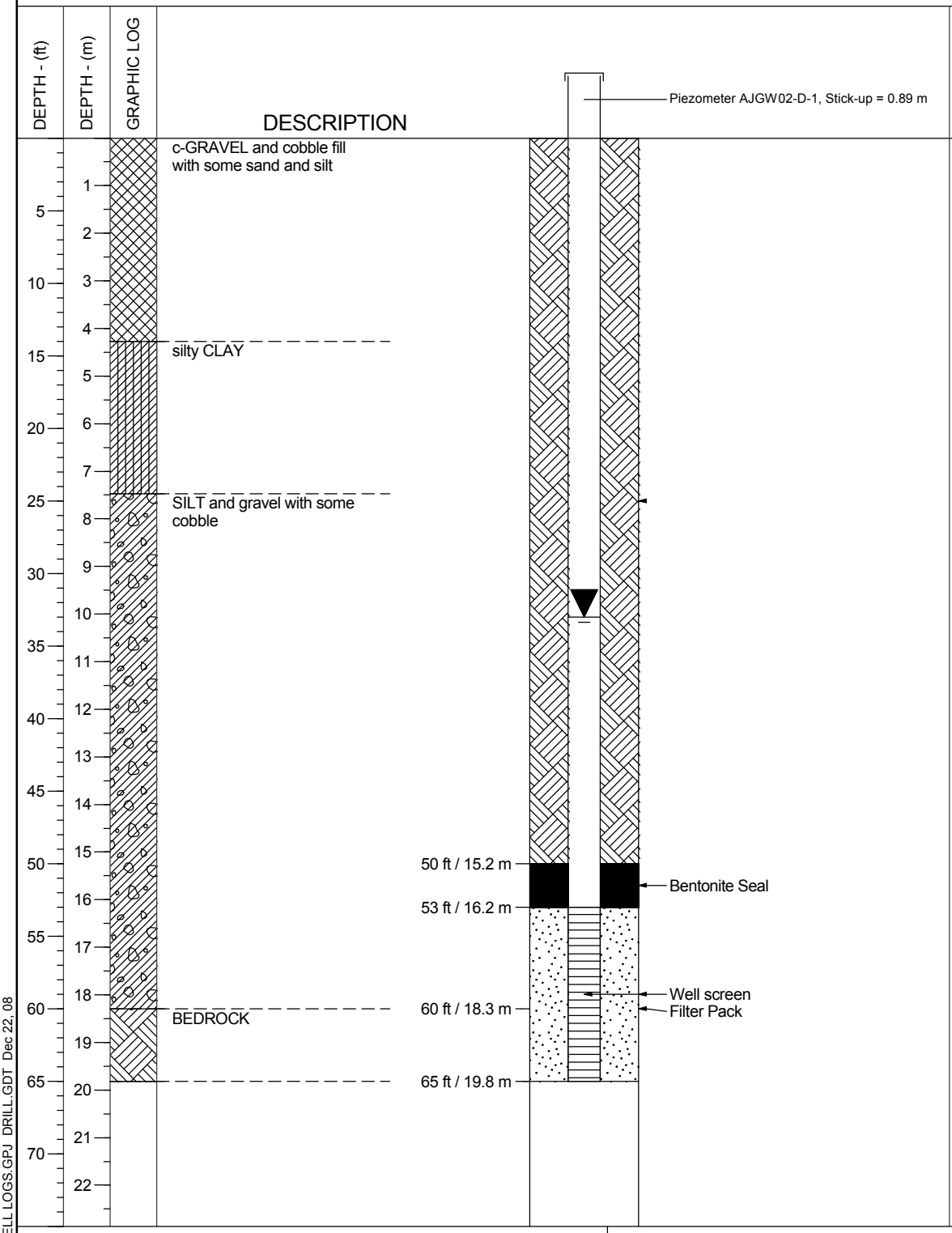
Project: AFTON MINE | Drill Hole No.: AJGW02-D | Page 1 of 1

Hole Depth: 65 ft / 19.8 m | Hole Diameter: 102 mm | Date Started: Sep 10, 07 | Date Completed: Sep 11, 07

Collar Elev: 899 ft / 274.0 m | PVC Pipe I.D.: 51 mm | Logged by: BG | Reviewed by:

Water Level Readings: Depth to Water / Date Measured

Well 1: 10.06 / Sep 11, 07



ABACUS MINING AND EXPLORATION CORPORATION
AFTON MINE
Well Completion Details for AJGW02-D

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Figure A2-4

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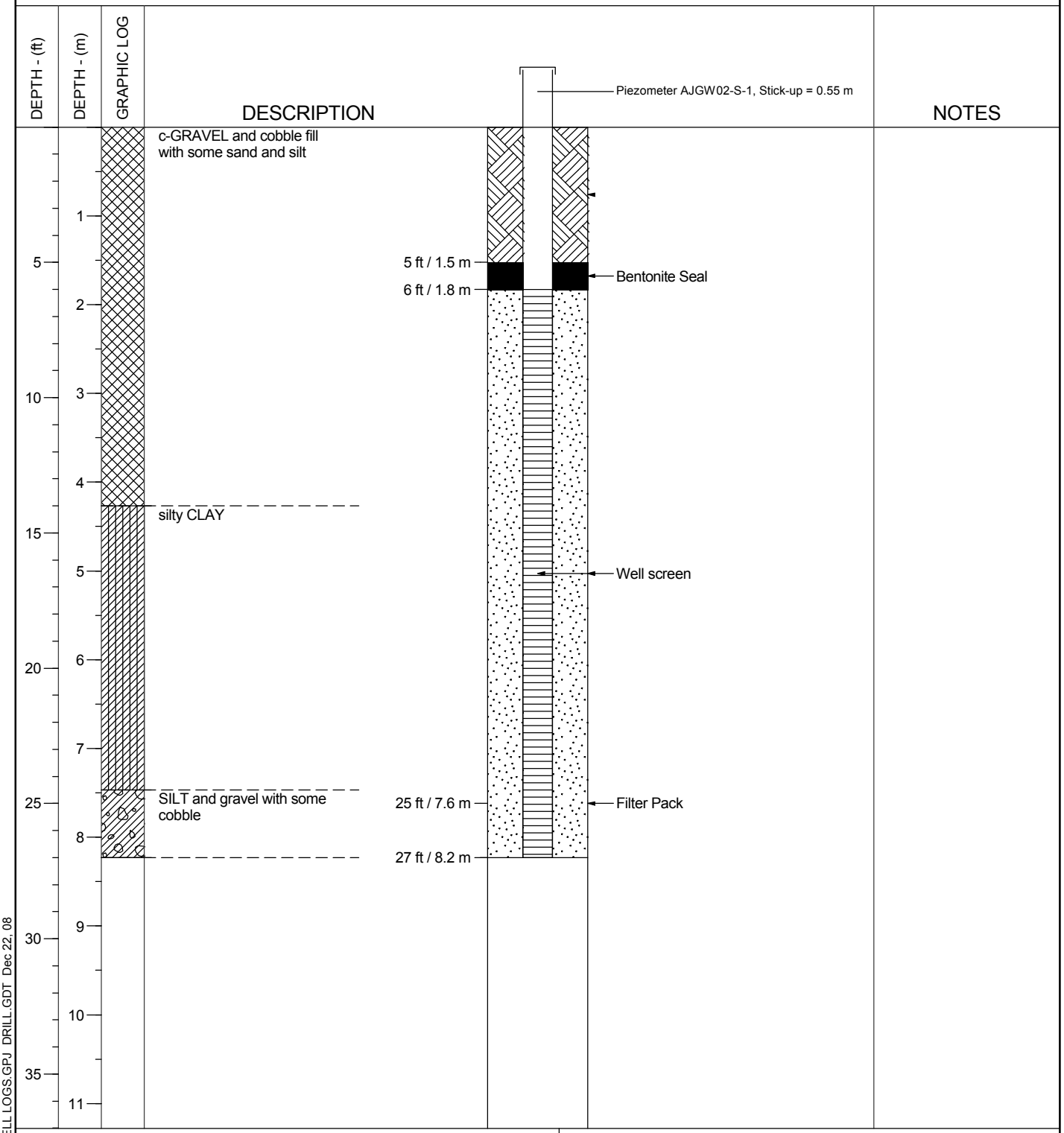
Date Revised: Nov 16, 07

Project:	**AFTON MINE**			Drill Hole No.:	**AJGW02-S**	Page	**1** of **1**
Hole Depth:	**65 ft / 19.8 m**	Hole Diameter:	**102 mm**	Date Started:	**Sep 10, 07**	Date Completed:	**Sep 11, 07**
Collar Elev:	**899 ft / 274.0 m**	PVC Pipe I.D.:	**51 mm**	Logged by:	**BG**	Reviewed by:	

Water Level Readings: Depth to Water / Date Measured

Well 1: / Sep 11, 07



ABACUS MINING AND EXPLORATION CORPORATION
AFTON MINE
Well Completion Details for AJGW02-S

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Figure A2-3

Rev. 0 - Issued for Report - VA101-00246/06-5

WELL 2007 AJGW WELL LOGS.GPJ DRILL.GDT Dec 22, 08

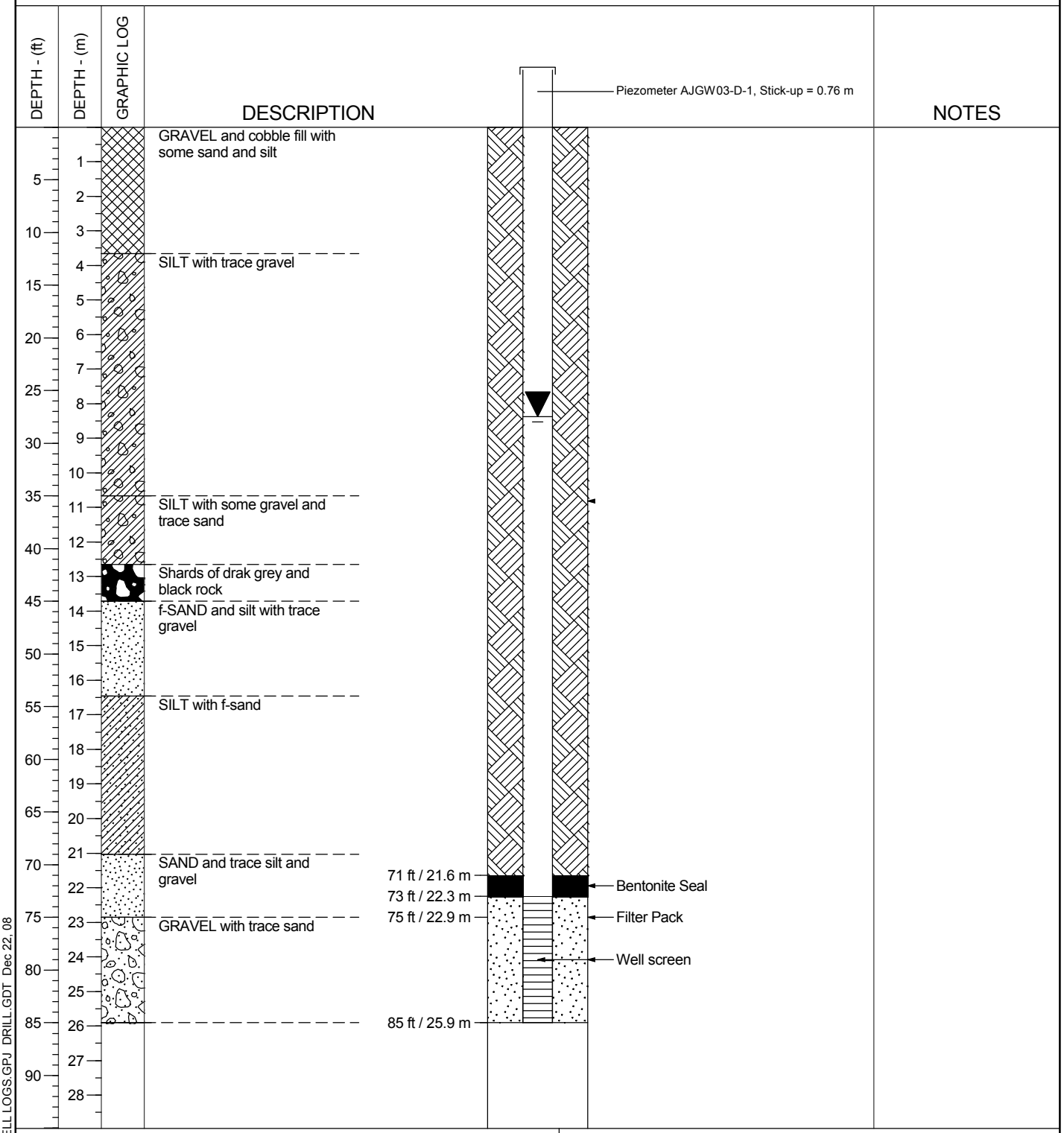
M:\1\01\00246\06\A\DATA\HYDROGEOLOGY\GINT\2007 AJGW WELL LOGS.GPJ

Date Revised: Nov 16, 07

Project:	**AFTON MINE**			Drill Hole No.:	**AJGW03-D**	Page	**1 of 1**
Hole Depth:	**85 ft / 25.9 m**	Hole Diameter:	**102 mm**	Date Started:	**Sep 12, 07**	Date Completed:	**Sep 13, 07**
Collar Elev:	**894 ft / 272.5 m**	PVC Pipe I.D.:	**51 mm**	Logged by:	**BG**	Reviewed by:	

Water Level Readings: Depth to Water / Date Measured

Well 1: 8.38 / Sep 13, 07



ABACUS MINING AND EXPLORATION CORPORATION
AFTON MINE
Well Completion Details for AJGW03-D

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-246/06	5	0

Figure A2-5

Rev. 0 - Issued for Report - VA101-00246/06-5

WELL 2007 AJGW WELL LOGS.GPJ DRILL.GDT Dec 22, 08

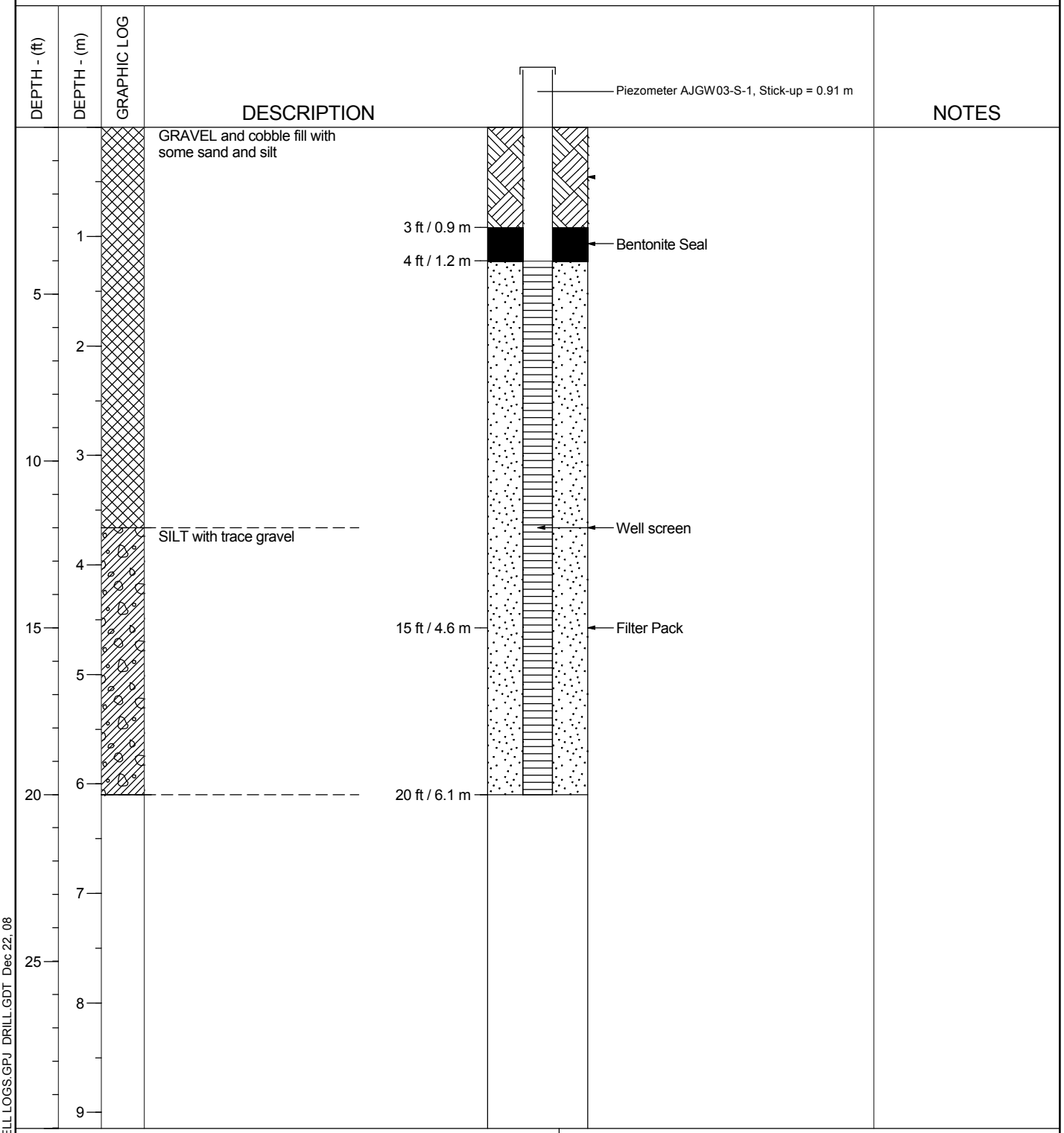
Project: AFTON MINE | Drill Hole No.: AJGW03-S | Page 1 of 1

Hole Depth: 85 ft / 25.9 m | Hole Diameter: 102 mm | Date Started: Sep 12, 07 | Date Completed: Sep 13, 07

Collar Elev: 894 ft / 272.5 m | PVC Pipe I.D.: 51 mm | Logged by: BG | Reviewed by:

Water Level Readings: Depth to Water / Date Measured

Well 1: / Sep 13, 07



ABACUS MINING AND EXPLORATION CORPORATION
AFTON MINE
Well Completion Details for AJGW03-S

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-246/06	5	0

Figure A2-6

Rev. 0 - Issued for Report - VA101-00246/06-5

WELL 2007 AJGW WELL LOGS.GPJ DRILL.GDT Dec 22, 08

M:\1\01\00246\06\A\DATA\HYDROGEOLOGY\GINT\2007 AJGW WELL LOGS.GPJ

Date Revised: Nov 16, 07

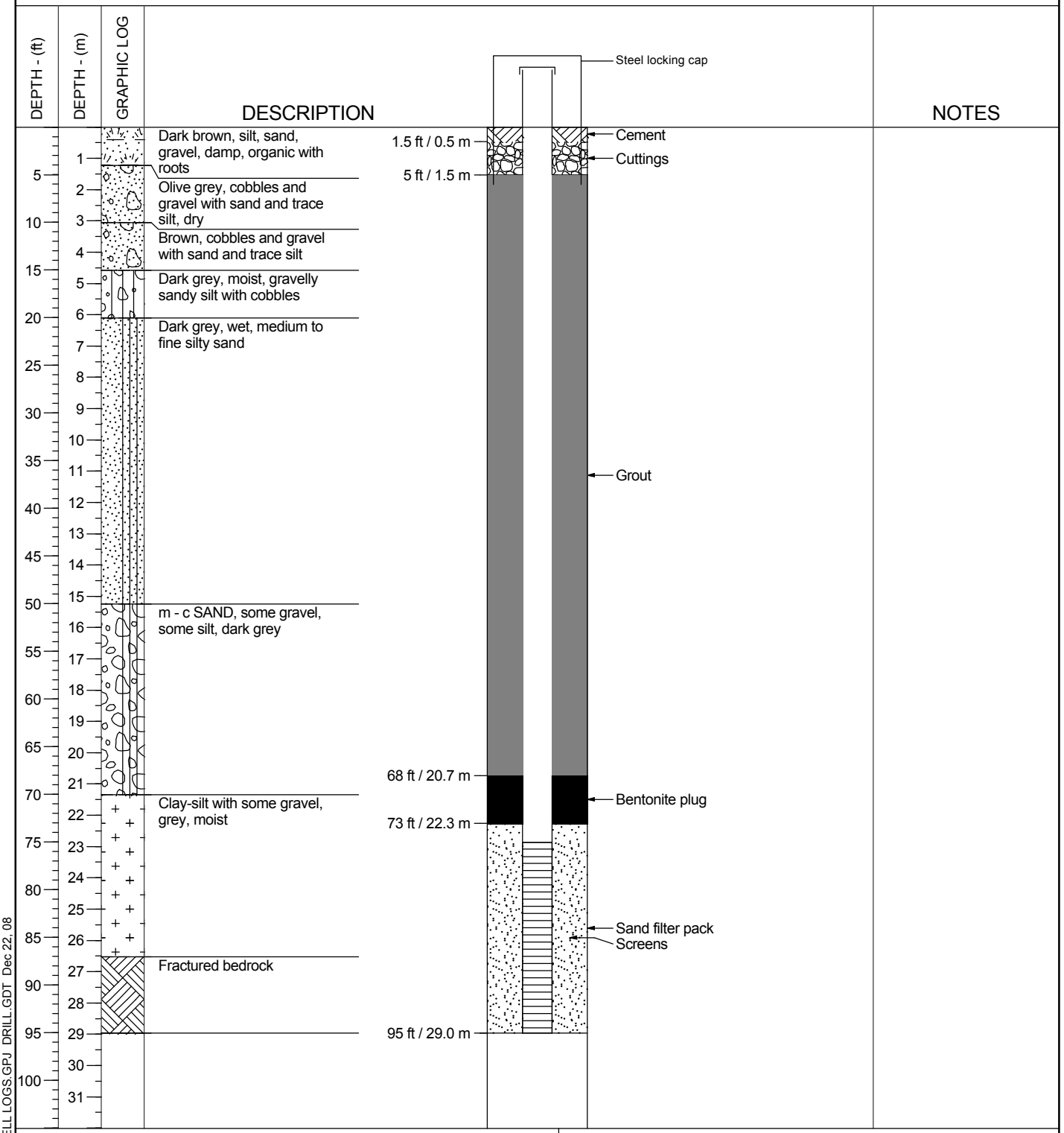
Project: AFTON MINE | Drill Hole No.: AJGW04- D | Page 1 of 1

Hole Depth: 95 ft / 29.0 m | Hole Diameter: 102 mm | Date Started: Apr 23, 08 | Date Completed: Apr 24, 08

Collar Elev: 903 ft / 275.2 m | PVC Pipe I.D.: 51 mm | Logged by: ALL | Reviewed by: BG

Water Level Readings: Depth to Water / Date Measured

Well 1: /



ABACUS MINING AND EXPLORATION CORPORATION
AFTON MINE
Well Completion Details for AJGW04- D

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-246/06	5	0

Figure A2-7

Rev. 0 - Issued for Report VA101-00246/06-5

WELL 2008 AJGW WELL LOGS.GPJ DRILL.GDT Dec 22, 08

M:\1\01\00246\06\A\DATA\HYDROGEOLOGY\GINT\2008 AJGW WELL LOGS.GPJ

Date Revised: May 7, 08

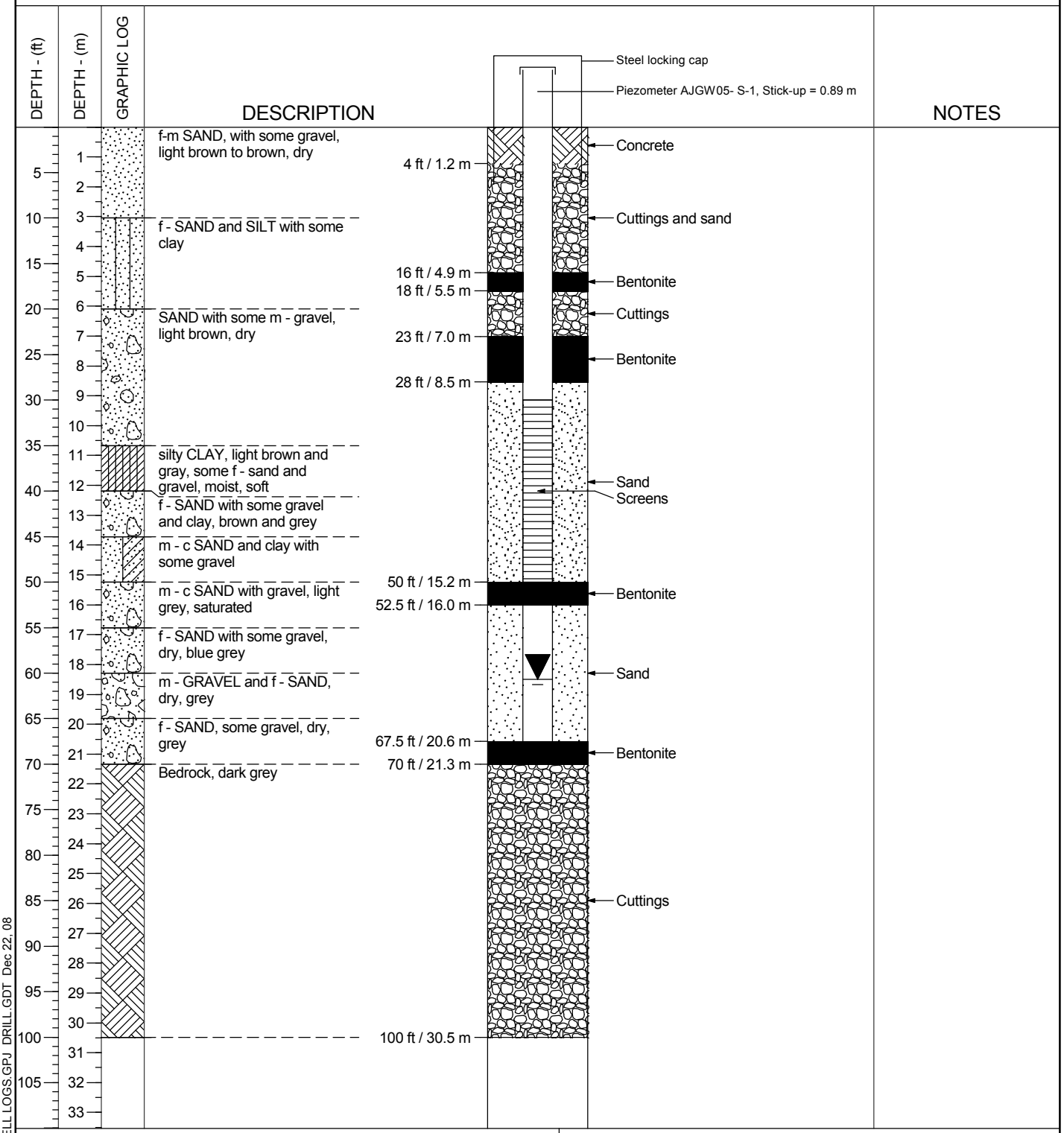
Project: AFTON MINE | Drill Hole No.: AJGW05- S | Page 1 of 1

Hole Depth: 100 ft / 30.5 m | Hole Diameter: 102 mm | Date Started: Apr 24, 08 | Date Completed: Apr 25, 08

Collar Elev: 904 ft / 275.5 m | PVC Pipe I.D.: 51 mm | Logged by: ALL | Reviewed by: BG

Water Level Readings: Depth to Water / Date Measured

Well 1: 18.50 / Apr 26, 08



ABACUS MINING AND EXPLORATION CORPORATION
AFTON MINE
Well Completion Details for AJGW05- S

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-246/06	5	0

Figure A2-8

Rev. 0 - Issued for Report VA101-00246/06-5

WELL 2008 AJGW WELL LOGS.GPJ DRILL.GDT Dec 22, 08

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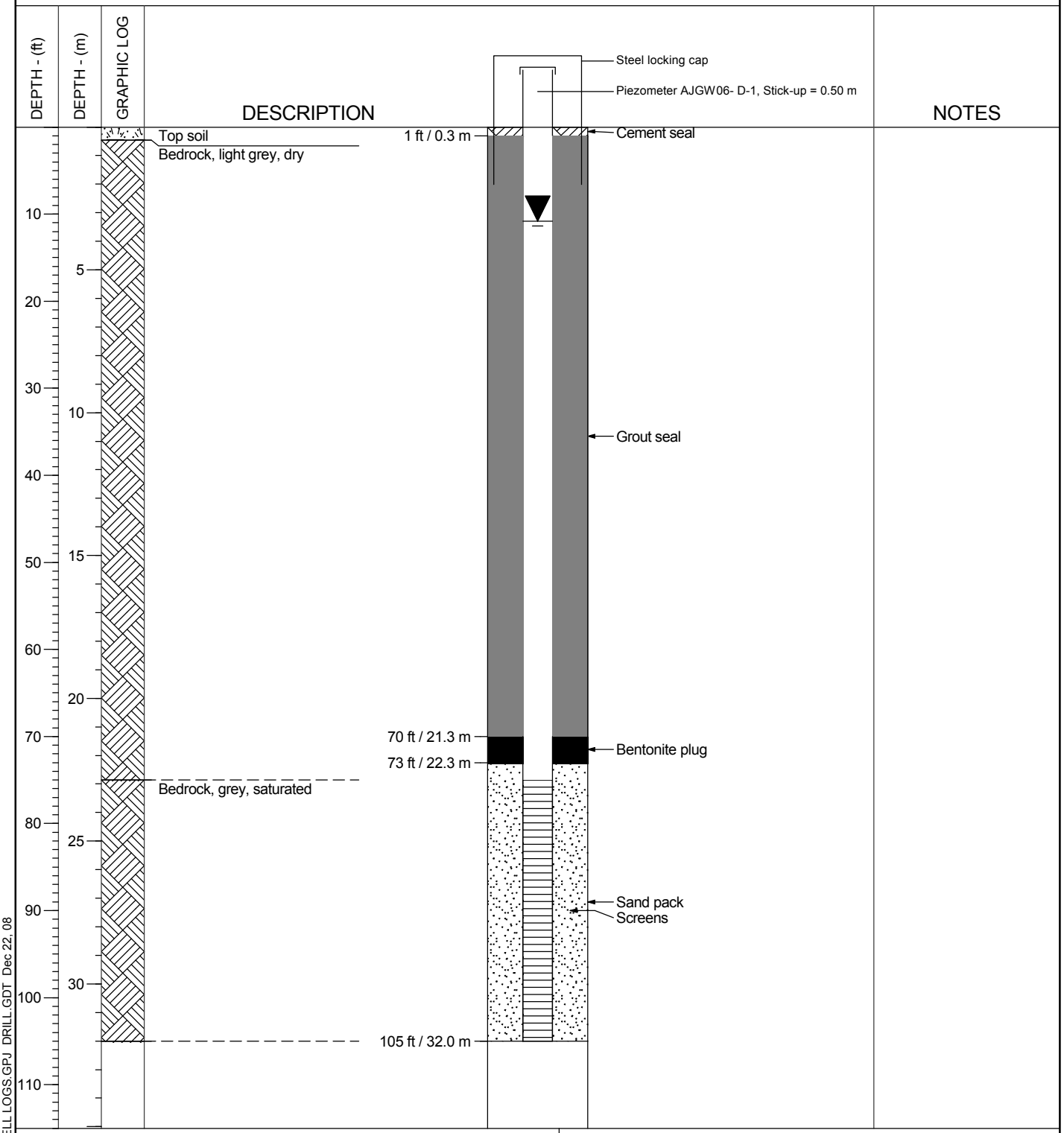
Date Revised: May 6, 08

Project:	**AFTON MINE**			Drill Hole No.:	**AJGW06- D**	Page	**1 of 1**
Hole Depth:	**105 ft / 32.0 m**	Hole Diameter:	**102 mm**	Date Started:	**Apr 25, 08**	Date Completed:	**Apr 26, 08**
Collar Elev:	**903 ft / 275.2 m**	PVC Pipe I.D.:	**51 mm**	Logged by:	**ALL**	Reviewed by:	**BG**

Water Level Readings: Depth to Water / Date Measured

Well 1: 3.29 / Apr 26, 08



ABACUS MINING AND EXPLORATION CORPORATION
AFTON MINE
Well Completion Details for AJGW06- D

Project No.	Ref. No.	Rev.
101-246/06	5	0

Figure A2-9

Rev. 0 - Issued for Report VA101-00246/06-5

WELL 2008 AJGW WELL LOGS.GPJ DRILL.GDT Dec 22, 08

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Date Revised: May 7, 08

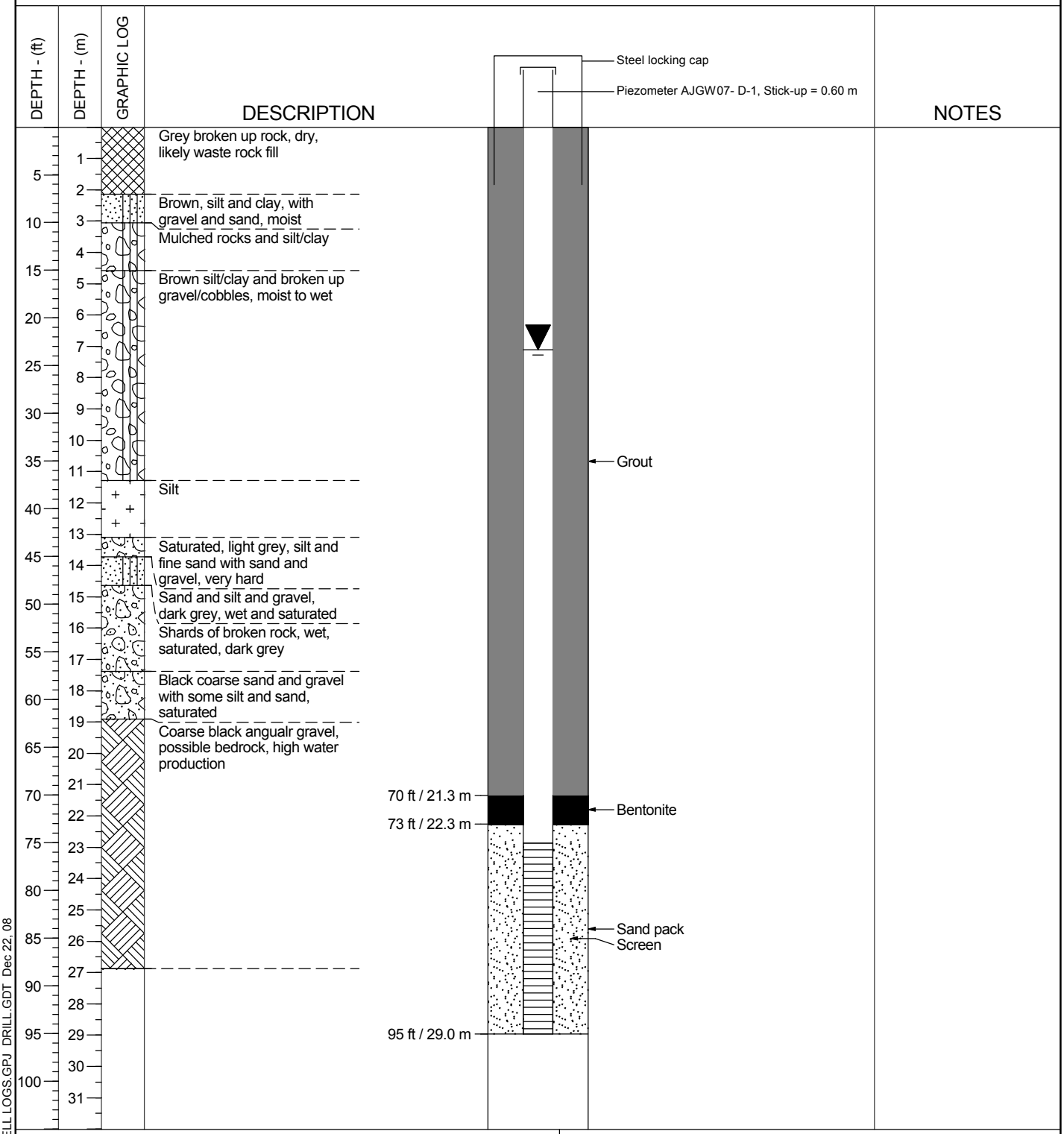
Project: AFTON MINE | Drill Hole No.: AJGW07- D | Page 1 of 1

Hole Depth: 95 ft / 29.0 m | Hole Diameter: 102 mm | Date Started: Apr 26, 08 | Date Completed: Apr 26, 08

Collar Elev: 905 ft / 275.8 m | PVC Pipe I.D.: 51 mm | Logged by: ALL | Reviewed by: BG

Water Level Readings: Depth to Water / Date Measured

Well 1: 7.11 / Apr 27, 08



ABACUS MINING AND EXPLORATION CORPORATION
AFTON MINE
Well Completion Details for AJGW07- D

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-246/06	5	0

Figure A2-10

Rev. 0 - Issued for Report VA101-00246/06-5

WELL 2008 AJGW WELL LOGS.GPJ DRILL.GDT Dec 22, 08

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Date Revised: May 7, 08

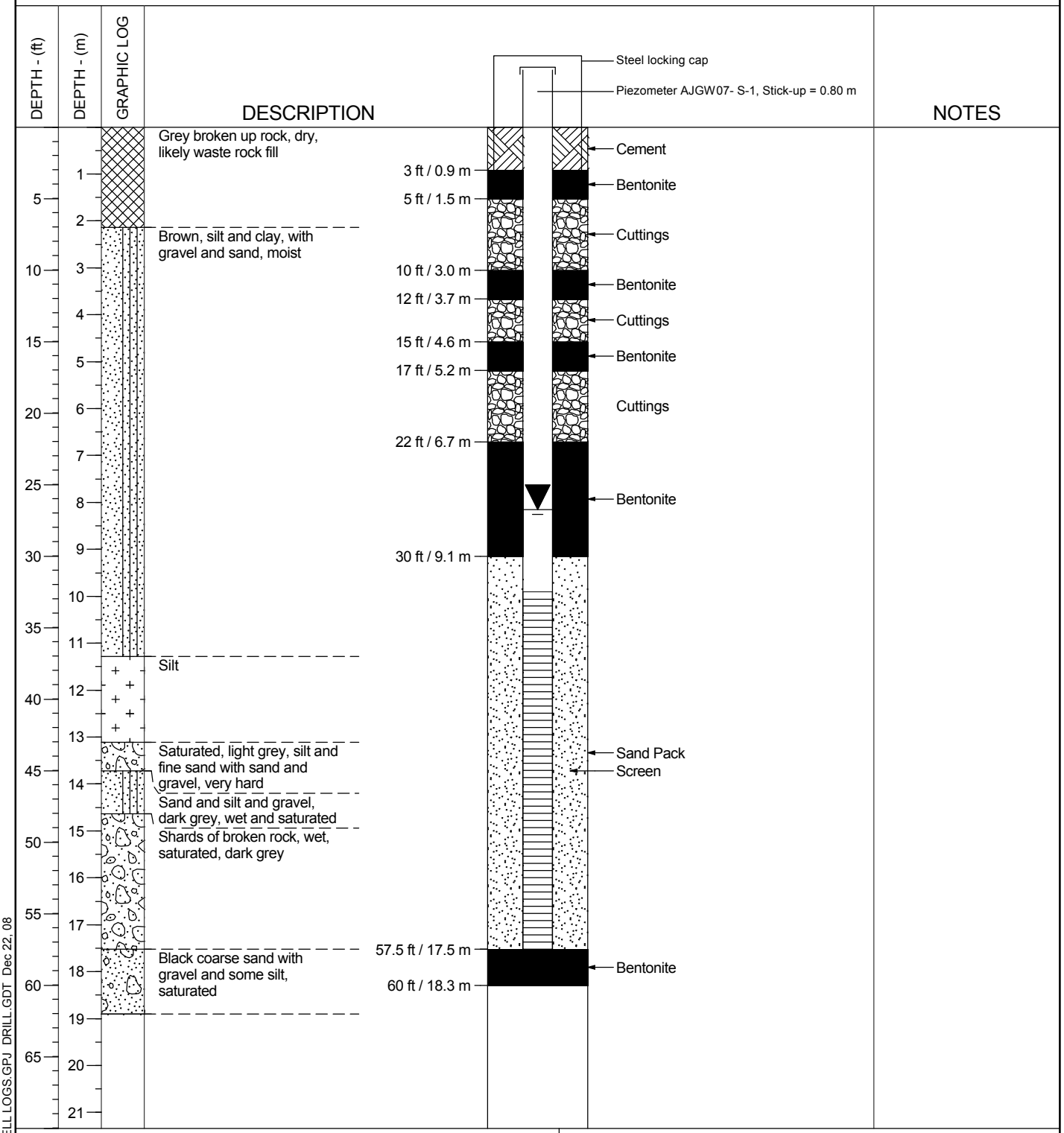
Project: AFTON MINE | Drill Hole No.: AJGW07- S | Page 1 of 1

Hole Depth: 95 ft / 29.0 m | Hole Diameter: 102 mm | Date Started: Apr 27, 08 | Date Completed: Apr 27, 08

Collar Elev: 905 ft / 275.8 m | PVC Pipe I.D.: 51 mm | Logged by: ALL | Reviewed by: BG

Water Level Readings: Depth to Water / Date Measured

Well 1: 8.15 / Apr 27, 08



ABACUS MINING AND EXPLORATION CORPORATION
AFTON MINE
Well Completion Details for AJGW07- S

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-246/06	5	0

Figure A2-11

Rev. 0 - Issued for Report VA101-00246/06-5

WELL 2008 AJGW WELL LOGS.GPJ DRILL.GDT Dec 22, 08

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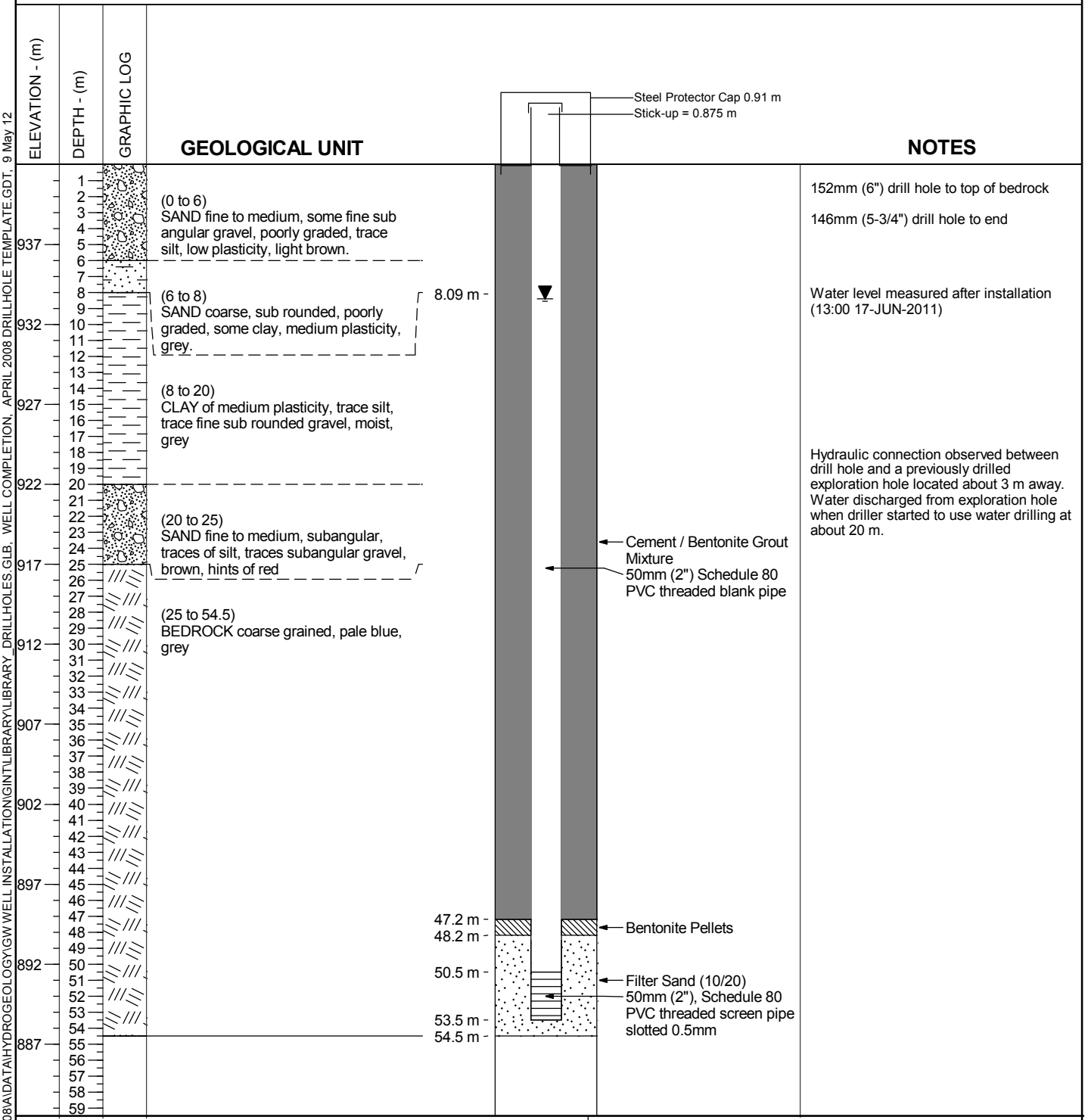
Date Revised: May 7, 08

Project:	**AJAX PROJECT**	Drill Hole No.	**MW11-01D**	**PAGE**	1 of 1
Contractor:	**JR DRILLING LTD**	Sample Type:	**Cuttings**	Date Drilling:	**16-JUN-2011**
Location:	**North of Proposed TSF**	Total Depth:	**54.5 m**	Date Installation:	**17-JUN-2011**
Coordinates:	**5,612,463 N , 679,733 E (UTM / NAD 83)**	Elevation:	**942 m**	Supervised by:	**AM**
Drilling Method:	**Air Rotary**			Reviewed by:	**CHS**



GENERAL REMARKS:

KGHM AJAX MINING INC.
AJAX PROJECT
MONITORING WELL DETAILS FOR MW11-01D

REV. 0 - Issued for Report

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF. NO.
VA101-246/8	3
FIGURE. 1	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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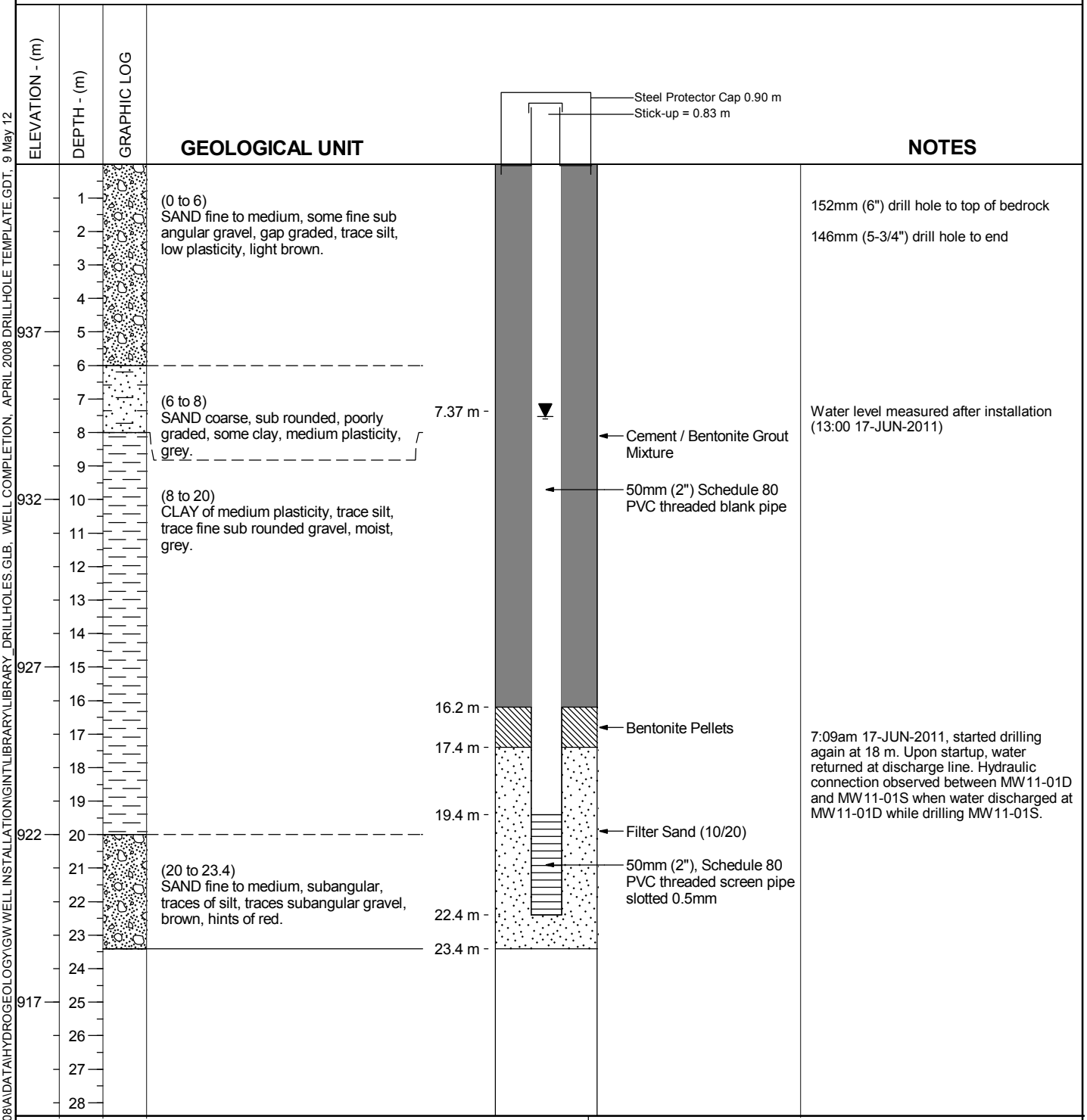
Project:	**AJAX PROJECT**	Drill Hole No.	**MW11-01S**	**PAGE**	1 of 1
Contractor:	**JR DRILLING LTD**	Sample Type:	**Cuttings**	Date Drilling:	**16-JUN-2011**
Location:	**North of Proposed TSF**	Total Depth:	**23.4 m**	Date Installation:	**17-JUN-2011**
Coordinates:	**5,612,460 N , 679,734 E (UTM / NAD 83)**	Elevation:	**942 m**	Supervised by:	**AM**
Drilling Method:	**Air Rotary**			Reviewed by:	**CHS**



GENERAL REMARKS:

REV. 0 - Issued for Report

KGHM AJAX MINING INC.
AJAX PROJECT
MONITORING WELL DETAILS FOR MW11-01S

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF. NO.
VA101-246/8	3
FIGURE. 2	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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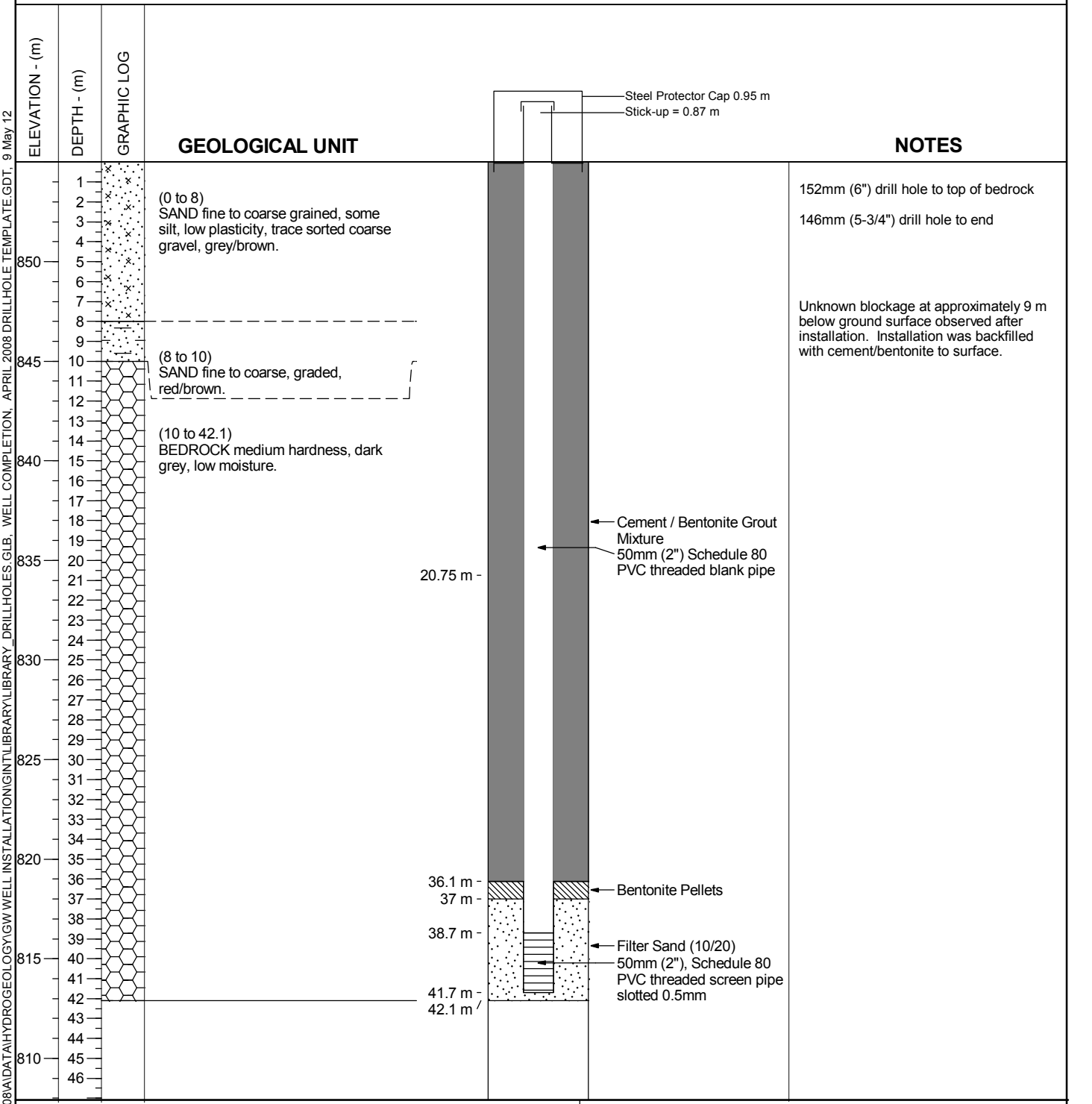
Project:	**AJAX PROJECT**	Drill Hole No.	****DH11-02**	**PAGE**	1 of 1
Contractor:	**JR DRILLING LTD**	Sample Type:	**Cuttings**	Date Drilling:	**17-JUN-2011**
Location:	**East of Proposed TSF**	Total Depth:	**42.1 m**	Date Installation:	**18-JUN-2011**
Coordinates:	**5,610,458 N , 680,496 E (UTM / NAD 83)**	Elevation:	**855 m**	Supervised by:	**AM**
Drilling Method:	**Air Rotary**			Reviewed by:	**CHS**



GENERAL REMARKS:

**Unknown blockage at approximately 9 m below ground surface observed after installation. Installation was backfilled with cement/bentonite to surface.

REV. 0 - Issued for Report

KGHM AJAX MINING INC.
AJAX PROJECT
MONITORING WELL DETAILS FOR **DH11-02

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF. NO.
VA101-246/8	3
FIGURE. 3	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT | Drill Hole No. **MW11-02** | PAGE 1 of 1

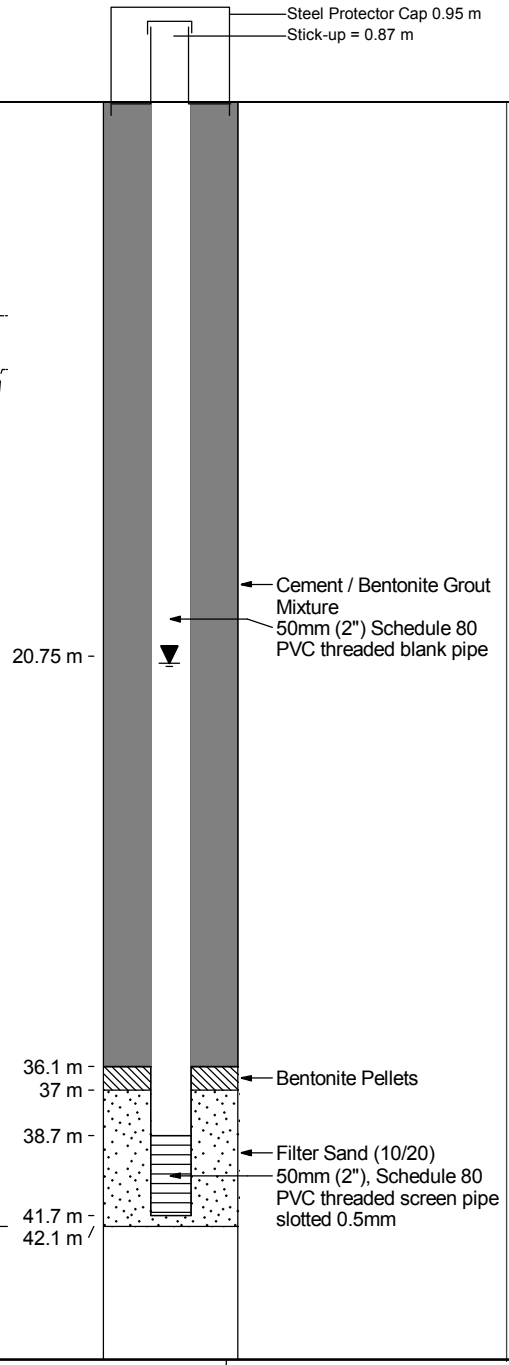
Contractor: **JR DRILLING LTD** | Sample Type: **Cuttings** | Date Drilling: **18-JUN-2011**

Location: **East of Proposed TSF** | Total Depth: **42.1 m** | Date Installation: **19-JUN-2011**

Coordinates: **5,610,459 N , 680,492 E (UTM / NAD 83)** | Elevation: **855 m** | Supervised by: **AM**

Drilling Method: **Air Rotary** | Reviewed by: **CHS**

ELEVATION - (m)	DEPTH - (m)	GRAPHIC LOG	GEOLOGICAL UNIT
850	1–8		(0 to 8) SAND fine to coarse grained, some silt, low plasticity, trace poorly graded coarse gravel, grey/brown.
845	8–12		(8 to 10) SAND fine to coarse, graded, red/brown.
840	10–42.1		(10 to 42.1) BEDROCK medium hard, dark grey, low moisture.
835			
830			
825			
820			
815			
810			



NOTES

152mm (6") drill hole to top of bedrock

146mm (5-3/4") drill hole to end

Water level measured after installation (13:00 19-JUN-2011)

GENERAL REMARKS:

REV. 0 - Issued for Report

KGHM AJAX MINING INC.
AJAX PROJECT
MONITORING WELL DETAILS FOR MW11-02

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. VA101-246/8 | REF. NO. 3

FIGURE. 3 | REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT | Drill Hole No. **MW11-03D** | PAGE 1 of 1

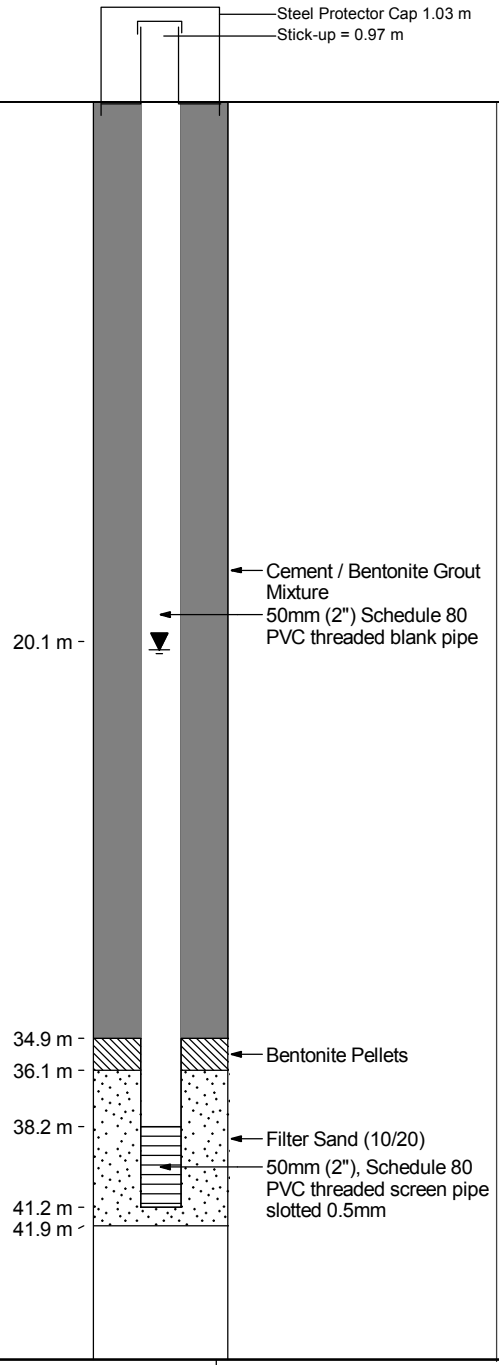
Contractor: JR DRILLING LTD | Sample Type: Cuttings | Date Drilling: 19-JUN-2011

Location: West of Proposed TSF | Total Depth: 41.9 m | Date Installation: 19/20-JUN-2011

Coordinates: 5,611,335 N , 678,802 E (UTM / NAD 83) | Elevation: 814 m | Supervised by: AM

Drilling Method: Air Rotary | Reviewed by: CHS

ELEVATION - (m)	DEPTH - (m)	GRAPHIC LOG	GEOLOGICAL UNIT
	1–4		(0 to 2.5) SILT of low plasticity, some sand, fine, subrounded, compact, poorly graded.
809	5–9		(2.5 to 9) SAND fine to coarse, graded, some fine gravel, subangular to subrounded, grey/brown, trace of clay, low plasticity.
804	10–17		(9 to 17) SAND coarse and fine GRAVEL, sand rounded, gravel subangular, moderately graded, some clay, medium plasticity.
799	15–17		
	17–21		(17 to 21) CLAY/SILT Medium plasticity, trace sand/gravel, well graded, subrounded, moist.
794	20–21		
789	21–41.9		(21 to 41.9) BEDROCK soft, volcanic, low moisture, varying layers of colour alternating between red and grey.
784	30–41		
779	35–41		
774	40–41		
769	45–46		



NOTES

152mm (6") drill hole to top of bedrock

146mm (5-3/4") drill hole to end

Water level measured after installation (13:00 20-JUN-2011).

GENERAL REMARKS:

REV. 0 - Issued for Report

KGHM AJAX MINING INC.
AJAX PROJECT
MONITORING WELL DETAILS FOR MW11-03D

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. VA101-246/8 | REF. NO. 3

FIGURE. 4 | REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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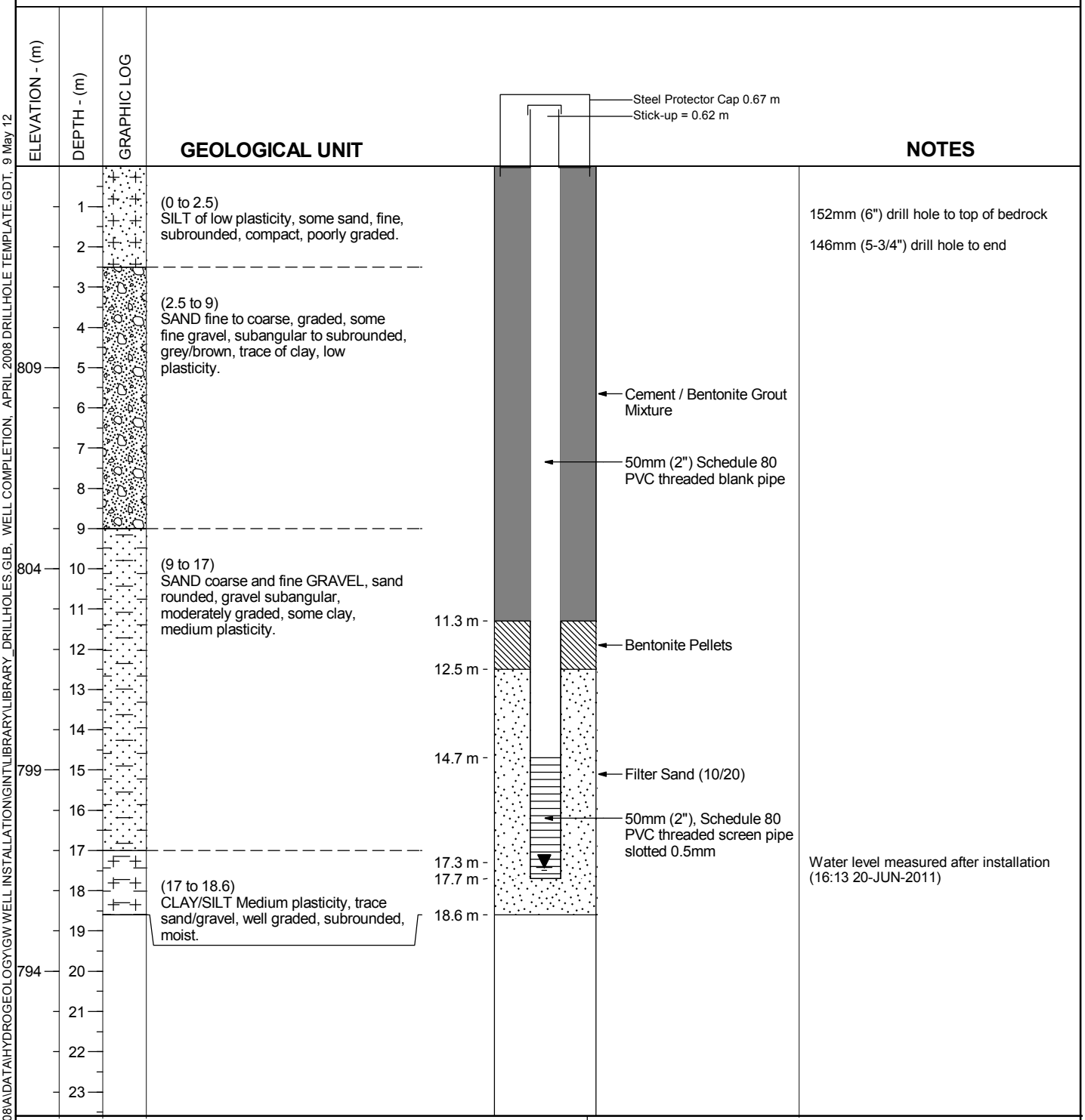
Project: AJAX PROJECT | Drill Hole No. **MW11-03S** | PAGE 1 of 1

Contractor: JR DRILLING LTD | Sample Type: Cuttings | Date Drilling: 20-JUN-2011

Location: West of Proposed TSF | Total Depth: 18.6 m | Date Installation: 20-JUN-2011

Coordinates: 5,611,337 N , 678,805 E (UTM / NAD 83) | Elevation: 814 m | Supervised by: AM

Drilling Method: Air Rotary | Reviewed by: CHS



GENERAL REMARKS:

REV. 0 - Issued for Report

KGHM AJAX MINING INC.
AJAX PROJECT
MONITORING WELL DETAILS FOR MW11-03S

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. VA101-246/8 | REF. NO. 3

FIGURE. 5 | REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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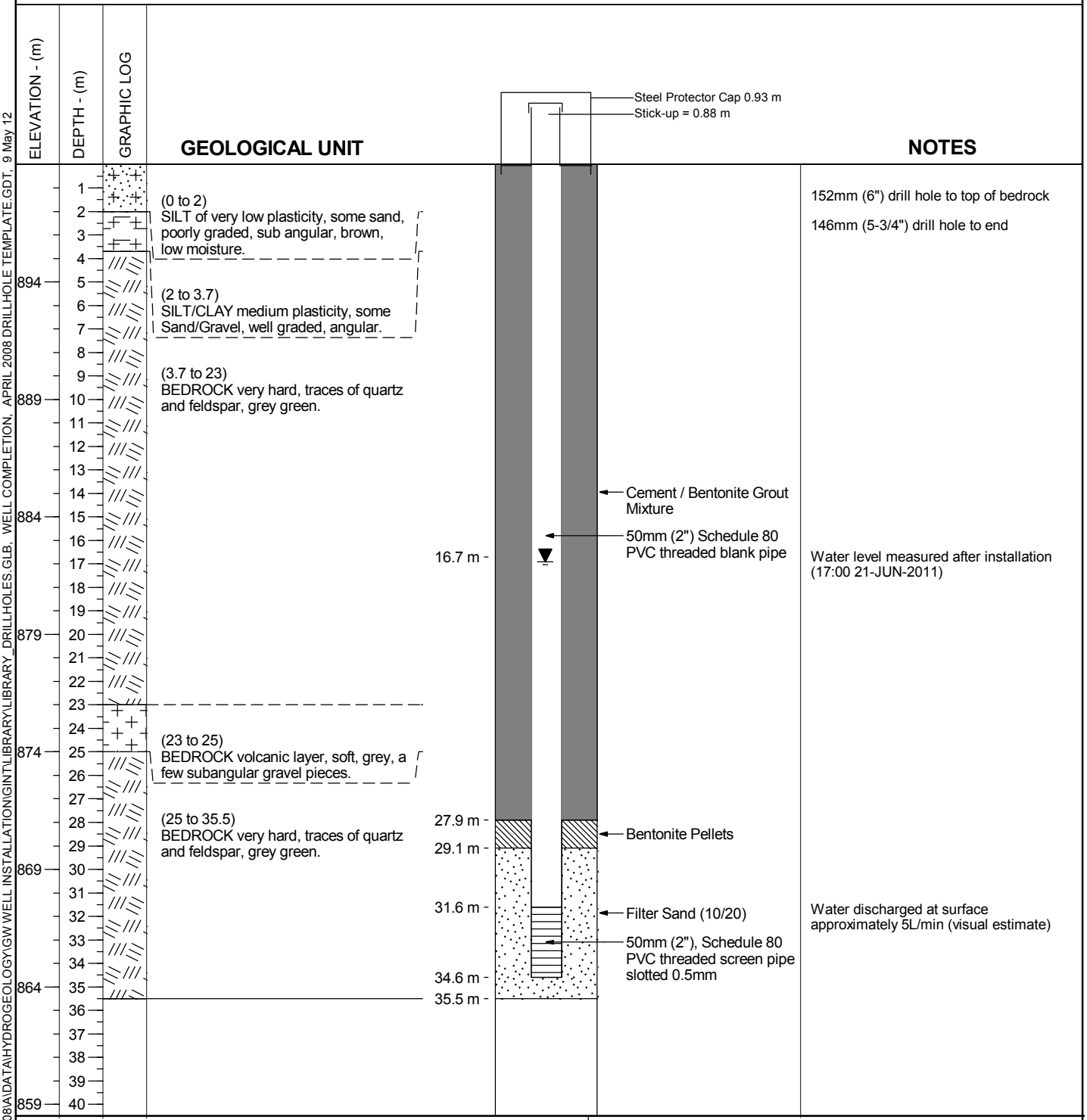
Project: AJAX PROJECT | Drill Hole No. **MW11-04D** | PAGE 1 of 1

Contractor: JR DRILLING LTD | Sample Type: Cuttings | Date Drilling: 21-JUN-2011

Location: West of Proposed Pit/North of Jacko Lake | Total Depth: 35.5 m | Date Installation: 21-JUN-2011

Coordinates: 5,610,364 N , 682,617 E (UTM / NAD 83) | Elevation: 899 m | Supervised by: AM

Drilling Method: Air Rotary | Reviewed by: CHS



GENERAL REMARKS:

REV. 0 - Issued for Report

KGHM AJAX MINING INC.
AJAX PROJECT
MONITORING WELL DETAILS FOR MW11-04D

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. VA101-246/8 | REF. NO. 3

FIGURE. 6 | REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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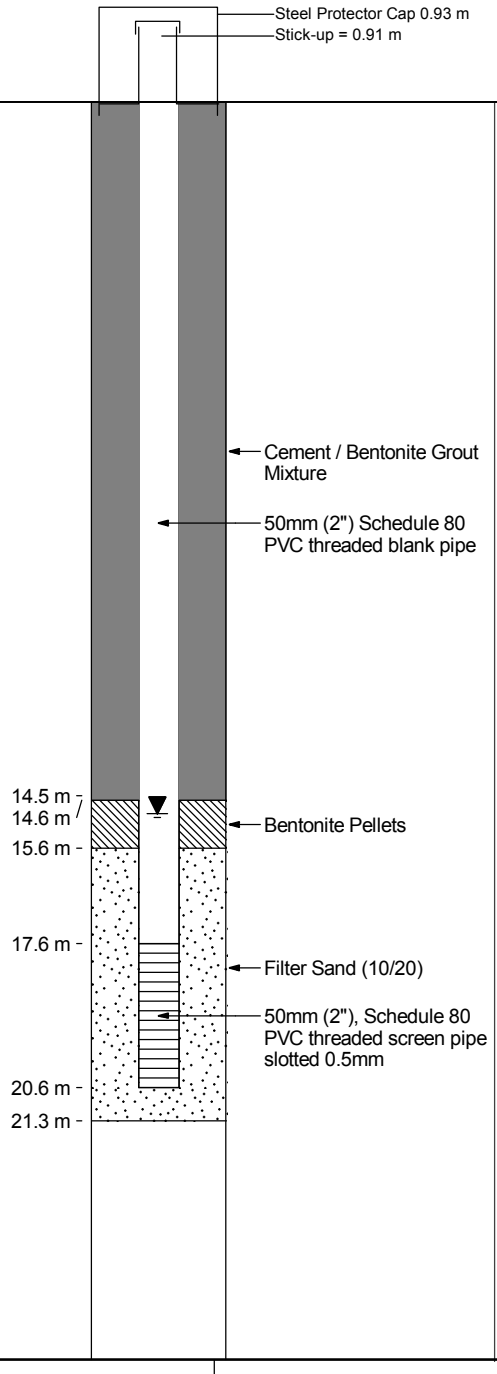
Project:	**AJAX PROJECT**	Drill Hole No.	**MW11-04S**	**PAGE**	1 of 1
Contractor:	**JR DRILLING LTD**	Sample Type:	**Cuttings**	Date Drilling:	**21-JUN-2011**
Location:	**West of Proposed Pit/North of Jacko Lake**	Total Depth:	**21.3 m**	Date Installation:	**21-JUN-2011**
Coordinates:	**5,610,367 N , 682,619 E (UTM / NAD 83)**	Elevation:	**898 m**	Supervised by:	**AM**
Drilling Method:	**Air Rotary**			Reviewed by:	**CHS**

ELEVATION - (m)	DEPTH - (m)	GRAPHIC LOG	GEOLOGICAL UNIT
	1		(0 to 2) SILT of very low plasticity, some sand, poorly graded, sub angular, brown, low moisture.
	2		
	3		
	4		(2 to 3.7) SILT/CLAY medium plasticity, some Sand/Gravel, well graded, angular.
893	5		
	6		(3.7 to 21.3) BEDROCK very hard, traces of quartz and feldspar, grey green.
	7		
	8		
	9		
888	10		
	11		
	12		
	13		
	14		
883	15		
	16		
	17		
	18		
	19		
878	20		
	21		
	22		
	23		
	24		
873	25		
	26		



NOTES

152mm (6") drill hole to top of bedrock

146mm (5-3/4") drill hole to end

Water level measured pre development (08-JUL-2011).

GENERAL REMARKS:

KGHM AJAX MINING INC.
AJAX PROJECT
MONITORING WELL DETAILS FOR MW11-04S

REV. 0 - Issued for Report

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF. NO.
VA101-246/8	3
FIGURE. 7	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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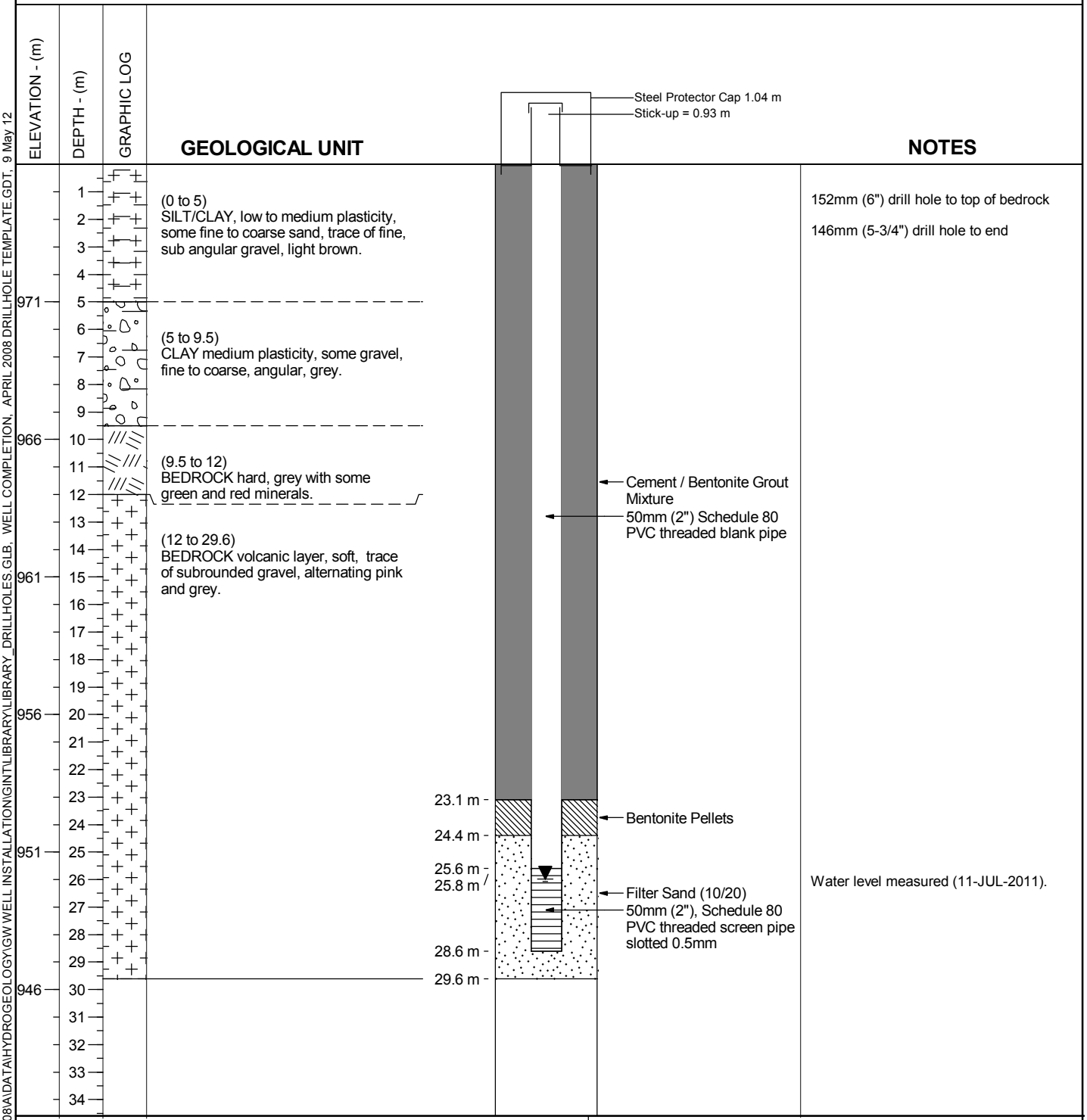
Project:	**AJAX PROJECT**	Drill Hole No.	**MW11-05D**	**PAGE**	1 of 1
Contractor:	**JR DRILLING LTD**	Sample Type:	**Cuttings**	Date Drilling:	**22-JUN-2011**
Location:	**North of East Waste Rock Facility**	Total Depth:	**29.6 m**	Date Installation:	**22-JUN-2011**
Coordinates:	**5,610,692 N , 686,723 E (UTM / NAD 83)**	Elevation:	**976 m**	Supervised by:	**AM**
Drilling Method:	**Air Rotary**			Reviewed by:	**CHS**



GENERAL REMARKS:

KGHM AJAX MINING INC.
AJAX PROJECT
MONITORING WELL DETAILS FOR MW11-05D

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF. NO.
VA101-246/8	3
FIGURE. 8	REV. 0

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Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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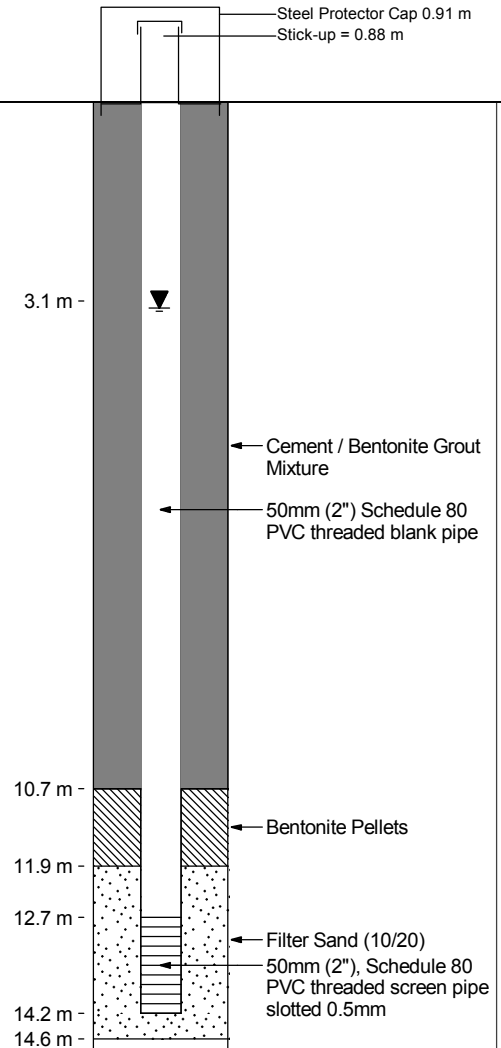
Project:	**AJAX PROJECT**	Drill Hole No.	**MW11-05S**	**PAGE**	1 of 1
Contractor:	**JR DRILLING LTD**	Sample Type:	**Cuttings**	Date Drilling:	**22-JUN-2011**
Location:	**North of East Waste Rock Facility**	Total Depth:	**14.6 m**	Date Installation:	**22-JUN-2011**
Coordinates:	**5,610,689 N , 686,723 E (UTM / NAD 83)**	Elevation:	**976 m**	Supervised by:	**AM**
Drilling Method:	**Air Rotary**			Reviewed by:	**CHS**

ELEVATION - (m)	DEPTH - (m)	GRAPHIC LOG	GEOLOGICAL UNIT
	1		(0 to 5) SILT/CLAY, low to medium plasticity, some fine to coarse sand, trace of fine, sub angular gravel, light brown.
	2		
	3		
	4		
971	5		
	6		(5 to 9.5) CLAY medium plasticity, some fine to coarse, angular gravel, grey.
	7		
	8		
	9		
966	10		(9.5 to 12) BEDROCK hard, grey with some green and red minerals.
	11		
	12		
	13		(12 to 14.6) BEDROCK volcanic layer, soft, trace of subrounded gravel, alternating pink and grey
	14		
961	15		
	16		
	17		
	18		
	19		



NOTES

152mm (6") drill hole to top of bedrock

146mm (5-3/4") drill hole to end

Water level measured (11-JUL-2011).

GENERAL REMARKS:

REV. 0 - Issued for Report

KGHM AJAX MINING INC.
AJAX PROJECT
MONITORING WELL DETAILS FOR MW11-05S

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF. NO.
VA101-246/8	3
FIGURE. 9	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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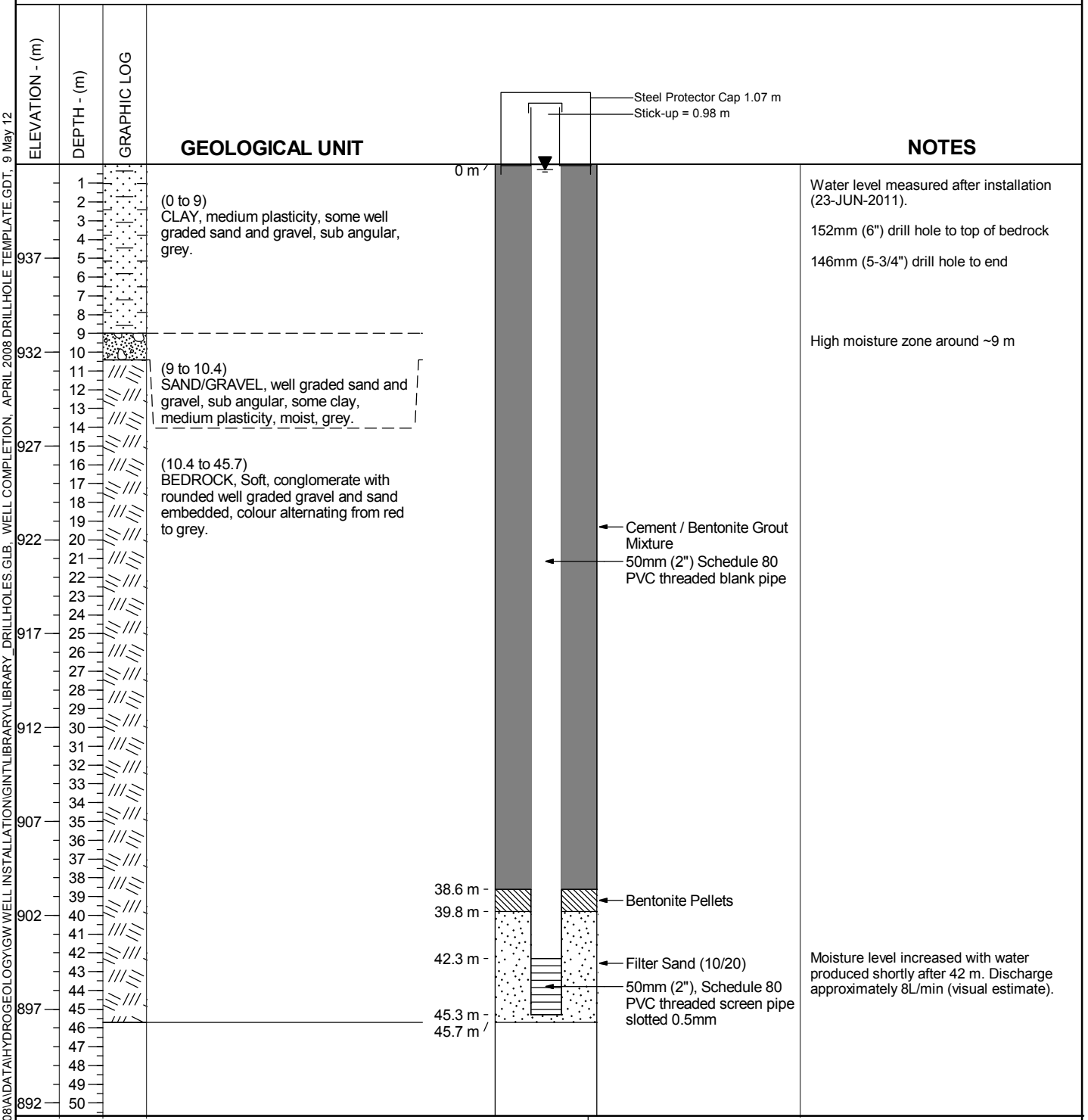
Project: AJAX PROJECT | Drill Hole No. **MW11-06D** | PAGE 1 of 1

Contractor: JR DRILLING LTD | Sample Type: Cuttings | Date Drilling: 23-JUN-2011

Location: North East Side of North Waste Rock Facility | Total Depth: 45.7 m | Date Installation: 23-JUN-2011

Coordinates: 5,612,236 N , 683,405 E (UTM / NAD 83) | Elevation: 942 m | Supervised by: AM

Drilling Method: Air Rotary | Reviewed by: CHS



GENERAL REMARKS:

KGHM AJAX MINING INC.
AJAX PROJECT
MONITORING WELL DETAILS FOR MW11-06D

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. VA101-246/8 | REF. NO. 3

FIGURE. 10 | REV. 0

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Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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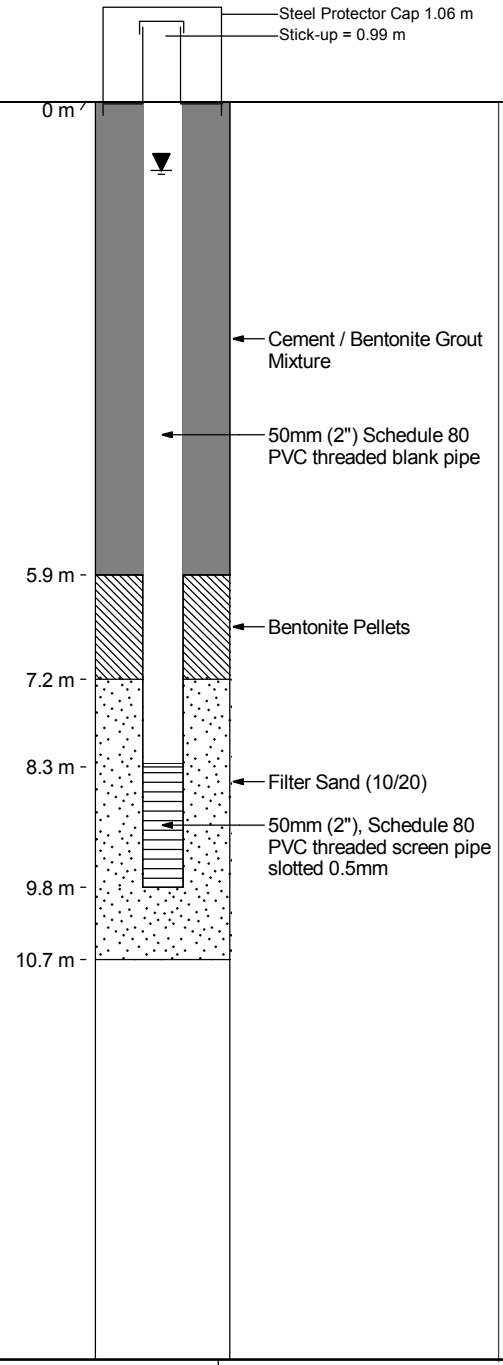
Project:	**AJAX PROJECT**	Drill Hole No.	**MW11-06S**	**PAGE**	1 of 1
Contractor:	**JR DRILLING LTD**	Sample Type:	**Cuttings**	Date Drilling:	**23-JUN-2011**
Location:	**North East Side of North Waste Rock Facility**	Total Depth:	**10.7 m**	Date Installation:	**24-JUN-2011**
Coordinates:	**5,612,239 N , 683,404 E (UTM / NAD 83)**	Elevation:	**942 m**	Supervised by:	**AM**
Drilling Method:	**Air Rotary**			Reviewed by:	**CHS**

ELEVATION - (m)	DEPTH - (m)	GRAPHIC LOG	GEOLOGICAL UNIT	NOTES
937	1–5		(0 to 9) CLAY, medium plasticity, some well graded sand and gravel, sub angular, grey.	Water level measured after installation (24-JUN-2011).
				152mm (6") drill hole to top of bedrock
				146mm (5-3/4") drill hole to end
932	9–10		(9 to 10.7) SAND/GRAVEL, well graded sand and gravel, sub angular, some clay, medium plasticity, moist, grey.	High moisture around ~9 m
927	15			



GENERAL REMARKS:

REV. 0 - Issued for Report

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

KGHM AJAX MINING INC.
AJAX PROJECT
MONITORING WELL DETAILS FOR MW11-06S

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PROJECT/ASSIGNMENT NO.	REF. NO.
VA101-246/8	3
FIGURE. 11	REV. 0

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Project:	**AJAX PROJECT**	Drill Hole No.	**MW11-07D**	**PAGE**	1 of 1
Contractor:	**JR DRILLING LTD**	Sample Type:	**Cuttings**	Date Drilling:	**24-JUN-2011**
Location:	**North Side of North Waste Rock Facility**	Total Depth:	**51.8 m**	Date Installation:	**24-JUN-2011**
Coordinates:	**5,612,893 N , 681,751 E (UTM / NAD 83)**	Elevation:	**913 m**	Supervised by:	**AM**
Drilling Method:	**Air Rotary**			Reviewed by:	**CHS**

ELEVATION - (m) | DEPTH - (m) | GRAPHIC LOG

GEOLOGICAL UNIT

Steel Protector Cap 0.90 m
Stick-up = 0.87 m

0.47 m

(0 to 1)
SAND/GRAVEL, well graded, till, angular, trace organics, brown.

(1 to 9.1)
BEDROCK, hard, very angular cuttings, grey, minerals and metals distributed throughout giving different colouring.

(9.1 to 45.7)
BEDROCK, Soft, conglomerate with rounded poorly sorted gravel and sand embedded, colour alternating from pink to grey.

Cement / Bentonite Grout Mixture

50mm (2") Schedule 80 PVC threaded blank pipe

44.5 m
45.1 m

Bentonite Pellets

47.9 m

Filter Sand (10/20)

50mm (2"), Schedule 80 PVC threaded screen pipe slotted 0.5mm

50.9 m
51.8 m

(45.7 to 51.8)
BEDROCK, medium hardness, conglomerate with poorly sorted gravel and sand embedded, colour alternating from pink to grey.

NOTES

Water level measured after installation (25-JUN-2011).

152mm (6") drill hole to top of bedrock

146mm (5-3/4") drill hole to end

Bedrock containing water ~4.5 m. Water returned at discharge line for 1-2 m and then returned to dry cuttings.

High moisture levels at ~13 m

10L/min discharge (visual estimate) starting at ~47 m.

GENERAL REMARKS:

REV. 0 - Issued for Report

KGHM AJAX MINING INC.
AJAX PROJECT
MONITORING WELL DETAILS FOR MW11-07D

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PROJECT/ASSIGNMENT NO. VA101-246/8 | REF. NO. 3
FIGURE. 12 | REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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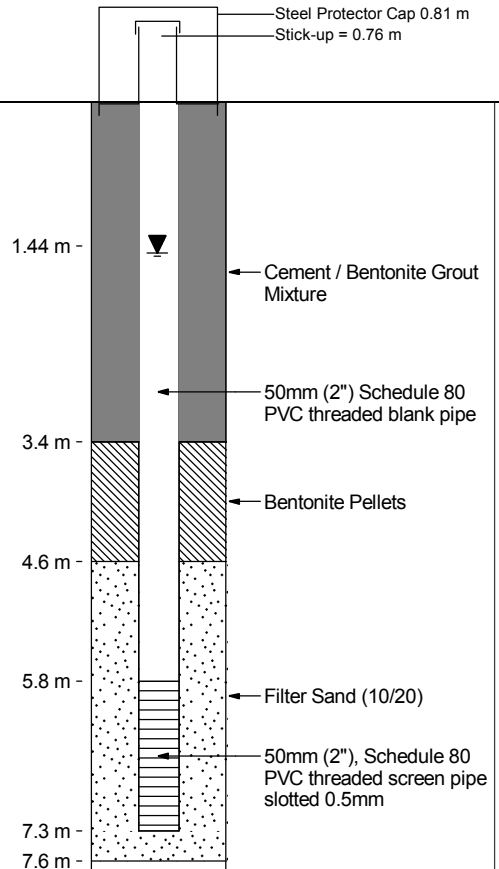
Project:	**AJAX PROJECT**	Drill Hole No.	**MW11-07S**	**PAGE**	1 of 1
Contractor:	**JR DRILLING LTD**	Sample Type:	**Cuttings**	Date Drilling:	**24-JUN-2011**
Location:	**North Side of North Waste Rock Facility**	Total Depth:	**7.6 m**	Date Installation:	**24-JUN-2011**
Coordinates:	**5,612,894 N , 681,750 E (UTM / NAD 83)**	Elevation:	**913 m**	Supervised by:	**AM**
Drilling Method:	**Air Rotary**			Reviewed by:	**CHS**

ELEVATION - (m) | DEPTH - (m) | GRAPHIC LOG

GEOLOGICAL UNIT

(0 to 1)
SAND/GRAVEL, well graded, till, angular, trace organics, brown.

(1 to 7.6)
BEDROCK, hard, very angular cuttings, grey, minerals and metals distributed throughout giving different colouring.



NOTES

152mm (6") drill hole to top of bedrock

146mm (5-3/4") drill hole to end

Water level measured after installation (25-JUN-2011).

Beginning at ~5 m, discharge approximately 2L/min.

GENERAL REMARKS:

REV. 0 - Issued for Report

KGHM AJAX MINING INC.
AJAX PROJECT
MONITORING WELL DETAILS FOR MW11-07S

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PROJECT/ASSIGNMENT NO.	REF. NO.
VA101-246/8	3
FIGURE. 13	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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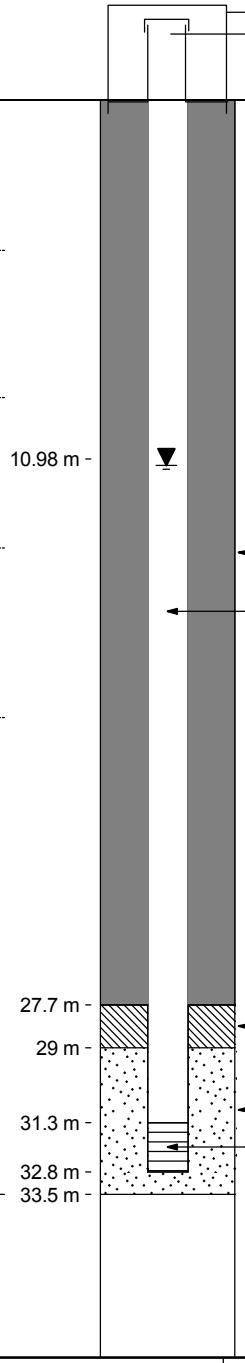
Project:	**AJAX PROJECT**	Drill Hole No.	**MW11-08D**	**PAGE**	1 of 1
Contractor:	**JR DRILLING LTD**	Sample Type:	**Cuttings**	Date Drilling:	**25-JUN-2011**
Location:	**South West of Jacko Lake**	Total Depth:	**33.5 m**	Date Installation:	**25-JUN-2011**
Coordinates:	**5,609,123 N , 681,390 E (UTM / NAD 83)**	Elevation:	**909 m**	Supervised by:	**AM**
Drilling Method:	**Air Rotary**			Reviewed by:	**CHS**

ELEVATION - (m)	DEPTH - (m)	GRAPHIC LOG	GEOLOGICAL UNIT
904	1–5		(0 to 4.6) SILT, of low plasticity, fine sand, subrounded, poorly graded, dry, low cohesiveness, brown.
	5–9		(4.6 to 9.1) SAND, fine to coarse, well graded, sub angular, some silt, low plasticity, trace fine gravel, angular, brown.
899	9–14		(9.1 to 13.7) SAND/GRAVEL, fine to coarse, well graded, angular, some clay, medium plasticity, grey.
894	14–19		(13.7 to 18.9) CLAY medium to high plasticity, trace silt, some well graded sand, angular, cohesive, moisture varies with depth, increased sand and moisture at lower depth.
889	19–33.5		(18.9 to 33.5) BEDROCK, medium hardness, grey green.
884			
879			
874			



NOTES

152mm (6") drill hole to top of bedrock

146mm (5-3/4") drill hole to end

Water level measured after installation (26-JUN-2011).

5L/min discharge (visual estimate) at ~32 m

GENERAL REMARKS:

REV. 0 - Issued for Report

KGHM AJAX MINING INC.
AJAX PROJECT
MONITORING WELL DETAILS FOR MW11-08D

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PROJECT/ASSIGNMENT NO.	REF. NO.
VA101-246/8	3
FIGURE. 14	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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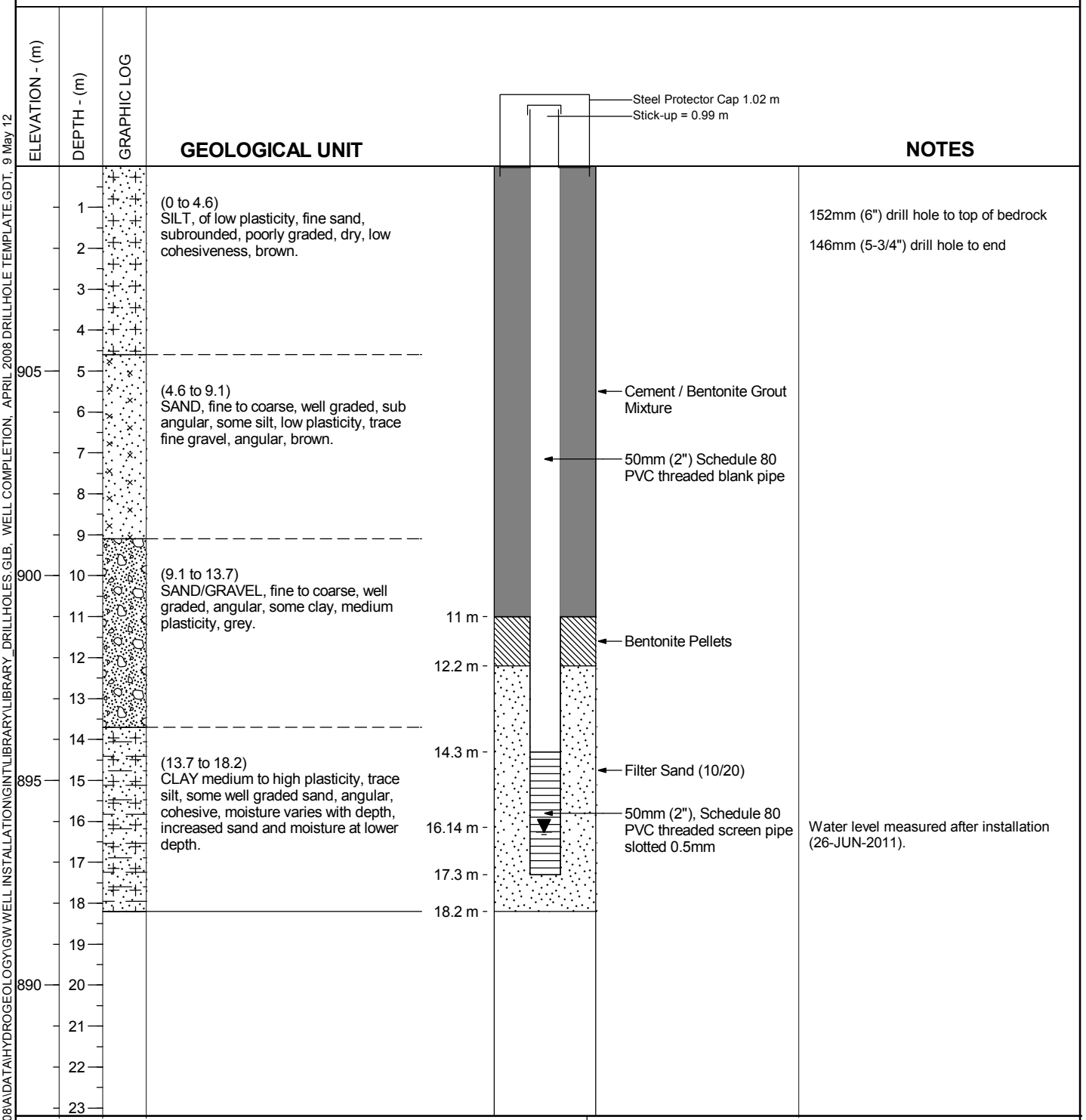
Project: AJAX PROJECT | Drill Hole No. **MW11-08S** | PAGE 1 of 1

Contractor: JR DRILLING LTD | Sample Type: Cuttings | Date Drilling: 25-JUN-2011

Location: South West of Jacko Lake | Total Depth: 18.2 m | Date Installation: 26-JUN-2011

Coordinates: 5,609,124 N , 681,385 E (UTM / NAD 83) | Elevation: 910 m | Supervised by: AM

Drilling Method: Air Rotary | Reviewed by: CHS



GENERAL REMARKS:

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KGHM AJAX MINING INC.
AJAX PROJECT
MONITORING WELL DETAILS FOR MW11-08S

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PROJECT/ASSIGNMENT NO. VA101-246/8 | REF. NO. 3

FIGURE. 15 | REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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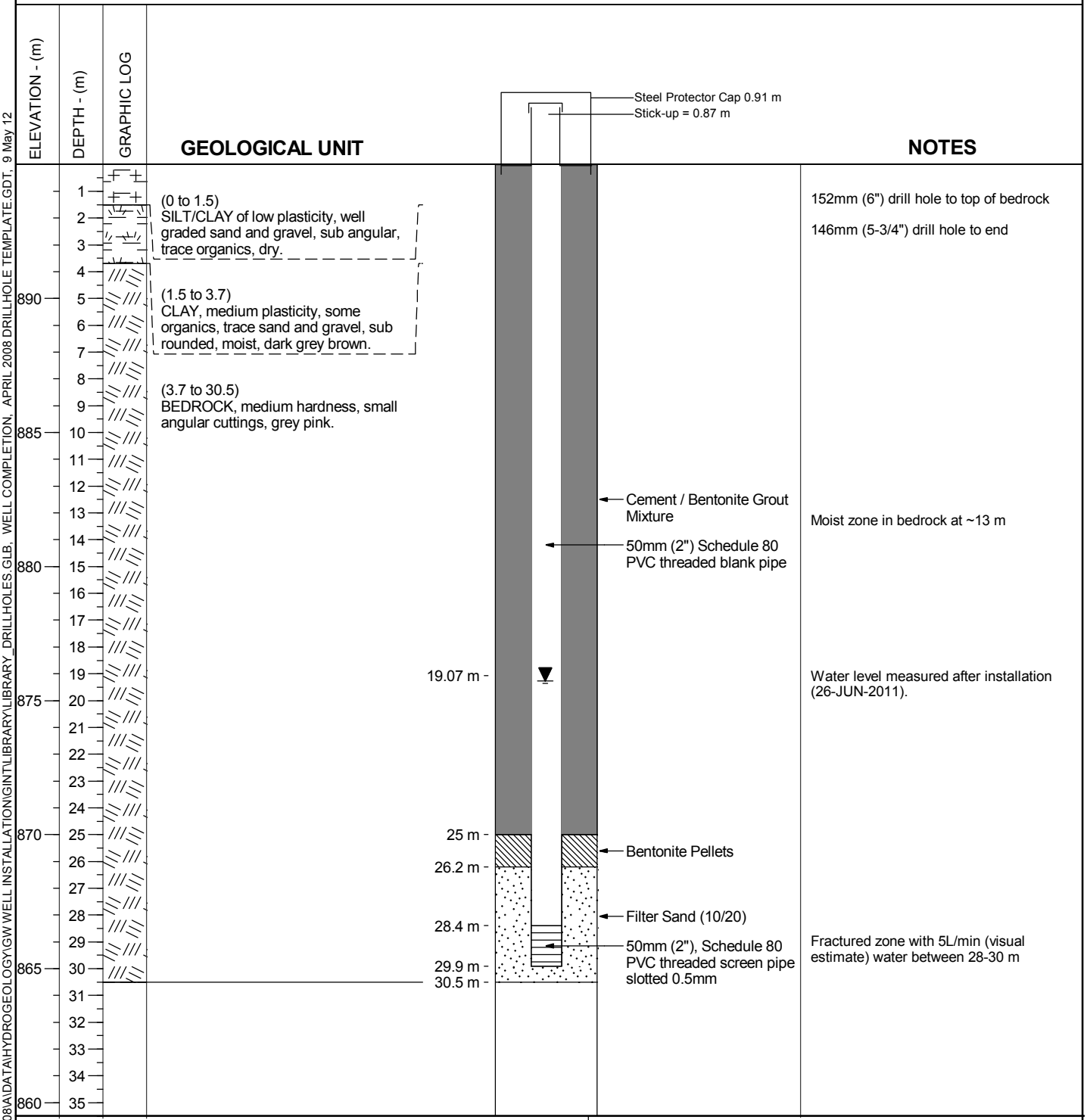
Project: AJAX PROJECT | Drill Hole No. **MW11-09D** | PAGE 1 of 1

Contractor: JR DRILLING LTD | Sample Type: Cuttings | Date Drilling: 26-JUN-2011

Location: South Side of Proposed TSF | Total Depth: 30.5 m | Date Installation: 26-JUN-2011

Coordinates: 5,609,076 N , 679,861 E (UTM / NAD 83) | Elevation: 895 m | Supervised by: AM

Drilling Method: Air Rotary | Reviewed by: CHS



GENERAL REMARKS:

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KGHM AJAX MINING INC.
AJAX PROJECT
MONITORING WELL DETAILS FOR MW11-09D

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PROJECT/ASSIGNMENT NO. VA101-246/8 | REF. NO. 3

FIGURE. 16 | REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT | Drill Hole No. **MW11-09S** | PAGE 1 of 1

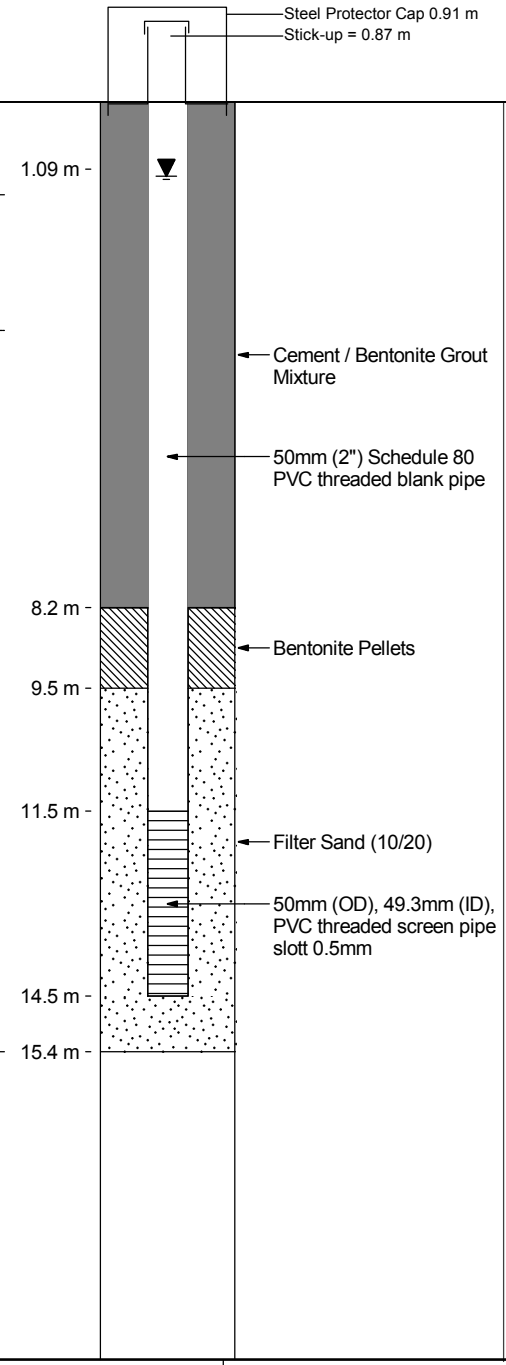
Contractor: JR DRILLING LTD | Sample Type: Cuttings | Date Drilling: 26-JUN-2011

Location: South Side of Proposed TSF | Total Depth: 15.4 m | Date Installation: 26-JUN-2011

Coordinates: 5,609,079 N , 679,860 E (UTM / NAD 83) | Elevation: 895 m | Supervised by: AM

Drilling Method: Air Rotary | Reviewed by: CHS

ELEVATION - (m)	DEPTH - (m)	GRAPHIC LOG	GEOLOGICAL UNIT
	1		(0 to 1.5) SILT/CLAY of low plasticity, well graded sand and gravel, sub angular, trace organics, dry.
	2		
	3		(1.5 to 3.7) CLAY, medium plasticity, some organics, trace sand and gravel, sub rounded, moist, dark grey brown.
	4		
890	5		(3.7 to 15.4) BEDROCK, medium hardness, small angular cuttings, grey pink.
	6		
	7		
	8		
	9		
885	10		
	11		
	12		
	13		
	14		
880	15		
	16		
	17		
	18		
	19		
875	20		



NOTES

152mm (6") drill hole to top of bedrock

Water level measured (27-JUN-2011).

146mm (5-3/4") drill hole to end

GENERAL REMARKS:

REV. 0 - Issued for Report

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

KGHM AJAX MINING INC.
AJAX PROJECT
MONITORING WELL DETAILS FOR MW11-09S

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FIGURE. 17 | REV. 0

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Project:	**AJAX PROJECT**	Drill Hole No.	**MW11-10D**	**PAGE**	1 of 1
Contractor:	**JR DRILLING LTD**	Sample Type:	**Cuttings**	Date Drilling:	**21-NOV-2011**
Location:	**South East of East Waste Rock Facility**	Total Depth:	**85.3 m**	Date Installation:	**22-NOV-2011**
Coordinates:	**5,609,466 N , 687,494 E (UTM / NAD 83)**	Elevation:	**887 m**	Supervised by:	**DLP**
Drilling Method:	**Air Rotary**			Reviewed by:	**CHS**

ELEVATION - (m) | DEPTH - (m) | GRAPHIC LOG

GEOLOGICAL UNIT

(0 to 24.4)
Gravelly SAND, fine to coarse, rounded to subangular gravel clasts, some silt, non plastic, grey and brown, dry to moist.

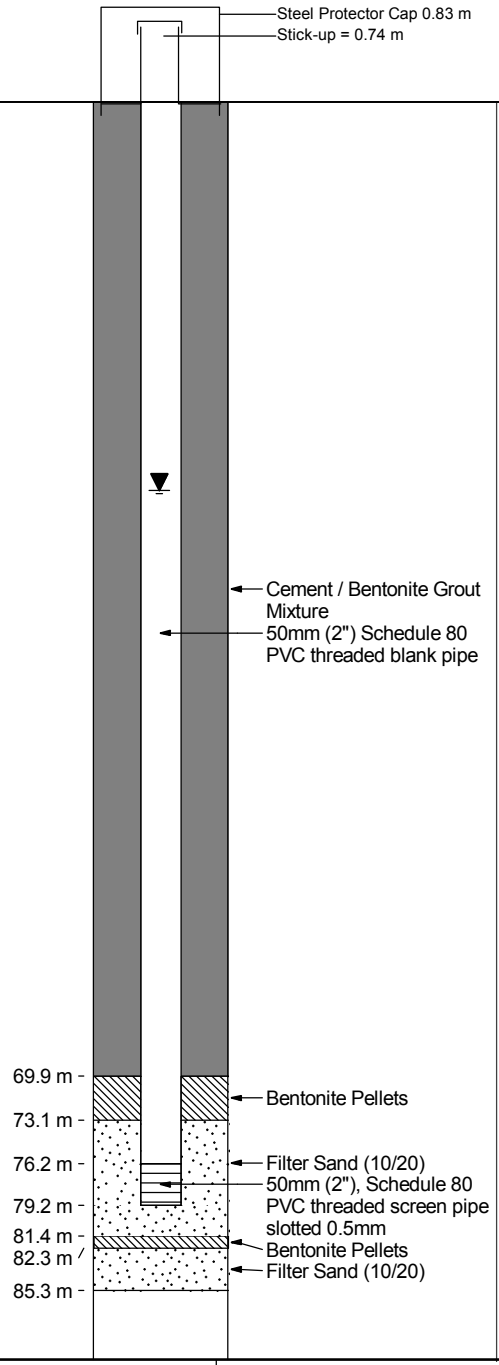
(24.4 to 25.9)
Clayey SILT, medium plasticity, dark grey, moist.

(25.9 to 35.1)
SAND and GRAVEL, sub angular to sub rounded, fine to coarse, some to trace silt, grey, moist to wet.

(35.1 to 39.6)
CLAY and SILT, some sand, trace gravel, medium to high plasticity, grey, moist to wet.

(39.6 to 82.9)
SAND and GRAVEL, subrounded to angular, some to trace silt, grey, wet.

(82.9 to 85.3)
WEATHERED BEDROCK, small angular cuttings, grey and brown.



NOTES

152mm (6") drillhole

Water level measured after installation 25-Nov-2011.

Water observed during drilling starting at 27.4 m

High water discharge during drilling from 67.1 to 77.7 m

40 L/min measured flow airlifting at 83.8 m

GENERAL REMARKS:

REV. 0 - Issued for Report

KGHM AJAX MINING INC.
AJAX PROJECT
MONITORING WELL DETAILS FOR MW11-10D

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF. NO.
VA101-246/8	3
FIGURE. 18	REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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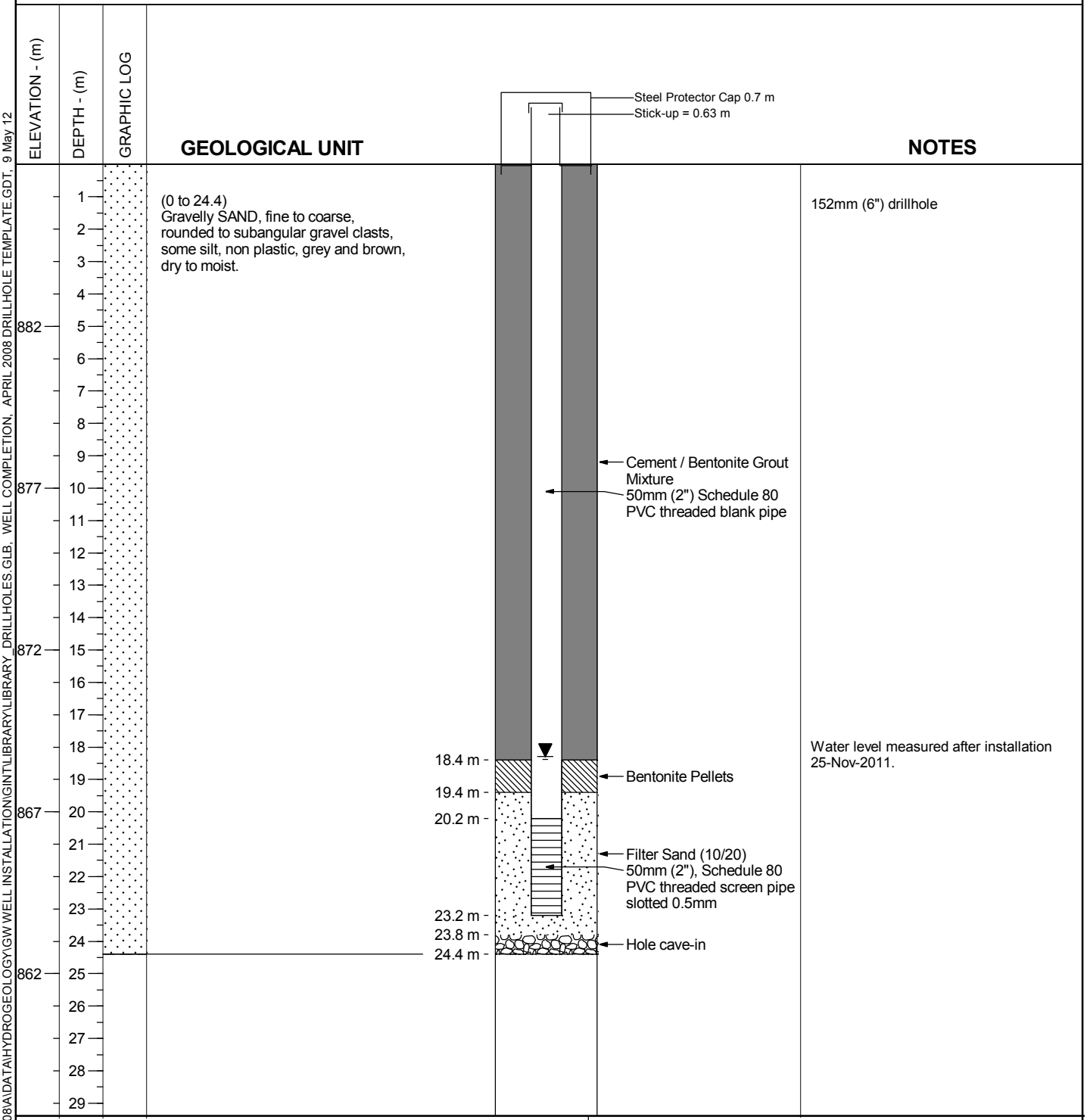
Project: AJAX PROJECT | Drill Hole No. **MW11-10S** | PAGE 1 of 1

Contractor: JR DRILLING LTD | Sample Type: Cuttings | Date Drilling: 23-NOV-2011

Location: South East of East Waste Rock Facility | Total Depth: 24.4 m | Date Installation: 24-NOV-2011

Coordinates: 5,609,467 N , 687,487 E (UTM / NAD 83) | Elevation: 887 m | Supervised by: DLP

Drilling Method: Air Rotary | Reviewed by: CHS



GENERAL REMARKS:

REV. 0 - Issued for Report

KGHM AJAX MINING INC.
AJAX PROJECT
MONITORING WELL DETAILS FOR MW11-10S

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. VA101-246/8 | REF. NO. 3

FIGURE. 19 | REV. 0

Logging conducted according to the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Library: M:\101\00246\08\A\DATA\HYDROGEOLOGY\GW WELL INSTALLATION\GINTLIBRARY\LIBRARY_DRILLHOLES.GLB, WELL COMPLETION, APRIL 2008 DRILLHOLE TEMPLATE.GDT, 9 May 12

Project: AJAX PROJECT
Contractor: Cobra Contracting Ltd.
Location: Proposed KM Pipeline Realignment
Coordinates: 681,523 E , 5,608,686 N UTM NAD83 ZONE10

Test Pit No.: TP14-001
Equipment Used: CAT 320D
Total Depth: 2.1 m
Elevation: 902.9 m

Page: 1 of 1
Date Started: 16 Jul 14
Date Completed: 16 Jul 14
Logged by: MAS/MAP/LEP/LS
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	902.9					**TOPSOIL & ORGANICS** (0 to 0.1) ORGANICS, root inclusions; and TOPSOIL; SILT, some sand, fine grained; subrounded to subangular, non plastic, loose, brownish grey, moist.	0 m - Soil Horizons Not Documented
						SILT (0.1 to 0.5) SILT; some sand; trace gravel, fine to coarse grained clasts up to 4.5 cm, subrounded to subangular, poorly graded, dark brown, loose, massive, root inclusions, moist. [Loess]	
1.0	902.0	G B	TP14-001-1			**SILTY SAND** (0.5 to 1.3) Silty SAND; trace gravel, subangular to subrounded, clasts up to 2 cm, greyish brown, poorly graded, low plasticity, compact, massive, moist. [Loess]	
						SAND & GRAVEL (1.3 to 2.1) SAND and GRAVEL; some silt; trace clay, subangular to subrounded, clasts up to 8 cm in diameter, well graded, non plastic, brown, loose to compact, massive, moist to wet, mainly fine grained gravel; trace cobbles and boulders (subangular), boulders up to 30 cm in saturated zone. [Fluvial]	1.7 m - Groundwater Seepage at 1.7 m
2.0	901.0					End of Test Pit: 2.1 m Refusal on possible bedrock	
3.0	900.0						
4.0	899.0						
5.0	898.0						
	897.0						

GENERAL REMARKS:
Easy excavation, walls sloughing slightly, groundwater at 1.7 m.

SAMPLING SYMBOLS:
G B GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-1

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-002
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 16 Jul 14

Location: Proposed KM Pipeline Realignment
Total Depth: 0.9 m
Date Completed: 16 Jul 14

Coordinates: 681,665 E , 5,608,461 N UTM NAD83 ZONE10
Elevation: 931.9 m
Logged by: MAS/MAP/LEP/LS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	931.9					**TOPSOIL & ORGANICS** (0 to 0.03) ORGANICS, root inclusions; and TOPSOIL; SILT; some sand, fine grained, subangular; trace gravel, fine grained, well graded, low plasticity, light to dark brown, loose, dry, massive.	0 m - Soil Horizons Not Documented
						SAND & GRAVEL (0.03 to 0.9) SAND and GRAVEL, angular to subangular, maximum clasts 30 cm, moderately graded, dark brown, low plasticity, loose, massive, dry, root inclusions up to 60 cm, angular gravel broken/weathered bedrock [Colluvium]	
1.0	931.0					End of Test Pit: 0.9 m Refusal on possible bedrock	
2.0	930.0						
3.0	929.0						
4.0	928.0						
5.0	927.0						
	926.0						

GENERAL REMARKS:
Difficult excavation, walls sloughing, no groundwater.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-2

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-003
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 16 Jul 14

Location: Seepage Collection Pond 1
Total Depth: 0.61 m
Date Completed: 16 Jul 14

Coordinates: 681,764 E , 5,608,262 N UTM NAD83 ZONE10
Elevation: 936.8 m
Logged by: MAS/MAP/LEP/LS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	936.8					**TOPSOIL & ORGANICS** (0 to 0.18) ORGANICS, root inclusions; and TOPSOIL; SILT; some sand, subangular, poorly graded, low plasticity, brown to dark brown, dry, loose to compact.	0 m - Soil Horizons Not Documented
						WEATHERED BEDROCK (0.18 to 0.61) Highly weathered bedrock (Mafic Volcanics?), angular to subangular pieces up to 28 cm in diameter, pieces mostly fine to coarse grained gravel sized; trace cobbles, well graded, non plastic, brown with orange/red minor oxidization.	
1.0	936.0					End of Test Pit: 0.61 m Refusal on possible bedrock	
2.0	935.0						
3.0	934.0						
4.0	933.0						
5.0	932.0						
	931.0						

GENERAL REMARKS:
Difficult excavation.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-3

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Contractor: Cobra Contracting Ltd.
Location: Proposed KM Pipeline Realignment
Coordinates: 681,868 E , 5,608,065 N UTM NAD83 ZONE10

Test Pit No.: TP14-004
Equipment Used: CAT 320D
Total Depth: 3.1 m
Elevation: 931.9 m

Page: 1 of 1
Date Started: 16 Jul 14
Date Completed: 16 Jul 14
Logged by: MAS/MAP/LEP/LS
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	931.9					**TOPSOIL & ORGANICS** (0 to 0.2) ORGANICS, root inclusions; and TOPSOIL; sandy; SILT; some gravel; trace clay, subrounded to subangular, clasts up to 4 cm, poorly graded, low plasticity, brown, loose, massive, dry.	0 m - Soil Horizons Not Documented
1.0	931.0					**SILTY SAND** (0.2 to 1.1) Silty SAND, fine grained; and GRAVEL; some boulders; some cobbles; trace clay; subrounded to subangular, most clasts 3-10 cm, gap graded, low plasticity, brown, loose to compact, massive, dry.	
		G B	TP14-004-1			**SILTY GRAVELLY SAND** (1.1 to 3.1) Silty gravelly SAND; trace clay, subangular to subrounded clasts up to 1 m, mostly 30 cm, gap graded, low to medium plasticity, light brown, loose to compact, massive, dry to moist. [Colluvium]	
2.0	930.0						
3.0	929.0					End of Test Pit: 3.1 m Limit of excavator	
4.0	928.0						
5.0	927.0						
	926.0						

GENERAL REMARKS:
Easy excavation, walls stable.

SAMPLING SYMBOLS:
G B GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-4

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-005
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 17 Jul 14

Location: Proposed KM Pipeline Realignment
Total Depth: 1 m
Date Completed: 17 Jul 14

Coordinates: 682,025 E , 5,607,762 N UTM NAD83 ZONE10
Elevation: 940.1 m
Logged by: MAS/LEP/LS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	940.0					**TOPSOIL & ORGANICS** (0 to 0.2) ORGANICS, root inclusions; and TOPSOIL; silty; SAND; some gravel; trace clay, subangular to subrounded, clasts mostly 1-3 cm, poorly graded, low plasticity, dark brown, compact, massive, dry.	0 m - Soil Horizons Not Documented
						SAND & GRAVEL (0.2 to 1) Gravelly SAND; some silt; trace clay, subangular to subrounded clasts up to 1 m, mostly 30 cm, gap graded, low to medium plasticity, light brown, loose to compact, massive, dry to moist. [Colluvium]	
1.0	939.0					End of Test Pit: 1 m Refusal on bedrock	
2.0	938.0						
3.0	937.0						
4.0	936.0						
5.0	935.0						

GENERAL REMARKS:
Walls stable, no groundwater, difficult to excavate due to boulders.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-5

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-006
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 17 Jul 14

Location: Proposed KM Pipeline Realignment
Total Depth: 4.1 m
Date Completed: 17 Jul 14

Coordinates: 681,768 E , 5,607,861 N UTM NAD83 ZONE10
Elevation: 946.1 m
Logged by: MAS/LEP/LS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	946.0					**TOPSOIL & ORGANICS** (0 to 0.1) ORGANICS, root inclusions; and TOPSOIL; sandy; SILT; some gravel; trace clay, subangular to subrounded, clasts mostly 4-5 cm, poorly graded, low plasticity, dark brown, loose, massive, dry.	0 m - Soil Horizons Not Documented
						SILTY GRAVELLY SAND (0.1 to 4.1) Silty gravelly SAND; trace clay; subrounded to subangular, clasts up to 30 cm (most 2-10 cm), well graded, low plasticity, brown, dense, massive with some stratification with layered lighter and darker layers up to 1 cm wide more silt after 2 m depth, dry [Glacial Till]	
1.0	945.0	G B	TP14-006-1				
2.0	944.0						
3.0	943.0						
4.0	942.0					End of Test Pit: 4.1 m Limit of excavator	
5.0	941.0						

GENERAL REMARKS:
Walls stable, no groundwater, easy to excavate.

SAMPLING SYMBOLS:
G B GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-6

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-007
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 17 Jul 14

Location: North Embankment
Total Depth: 2.8 m
Date Completed: 17 Jul 14

Coordinates: 682,219 E , 5,607,606 N UTM NAD83 ZONE10
Elevation: 945.7 m
Logged by: LEP/LS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	945.7					**TOPSOIL & ORGANICS** (0 to 0.1) ORGANICS, root inclusions; and TOPSOIL; sandy; SILT; some gravel; subangular to subrounded, clasts up to 3 cm, poorly graded, low plasticity, dark brown, loose, dry.	0 m - Soil Horizons Not Documented
1.0	945.0					**SILTY GRAVELLY SAND** (0.1 to 2.8) Silty gravelly SAND; trace clay; subrounded to subangular, clasts up to 30 cm (most 1-12 cm), well graded, low plasticity, brown, compact to dense, massive, moist. [Glacial Till]	
2.0	944.0						
2.8	943.0					End of Test Pit: 2.8 m Refusal on bedrock	
3.0							
4.0	942.0						
5.0	941.0						
	940.0						

GENERAL REMARKS:
Walls stable, no groundwater, easy to excavate.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-7

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-008
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 17 Jul 14

Location: North Embankment
Total Depth: 3.2 m
Date Completed: 17 Jul 14

Coordinates: 682,446 E , 5,607,513 N UTM NAD83 ZONE10
Elevation: 945 m
Logged by: LEP/LS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
						TOPSOIL & ORGANICS (0 to 0.1) ORGANICS, root inclusions; and TOPSOIL; sandy; SILT; some gravel, fine to coarse grained, subangular to subrounded, clasts up to 3 cm, poorly graded, low to no plasticity, dark brown, loose to compact, massive, dry.	0 m - Soil Horizons Not Documented
		GB	TP14-008-1			**SILTY GRAVEL** (0.1 to 1.6) Silty GRAVEL; some cobbles; some sand, fine to coarse grained, angular to subrounded, clasts up to 21 cm, gap graded, low plasticity, brown, loose, massive, dry.	
1.0	944.0						
2.0	943.0					**SILTY GRAVELLY SAND** (1.6 to 3.2) Silty gravelly SAND; trace clay; subrounded to subangular, trace boulders up to 40 cm, gap graded, low plasticity, brown, compact to dense, massive, moist [Glacial Till]	
3.0	942.0					End of Test Pit: 3.2 m Refusal on dense material	
4.0	941.0						
5.0	940.0						

GENERAL REMARKS:
Walls stable, no groundwater, easy to excavate.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-8

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-009
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 18 Jul 14

Location: North Embankment
Total Depth: 3.8 m
Date Completed: 18 Jul 14

Coordinates: 682,494 E , 5,607,288 N UTM NAD83 ZONE10
Elevation: 949.1 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	949.0					**TOPSOIL & ORGANICS** (0 to 0.15) ORGANICS, root inclusions up to 0.4 mbgs; and TOPSOIL; sandy; SILT; some gravel, fine to coarse grained, subangular to subrounded, clasts up to 20 cm, poorly graded, non plastic, dark brown, loose, massive, dry.	0 m - Soil Horizons Not Documented
						SILTY GRAVELLY SAND (0.15 to 3.8) Silty gravelly SAND; subrounded to angular, clasts up to 20 cm, well graded, non plastic, dark brown, compact to dense, massive, dry. [Glacial Till]	
1.0	948.0						
2.0	947.0						
3.0	946.0		TP14-009-1				
						End of Test Pit: 3.8 m Refusal on dense material	
4.0	945.0						
5.0	944.0						

GENERAL REMARKS:
Walls stable, no groundwater, easy to excavate up to 1.5 m.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-9

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-010
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 18 Jul 14

Location: North Embankment
Total Depth: 4.9 m
Date Completed: 18 Jul 14

Coordinates: 682,303 E , 5,607,348 N UTM NAD83 ZONE10
Elevation: 947.1 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	947.0					**TOPSOIL & ORGANICS** (0 to 0.2) ORGANICS, root inclusions up to 0.4 mbgs; and TOPSOIL; sandy; SILT; some gravel, fine to coarse grained, subangular to subrounded, poorly graded, dark brown, loose, dry.	0 m - Soil Horizons Not Documented
						COBBLY GRAVEL (0.2 to 2.2) COBBLY GRAVEL; some sand; some silt; trace boulder (33 cm), most clasts 5-10 cm, sounded to subangular, non plastic, dark brown, loose, massive, dry. [Fluvial]	
1.0	946.0						
2.0	945.0					**SILTY SAND AND GRAVEL** (2.2 to 4.7) Silty SAND and GRAVEL; some cobbles, fine to coarse grained, subrounded to subangular, well graded, non plasticity, dark brown, compact, massive, dry. [Fluvial]	
3.0	944.0						
4.0	943.0						
4.7	942.4					**SILT** (4.7 to 4.8) SILT; some clay; trace sand, poorly graded, medium to high plasticity, medium brownish grey, firm, dry.	
4.8	942.3					**SILTY SAND AND GRAVEL** (4.8 to 4.9) Silty SAND and GRAVEL; some cobbles, fine to coarse grained, subrounded to subangular, well graded, non plasticity, dark brown, compact, massive, dry. [Fluvial]	
4.9	942.2					End of Test Pit: 4.9 m Limit of excavator	
5.0	942.0						

GENERAL REMARKS:
Walls sloughing from surface, no groundwater, very easy to excavate.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-10

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Contractor: Cobra Contracting Ltd.
Location: North Embankment
Coordinates: 682,065 E , 5,607,479 N UTM NAD83 ZONE10

Test Pit No.: TP14-011
Equipment Used: CAT 320D
Total Depth: 3.8 m
Elevation: 959.3 m

Page: 1 of 1
Date Started: 18 Jul 14
Date Completed: 18 Jul 14
Logged by: MAP
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	959.0					**TOPSOIL & ORGANICS** (0 to 0.2) ORGANICS, root inclusions up to 50 cm bgs; and TOPSOIL; sandy; SILT; trace gravel, fine to coarse grained, subangular to subrounded, poorly graded, non plastic, dark brown, loose, dry.	0 m - Soil Horizons Not Documented
						GRAVELLY SANDY SILT (0.2 to 0.7) Gravelly sandy SILT; fine to coarse grained, rounded to subangular, non plastic, dark greyish brown, loose to compact, massive, dry.	
1.0	958.0					**SILTY SAND AND GRAVEL** (0.7 to 3.8) Silty SAND and GRAVEL; trace cobbles (15-20 cm), fine to coarse grained, subrounded to subangular, well graded, non plasticity, greyish brown, very dense, massive, dry. [Glacial Till]	
2.0	957.0						
3.0	956.0	G B	TP14-011-1				
4.0	955.0					End of Test Pit: 3.8 m Refusal on dense material	
5.0	954.0						

GENERAL REMARKS:
Walls stable, no groundwater, very easy to excavate.

SAMPLING SYMBOLS:
G B GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-11

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-012
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 18 Jul 14

Location: North Embankment
Total Depth: 2.1 m
Date Completed: 18 Jul 14

Coordinates: 682,222 E , 5,607,173 N UTM NAD83 ZONE10
Elevation: 972.8 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	972.8					**TOPSOIL & ORGANICS** (0 to 0.15) ORGANICS, root inclusions; and TOPSOIL; silty; SAND; trace gravel; fine to medium grained, subangular to subrounded, non plastic, dark brown, loose, dry.	0 m - Soil Horizons Not Documented
						SILTY SAND (0.15 to 2.1) Silty SAND; some gravel, fine to coarse grained, subrounded to subangular, gap graded, non plastic, dark to medium brown, dense, massive, dry. [Colluvium]	
1.0	972.0						
2.0	971.0					End of Test Pit: 2.1 m Refusal on bedrock	
3.0	970.0						
4.0	969.0						
5.0	968.0						
	967.0						

GENERAL REMARKS:
Walls stable, no groundwater, easy to excavate.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-12

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-013
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 19 Jul 14

Location: North Embankment
Total Depth: 0.9 m
Date Completed: 19 Jul 14

Coordinates: 682,156 E , 5,606,974 N UTM NAD83 ZONE10
Elevation: 992.4 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	992.0					**TOPSOIL & ORGANICS** (0 to 0.4) ORGANICS, root inclusions; and TOPSOIL; sandy; SILT; some gravel, subrounded to angular, non plastic, dark slightly reddish brown, loose, dry.	0 m - Soil Horizons Not Documented
						SILTY SAND (0.4 to 0.9) Silty SAND; trace gravel; fine to coarse grained, subrounded to angular, poorly graded, non plastic, dark brown, compact, dry. [Colluvium]	
1.0	991.0					End of Test Pit: 0.9 m Refusal on bedrock	
2.0	990.0						
3.0	989.0						
4.0	988.0						
5.0	987.0						

GENERAL REMARKS:
Walls stable, no groundwater, easy to excavate.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-13

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Contractor: Cobra Contracting Ltd.
Location: Proposed KM Pipeline Realignment
Coordinates: 681,939 E , 5,607,068 N UTM NAD83 ZONE10

Test Pit No.: TP14-014
Equipment Used: CAT 320D
Total Depth: 2.2 m
Elevation: 989.2 m

Page: 1 of 1
Date Started: 19 Jul 14
Date Completed: 19 Jul 14
Logged by: MAP
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	989.0					**TOPSOIL & ORGANICS** (0 to 0.2) ORGANICS, root inclusions; and TOPSOIL; SILT; some gravel; some sand; some cobbles; fine to coarse grained sand, rounded to angular gravel and cobbles, well graded, non plastic, dark brown, loose, dry.	0 m - Soil Horizons Not Documented
						SANDY GRAVEL (0.2 to 1.4) Sandy GRAVEL; trace silt; trace cobbles; trace root inclusions, fine to coarse grained, well graded, non plastic, brown, loose to compact, dry.	
1.0	988.0	GB	TP14-014-1				
						SANDY SILT (1.4 to 2.2) Sandy SILT; some gravel; some cobbles (fractured bedrock); poorly graded, non plastic, massive, dense, dry. [Colluvium]	
2.0	987.0					End of Test Pit: 2.2 m Refusal on bedrock	
3.0	986.0						
4.0	985.0						
5.0	984.0						

GENERAL REMARKS:
Walls sloughing, no groundwater, easy to excavate.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-14

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-015
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 19 Jul 14

Location: Proposed KM Pipeline Realignment
Total Depth: 3.8 m
Date Completed: 19 Jul 14

Coordinates: 681,867 E , 5,606,900 N UTM NAD83 ZONE10
Elevation: 1001.9 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1001.0					**TOPSOIL & ORGANICS** (0 to 0.2) ORGANICS, root inclusions; and TOPSOIL; SILT; some sand; some gravel; rounded to subangular gravel up to 7 cm in diameter, poorly graded, non plastic, dark brown, very loose, dry.	0 m - Soil Horizons Not Documented
						SILTY SAND (0.2 to 3.8) Silt SAND; some to trace gravel; fine to medium grained, subrounded to subangular; trace cobbles with depth, poorly graded, massive, light grey/brown, dry. [Glacial Till]	
1.0	1000.0						
2.0	999.0						
3.0	998.0	G B	TP14-015-1			End of Test Pit: 3.8 m Refusal on dense material	
4.0	997.0						
5.0	996.0						

GENERAL REMARKS:
Walls stable, no groundwater, easy to excavate.

SAMPLING SYMBOLS:
G B GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-15

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-016
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 19 Jul 14

Location: Proposed KM Pipeline Realignment
Total Depth: 3.8 m
Date Completed: 19 Jul 14

Coordinates: 682,059 E , 5,606,802 N UTM NAD83 ZONE10
Elevation: 1015.6 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1015.6					**TOPSOIL & ORGANICS** (0 to 0.3) ORGANICS, root inclusions to 50 cm; and TOPSOIL; sandy; SILT; some gravel, fine to coarse grained, poorly grade, non plastic, dark brown, loose, dry.	0 m - Soil Horizons Not Documented
1.0	1014.6					**SILTY SAND AND GRAVEL** (0.3 to 1.4) Silty SAND and GRAVEL, fine to coarse grained; trace cobbles, angular to subrounded (broken rock), well graded, non plastic, dark brown/grey to medium grey, massive, dense, dry.	
2.0	1013.6					**SILTY GRAVELLY SAND** (1.4 to 3.8) Silty gravelly SAND, fine to coarse grained. Trace cobbles, rounded to subangular, well grade, dark brown, massive, very dense, dry [Glacial Till].	
3.0	1012.6						
4.0	1011.6					End of Test Pit: 3.8 m Refusal on dense material	
5.0	1010.6						

GENERAL REMARKS:
Walls stable, no groundwater, easy to excavate up to 2 m.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-16

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-017
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 19 Jul 14

Location: Proposed KM Pipeline Realignment
Total Depth: 2.1 m
Date Completed: 19 Jul 14

Coordinates: 681,850 E , 5,606,732 N UTM NAD83 ZONE10
Elevation: 1029 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0						**TOPSOIL & ORGANICS** (0 to 0.3) ORGANICS, root inclusions; and TOPSOIL; sandy; SILT; trace gravel, fine to coarse grained, subrounded to subangular, poorly graded, non plastic, dark brown, loose, dry.	0 m - Soil Horizons Not Documented
						SILTY GRAVELLY SAND (0.3 to 2.1) Silty gravelly SAND, fine to coarse grained, subrounded to angular; trace cobbles and boulders up to 10 cm in diameter, well graded, non plastic, massive, brown, dry [Glacial Till].	
1.0	1028.0						
2.0	1027.0	G B	TP14-017-1			End of Test Pit: 2.1 m Refusal on dense material	
3.0	1026.0						
4.0	1025.0						
5.0	1024.0						

GENERAL REMARKS:
Walls stable, no groundwater, easy to excavate up to 1 m.

SAMPLING SYMBOLS:
G B GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-17

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-018
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 19 Jul 14

Location: Proposed KM Pipeline Realignment
Total Depth: 1.9 m
Date Completed: 19 Jul 14

Coordinates: 682,061 E , 5,606,597 N UTM NAD83 ZONE10
Elevation: 1006.4 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1006.0					**TOPSOIL & ORGANICS** (0 to 0.1) ORGANICS, root inclusions; and TOPSOIL; SAND and SILT; trace gravel; fine to coarse grained, angular to subrounded, poorly graded, non plastic, dark brown, loose, dry.	0 m - Soil Horizons Not Documented
1.0	1005.0					**SILTY GRAVELLY SAND** (0.1 to 1.9) Silty gravelly SAND; some cobbles; fine to coarse grained, angular to subrounded, well graded, non plastic, medium/dark brown, massive, dense, dry [Glacial Till].	
2.0	1004.0					End of Test Pit: 1.9 m Refusal on dense material	
3.0	1003.0						
4.0	1002.0						
5.0	1001.0						

GENERAL REMARKS:
Walls stable, no groundwater, difficult to excavate.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-18

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Contractor: Cobra Contracting Ltd.
Location: North Embankment
Coordinates: 682,217 E , 5,606,538 N UTM NAD83 ZONE10

Test Pit No.: TP14-019
Equipment Used: CAT 320D
Total Depth: 3.3 m
Elevation: 1025 m

Page: 1 of 1
Date Started: 21 Jul 14
Date Completed: 21 Jul 14
Logged by: MAP
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0						**TOPSOIL & ORGANICS** (0 to 0.05) ORGANICS, root inclusions; and TOPSOIL; Silty; SAND; some gravel, fine to coarse grained, subangular to subrounded, poorly graded, non plastic, dark brown, loose, dry.	0 m - A: 0 - 0.3 m
						SAND (0.05 to 2.6) SAND; some silt; trace gravel, rounded to subangular, poorly graded, non plastic, medium dark brown, massive, compact, dry, gravel content increases with depth.	
1.0	1024.0						
2.0	1023.0						
						SILTY SAND (2.6 to 3.3) Silty SAND; some gravel; fine to coarse grained; trace clay, well graded, non plastic (soil is cohesive), dark brown, massive, dense to very dense, dry to moist [Glacial Till].	
3.0	1022.0	G B	TP14-019-1				
						End of Test Pit: 3.3 m Refusal on dense material	
4.0	1021.0						
5.0	1020.0						

GENERAL REMARKS:
Walls stable, no groundwater, difficult to excavate from 2 m onwards.

SAMPLING SYMBOLS:
G B GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-19

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-020
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 21 Jul 14

Location: North Embankment
Total Depth: 2.2 m
Date Completed: 21 Jul 14

Coordinates: 682,232 E , 5,606,336 N UTM NAD83 ZONE10
Elevation: 1028 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
						TOPSOIL & ORGANICS (0 to 0.15) ORGANICS, root inclusions; and TOPSOIL; SILT; some sand, fine grained; trace gravel, poorly graded, dark brown, loose, dry.	0 m - A: 0 - 0.15 m
						SILTY SAND (0.15 to 1) Silty SAND; trace clay; trace gravel; fine grained, poorly graded, low plasticity, brown, massive, loose to compact, moist.	
1.0	1027.0					**SILTY SAND** (1 to 1.4) Silty SAND; trace clay; trace gravel; fine grained, poorly graded, low plasticity, light grey, massive, compact, moist.	
						SILTY GRAVELLY SAND (1.4 to 2.2) Silty gravelly SAND, fine to coarse grained, well graded, non plastic, brown, massive, dry [Glacial Till].	
2.0	1026.0					End of Test Pit: 2.2 m Refusal on dense material	
3.0	1025.0						
4.0	1024.0						
5.0	1023.0						

GENERAL REMARKS:
Walls stable, no groundwater.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-20

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, TEST PIT LOG, 2014 KP DATA TEMPLATE REVB.GDT, 17-Mar-15

Project: AJAX PROJECT
Test Pit No.: TP14-021
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 21 Jul 14

Location: Proposed KM Pipeline Realignment
Total Depth: 3.7 m
Date Completed: 21 Jul 14

Coordinates: 682,039 E , 5,606,408 N UTM NAD83 ZONE10
Elevation: 1034.5 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1034.5					**TOPSOIL & ORGANICS** (0 to 0.1) ORGANICS, root inclusions; and TOPSOIL; Silty; SAND; trace gravel; fine grained, poorly graded, non plastic, dark brown, loose, dry.	0 m - A: 0 - 0.1 m 0.1 m - C: 0.1 - 0.5 m
	1034.0					**SILTY SAND** (0.1 to 0.5) Silty SAND; some gravel, fine to coarse grained, subangular to subrounded, poorly graded, no plastic, dark brown/grey, massive, dense, dry, root inclusions to 0.5 m. [Loess]	
1.0						**SILTY GRAVELLY SAND** (0.5 to 3.7) Silty gravelly SAND; trace clay; trace cobbles, fine to coarse grained, subangular to subrounded, well graded, low plasticity, medium brown with some signs of oxidization in gravel, massive, very dense, dry [Glacial Till]	
	1033.0						
2.0							
	1032.0						
3.0							
	1031.0						
3.7	1030.8					End of Test Pit: 3.7 m Refusal on dense material	
4.0							
	1030.0						
5.0							
	1029.0						

GENERAL REMARKS:
Walls sloughing slightly, no groundwater.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-21

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-022
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 21 Jul 14

Location: Proposed KM Pipeline Realignment
Total Depth: 3.7 m
Date Completed: 21 Jul 14

Coordinates: 681,848 E , 5,606,497 N UTM NAD83 ZONE10
Elevation: 1053.2 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1053.0					**TOPSOIL & ORGANICS** (0 to 0.5) ORGANICS, root mat, grasses; and TOPSOIL; sandy; SILT; some gravel, fine to coarse grained; trace boulders, poorly graded, no plastic, dark brown, massive, loose, dry.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.5 m 0.5 m - C: 0.5 - 0.8 m
1.0	1052.0					**SILTY SAND AND GRAVEL** (0.5 to 3.7) Silty SAND and GRAVEL; trace clay, fine to coarse grained, round to subangular, well graded, low plasticity, medium brown, massive, very dense, dry to moist [Glacial Till].	
2.0	1051.0						
3.0	1050.0	G B	TP14-022-1				
3.7	1049.5					End of Test Pit: 3.7 m Refusal on dense material	
4.0	1049.0						
5.0	1048.0						

GENERAL REMARKS:
Walls sloughing slightly, no groundwater.

SAMPLING SYMBOLS:
G B GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-22

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, TEST PIT LOG, 2014 KP DATA TEMPLATE REVB.GDT, 17-Mar-15

Project: AJAX PROJECT
Test Pit No.: TP14-023
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 21 Jul 14

Location: Proposed KM Pipeline Realignment
Total Depth: 4.4 m
Date Completed: 21 Jul 14

Coordinates: 681,799 E , 5,606,298 N UTM NAD83 ZONE10
Elevation: 1037 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
						TOPSOIL & ORGANICS (0 to 0.1) ORGANICS, root mat; and TOPSOIL; sandy; SILT; trace gravel, rounded to subangular, poorly graded, dark brown, loose, dry.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.6 m
						SILTY SAND (0.1 to 0.6) Silty SAND; trace gravel; trace cobbles up to 40 cm in diameter, poorly graded, non plastic, brown to greyish brown, dense, dry. [Loess]	0.6 m - C: 0.6 - 1.0 m
1.0	1036.0					**GRAVELLY SAND** (0.6 to 4.4) Gravelly SAND, fine to coarse grained, subangular to subrounded; trace clay; trace cobbles, well graded, low plasticity, medium greyish brown, massive, very dense, cohesive, dry [Glacial Till].	
2.0	1035.0						
3.0	1034.0						
4.0	1033.0					End of Test Pit: 4.4 m Refusal on dense material	
5.0	1032.0						

GENERAL REMARKS:
Walls sloughing slightly, no groundwater, difficult to excavate from 1 m onwards.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-23

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Contractor: Cobra Contracting Ltd.
Location: Proposed KM Pipeline Realignment
Coordinates: 681,985 E , 5,606,218 N UTM NAD83 ZONE10

Test Pit No.: TP14-024
Equipment Used: CAT 320D
Total Depth: 1.3 m
Elevation: 1044.3 m

Page: 1 of 1
Date Started: 22 Jul 14
Date Completed: 22 Jul 14
Logged by: MAP
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1044.0					**TOPSOIL & ORGANICS** (0 to 0.2) ORGANICS, root inclusions; and TOPSOIL; sandy; SILT; some gravel, fine to coarse grained, subangular to subrounded, poorly graded, non plastic, medium brown, dense, dry.	0 m - A: 0 - 0.05 m
1.0	1043.0					**SILTY GRAVELLY SAND** (0.2 to 1.1) Silty gravelly SAND, fine to coarse grained, angular to subangular; trace cobbles, well graded, non plastic, medium brown, massive, compact/dense, non cohesive, gravel and cobbles becoming more frequent with depth, dry. [Colluvium]	
						WEATHERED BEDROCK (1.1 to 1.3) Angular gravel to cobbles sized pieces of rock, medium grey, field rock interpretation Mafic Volcanics.	
2.0	1042.0					End of Test Pit: 1.3 m Refusal on weathered bedrock	
3.0	1041.0						
4.0	1040.0						
5.0	1039.0						

GENERAL REMARKS:
Walls sloughing slightly, no groundwater, difficult to excavate, bedrock outcrop nearby.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-24

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-025
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 22 Jul 14

Location: Proposed KM Pipeline Realignment
Total Depth: 1.8 m
Date Completed: 22 Jul 14

Coordinates: 682,190 E , 5,606,160 N UTM NAD83 ZONE10
Elevation: 1048 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
						TOPSOIL & ORGANICS (0 to 0.2) ORGANICS, root inclusions, other decomposed material.	0 m - A: 0 - 0.2 m
						SANDY SILT (0.2 to 1) Sandy SILT; trace gravel, poorly graded, low to non plasticity, slightly cohesive, light grey, massive, firm to stiff, dry. [Loess]	
1.0	1047.0					**SANDY GRAVELLY SILT** (1 to 1.8) Sandy gravelly SILT; gravel potentially fractured weathered bedrock, medium grey, layered, can be broken by hand. [Colluvium]	
2.0	1046.0					End of Test Pit: 1.8 m Refusal on weathered bedrock	
3.0	1045.0						
4.0	1044.0						
5.0	1043.0						

GENERAL REMARKS:
Walls sloughing slightly, no groundwater, difficult to excavate after 1 m.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-25

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT | **Test Pit No.:** TP14-026 | **Page:** 1 of 1

Contractor: Cobra Contracting Ltd. | Equipment Used: CAT 320D | Date Started: 22 Jul 14

Location: North Embankment | Total Depth: 0.55 m | Date Completed: 22 Jul 14

Coordinates: 682,340 E , 5,606,184 N UTM NAD83 ZONE10 | Elevation: 1038.6 m | Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1038.0					**TOPSOIL & ORGANICS** (0 to 0.3) ORGANICS, root mat; and TOPSOIL; silty SAND; trace gravel; fine to coarse grained, angular to subrounded, non plastic, medium brown, loose, dry.	0 m - A: 0 - 0.3 m
						SILTY SAND (0.3 to 0.5) Silty SAND, fine to coarse grained, light greyish brown, poorly graded, non plastic, light greyish brown, massive, compact, dry. [Colluvium]	
1.0	1037.0					**WEATHERED BEDROCK** (0.5 to 0.55) Highly fractured, angular pieces of rock, medium grey, excavator cannot break through, field rock interpretation Mafic Volcanics.	
2.0	1036.0					End of Test Pit: 0.55 m Refusal on weathered bedrock	
3.0	1035.0						
4.0	1034.0						
5.0	1033.0						

GENERAL REMARKS:

Difficult to excavate, bedrock outcrop nearby.

SAMPLING SYMBOLS:

GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-26

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-027
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 22 Jul 14

Location: North Embankment
Total Depth: 3.6 m
Date Completed: 22 Jul 14

Coordinates: 682,508 E , 5,606,322 N UTM NAD83 ZONE10
Elevation: 1031.2 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1031.0					**TOPSOIL & ORGANICS** (0 to 0.3) ORGANICS, root mat; and TOPSOIL; SILT; some sand; trace gravel; fine grained, poorly graded, loose, dry, roots visible down to 0.6 m.	0 m - A: 0 - 0.15 m 0.15 m - B: 0.15 - 0.35 m 0.35 m - C: 0.35 - 1.1 m
						SANDY GRAVEL (0.3 to 1.1) Sandy GRAVEL, fine to coarse grained, angular to subrounded; some silt; trace cobbles up to 15 cm in diameter, subrounded, well graded, light brown, massive, compact, dry.	
1.0	1030.0					**SILTY GRAVELLY SAND** (1.1 to 3.6) Silty gravelly SAND, fine to coarse grained; trace cobbles, subangular to subrounded, well graded, medium brown, massive, dense, dry to moist [Glacial Till].	
2.0	1029.0						
3.0	1028.0	G B	TP14-027-1				
						End of Test Pit: 3.6 m Refusal on dense material	
4.0	1027.0						
5.0	1026.0						

GENERAL REMARKS:
Walls sloughing, no groundwater, easy to excavate.

SAMPLING SYMBOLS:
G B GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-27

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-028
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 22 Jul 14

Location: North Embankment
Total Depth: 3 m
Date Completed: 22 Jul 14

Coordinates: 682,377 E , 5,606,380 N UTM NAD83 ZONE10
Elevation: 1036.2 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1036.0					**TOPSOIL & ORGANICS** (0 to 0.1) ORGANICS, root mat; and TOPSOIL; sandy; SILT; trace gravel; fine grained, poorly graded, loose, dry, roots visible to 0.6 m.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.4 m 0.4 m - C: 0.4 - 0.5 m
						SANDY SILT (0.1 to 0.5) Sandy SILT; trace gravel, fine to coarse grained, poorly graded, non plastic, medium brown, massive, firm, dry. [Loess]	
1.0	1035.0					**GRAVELLY SAND** (0.5 to 3) Gravelly SAND, fine to coarse grained; some silt; trace clay; trace boulders up to 60 cm in diameter, well graded, non plastic, cohesive, medium brown, massive, very dense, dry [Glacial Till].	
2.0	1034.0						
3.0	1033.0					End of Test Pit: 3 m Refusal on dense material	
4.0	1032.0						
5.0	1031.0						

GENERAL REMARKS:
Walls sloughing, no groundwater, easy to excavate.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-28

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT | **Test Pit No.:** TP14-029 | **Page:** 1 of 1

Contractor: Cobra Contracting Ltd. | Equipment Used: CAT 320D | Date Started: 22 Jul 14

Location: North Embankment | Total Depth: 4.2 m | Date Completed: 22 Jul 14

Coordinates: 682,575 E , 5,606,517 N UTM NAD83 ZONE10 | Elevation: 1013.5 m | Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1013.0					**TOPSOIL & ORGANICS** (0 to 0.3) ORGANICS, root mat; and TOPSOIL; sandy; SILT; trace gravel, poorly graded, non plastic, dark brown, loose, dry.	0 m - A: 0 - 0.3 m 0.3 m - B: 0.3 - 0.7 m
						SANDY SILT (0.3 to 0.7) Sandy SILT; trace gravel; trace cobbles; trace boulders; fine to coarse grained, angular to subrounded, gap graded, non plastic, dark brown, dry.	
1.0	1012.0					**SILTY GRAVELLY SAND** (0.7 to 4.2) Silty gravelly SAND, fine to coarse grained, subrounded to angular, poorly graded, non plastic, dark brown, dense, dry to moist [Glacial Till].	
2.0	1011.0						
3.0	1010.0						
4.0		G B	TP14-029-1			End of Test Pit: 4.2 m Refusal on dense material	
	1009.0						
5.0	1008.0						

GENERAL REMARKS:

Walls sloughing, no groundwater, moderately difficult to excavate.

SAMPLING SYMBOLS:

G B GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-29

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-030
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 22 Jul 14

Location: North Embankment
Total Depth: 3 m
Date Completed: 22 Jul 14

Coordinates: 682,391 E , 5,606,586 N UTM NAD83 ZONE10
Elevation: 1031.2 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1031.0					**TOPSOIL & ORGANICS** (0 to 0.6) ORGANICS, root mat; and TOPSOIL; sandy; SILT; trace gravel, fine grained, non plastic, very dark brown, loose, dry, minimal root inclusions.	0 m - A: 0 - 0.3 m 0.3 m - B: 0.3 - 0.6 m 0.6 m - C: 0.6 - 1.2 m
1.0	1030.0					**SILTY GRAVELLY SAND** (0.6 to 3) Silty; gravelly; SAND, fine to coarse grained, angular to subrounded; trace cobbles, well graded, non plastic, medium brown, massive, dense, dry, more gravel with depth [Glacial Till].	
2.0	1029.0						
3.0	1028.0					End of Test Pit: 3 m Refusal on dense material	
4.0	1027.0						
5.0	1026.0						

GENERAL REMARKS:
Walls stable, no groundwater, moderately difficult to excavate.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-30

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-031
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 23 Jul 14

Location: North Embankment
Total Depth: 3.8 m
Date Completed: 23 Jul 14

Coordinates: 682,255 E , 5,606,727 N UTM NAD83 ZONE10
Elevation: 1027 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
						TOPSOIL & ORGANICS (0 to 0.5) ORGANICS, root inclusions to 0.5 m; and TOPSOIL; sandy; SILT; trace gravel, fine to coarse grained, poorly graded, non plastic, dark brown, loose, dry.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.5 m 0.5 m - C: 0.5 - 1.3 m
1.0	1026.0					**SAND & GRAVEL** (0.5 to 1.3) SAND and GRAVEL; some silt; trace cobbles; trace clay; fine to coarse grained, angular to rounded, well graded, low plasticity; medium brown, massive; dense, dry.	
2.0	1025.0					**SILTY GRAVELLY SAND** (1.3 to 3.8) Silty gravelly SAND; trace clay, fine to coarse grained, angular to subrounded, well graded, low to no plasticity, cohesive, medium/dark brown, massive, very dense, dry [Glacial Till].	
3.0	1024.0						
4.0	1023.0					End of Test Pit: 3.8 m Refusal on dense material	
5.0	1022.0						

GENERAL REMARKS:
Walls sloughing, no groundwater, easy to excavate.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-31

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-032
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 23 Jul 14

Location: North Embankment
Total Depth: 4.5 m
Date Completed: 23 Jul 14

Coordinates: 682,472 E , 5,606,761 N UTM NAD83 ZONE10
Elevation: 1016.8 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1016.8					**TOPSOIL/ORGANICS** (0 to 0.2) ORGANICS, root mat; and TOPSOIL; Sandy SILT; trace gravel, fine to coarse grained; poorly graded, non plastic, dark brown, loose, dry.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.5 m 0.5 m - C: 0.5 - 1.1 m
						SAND AND SILT (0.2 to 1.1) SAND and SILT; trace gravel; fine grained; poorly graded, low plasticity, medium brown, massive, dense, dry.	
1.0	1016.0					**SILTY GRAVELLY SAND** (1.1 to 4.5) silty gravelly SAND, fine grained; gravel and density increasing with depth, well graded, low plasticity, cohesive, medium brown, massive, dense to very dense, dry [Glacial Till].	
2.0	1015.0						
	1014.0						
3.0	1013.0						
4.0		G B	TP14-032-1			End of Test Pit: 4.5 m Limit of excavator	
	1012.0						
5.0	1011.0						

GENERAL REMARKS:
Walls sloughing, no groundwater, easy to excavate up to 1.5 m.

SAMPLING SYMBOLS:
G B GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-32

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Contractor: Cobra Contracting Ltd.
Location: TSF Basin
Coordinates: 682,607 E , 5,606,681 N UTM NAD83 ZONE10

Test Pit No.: TP14-033
Equipment Used: CAT 320D
Total Depth: 3.3 m
Elevation: 994.5 m

Page: 1 of 1
Date Started: 23 Jul 14
Date Completed: 23 Jul 14
Logged by: MAP
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	994.0					**TOPSOIL/ORGANICS** (0 to 0.6) ORGANICS, root inclusions up to 3 cm in diameter; and TOPSOIL; Sandy SILT; trace gravel, fine to coarse grained; poorly graded; non plastic; dark brown; loose; dry.	0 m - A: 0 - 0.6 m
1.0	993.0					**SILTY SAND** (0.6 to 3.3) silty SAND, fine to medium grained; trace gravel, angular to sub rounded; trace clay; trace cobbles up to 20 cm in diameter; poorly graded; non plastic; slightly cohesive; brown; massive; compact; dry. [Glacial Till]	0.6 m - B: 0.6 - 1.0 m
2.0	992.0						
3.0	991.0					End of Test Pit: 3.3 m Refusal on bedrock / boulder	
4.0	990.0						
5.0	989.0						

GENERAL REMARKS:
Walls collapsing/sliding, no groundwater, easy to excavate.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-33

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-034
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 23 Jul 14

Location: TSF Basin
Total Depth: 4.3 m
Date Completed: 23 Jul 14

Coordinates: 682,700 E , 5,606,898 N UTM NAD83 ZONE10
Elevation: 990.8 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	990.0					**TOPSOIL/ORGANICS** (0 to 0.3) ORGANICS, root mat; and TOPSOIL; SILT; some sand; trace gravel; fine grained; poorly graded, non plastic, dark brown, loose, dry.	0 m - A: 0 - 0.3 m 0.3 m - B: 0.3 - 0.6 m
						SILTY SAND (0.3 to 0.6) silty SAND; trace gravel; fine to coarse grained, sub angular to sub rounded; poorly graded, non plastic, medium brown, massive, dense, dry.	0.6 m - C: 0.6 - 0.9 m
1.0						**SANDY GRAVEL** (0.6 to 0.9) sandy GRAVEL, fine to coarse grained; trace cobbles; well graded, non plastic, light brownish grey, massive, dense, dry.	
						SILTY GRAVELLY SAND (0.9 to 4.3) silty gravelly SAND, fine to coarse grained, angular to sub rounded; well graded, low plasticity, cohesive, dark brown, massive, very dense, dry to moist [Glacial Till].	
2.0	989.0						
3.0	988.0						
4.0	987.0	G B	TP14-034-1			End of Test Pit: 4.3 m Refusal on dense material	
5.0	986.0						
	985.0						

GENERAL REMARKS:
Walls sloughing, no groundwater, easy to excavate up to 2 m.

SAMPLING SYMBOLS:
G B GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-34

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, TEST PIT LOG, 2014 KP DATA TEMPLATE REVB.GDT, 17-Mar-15

Project: AJAX PROJECT
Test Pit No.: TP14-035
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 24 Jul 14

Location: TSF Basin
Total Depth: 4.5 m
Date Completed: 24 Jul 14

Coordinates: 682,515 E , 5,606,946 N UTM NAD83 ZONE10
Elevation: 994.2 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	994.0					**TOPSOIL/ORGANICS** (0 to 0.5) ORGANICS, root mat; and TOPSOIL; SILT; some gravel, fine to coarse grained, sub angular to rounded, poorly graded, non plastic, dark to medium brown, loose, dry.	0 m - A: 0 - 0.3 m 0.3 m - B: 0.3 - 0.5 m 0.5 m - C: 0.5 - 0.8 m
						SANDY SILTY GRAVEL (0.5 to 0.8) sandy silty GRAVEL, fine grained, rounded to sub angular; well graded, non plastic, light grey gravel, medium grey sand, massive, dense, dry.	
1.0	993.0					**SILTY SAND AND GRAVEL** (0.8 to 4.5) Silty sand and GRAVEL, fine to coarse grained; trace cobbles; well graded, medium plasticity, medium brown, massive, very dense, dry [Glacial Till].	
2.0	992.0						
3.0	991.0						
4.0	990.0						
						End of Test Pit: 4.5 m Refusal on dense material	
5.0	989.0						

GENERAL REMARKS:
Walls sloughing up to 1.5 m, no groundwater, easy to excavate up to 1.5 m.

SAMPLING SYMBOLS:
G B GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-35

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, TEST PIT LOG, 2014 KP DATA TEMPLATE REVB.GDT, 17-Mar-15

Project: AJAX PROJECT
Test Pit No.: TP14-036
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 24 Jul 14

Location: North Embankment
Total Depth: 3.8 m
Date Completed: 24 Jul 14

Coordinates: 682,334 E , 5,606,909 N UTM NAD83 ZONE10
Elevation: 999.3 m
Logged by: MAP/LS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	999.0					**TOPSOIL/ORGANICS** (0 to 0.2) ORGANICS, root mat; and TOPSOIL; Sandy SILT; trace gravel; trace cobbles, sub rounded to sub angular; root inclusions; poorly graded, low to no plasticity, dark brown, loose, moist.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.6 m
1.0	998.0					**GRAVELLY SAND** (0.2 to 1) Gravelly SAND, fine to coarse grained, sub rounded to sub angular; trace cobbles up to 20 cm in diameter; root inclusions up to 0.6 m; well graded, low to no plasticity, light brown, loose to compact, dry to moist.	0.6 m - C: 0.6 - 1.0 m
2.0	997.0					**SILTY GRAVELLY SAND** (1 to 3.8) Silty gravelly SAND; some cobbles, sub angular to sub rounded; trace clay; trace boulders; well graded, low plasticity, brown, massive, moist. [Glacial Till]	
3.0	996.0	GB	TP14-036-1				
4.0	995.0					End of Test Pit: 3.8 m Limit of excavator	
5.0	994.0						

GENERAL REMARKS:
No groundwater, easy to excavate.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-36

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, TEST PIT LOG, 2014 KP DATA TEMPLATE REVB.GDT, 17-Mar-15

Project: AJAX PROJECT
Test Pit No.: TP14-037
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 24 Jul 14

Location: North Embankment
Total Depth: 1.5 m
Date Completed: 24 Jul 14

Coordinates: 682,404 E , 5,607,107 N UTM NAD83 ZONE10
Elevation: 976.9 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	976.9					**TOPSOIL/ORGANICS** (0 to 0.5) ORGANICS, root mat, root inclusions down to 0.5 m; and TOPSOIL; SAND and SILT; trace gravel, fine to coarse grained, sub angular to rounded; poorly graded, non plastic, dark brown, loose, dry.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.5 m 0.5 m - C: 0.5 - 0.7 m
						SANDY GRAVEL (0.5 to 0.7) Sandy GRAVEL, fine to coarse grained, angular to sub rounded; some silt; well graded, non plastic, light greyish brown, massive, dense, dry. [Colluvium]	
1.0	976.0					**WEATHERED BEDROCK** (0.7 to 1.5) mostly cobble sized fragments; very strong, highly fractured, some iron oxide staining visible, field rock interpretation volcaniclastics.	
2.0	975.0						
3.0	974.0						
4.0	973.0						
5.0	972.0					End of Test Pit: 1.5 m Refusal on weathered bedrock	
	971.0						

GENERAL REMARKS:
Walls stable, no groundwater, easy to excavate up to 1.5 m.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-37

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-038
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 24 Jul 14

Location: TSF Basin
Total Depth: 4.1 m
Date Completed: 24 Jul 14

Coordinates: 682,630 E , 5,607,130 N UTM NAD83 ZONE10
Elevation: 968.7 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	968.0					**TOPSOIL/ORGANICS** (0 to 0.7) ORGANICS, root mat; and TOPSOIL; Sandy SILT; some gravel, fine to coarse grained; poorly graded, non plastic, dark brown, massive, loose to compact, dry.	0 m - A: 0 - 0.5 m 0.5 m - B: 0.5 - 0.7 m 0.7 m - C: 0.7 - 1.0 m
1.0						**SILTY SAND AND GRAVEL** (0.7 to 1) Silty sand and GRAVEL, fine to coarse grained, angular to sub rounded; trace cobbles; well graded; non plastic, light brownish grey, massive, dense, dry.	
	967.0					**SILTY GRAVELLY SAND** (1 to 4.1) Silty gravelly SAND, fine to coarse grained, sub angular to sub rounded; trace cobbles; well graded, low to medium plasticity, cohesive, medium to dark brown, massive, very dense, dry [Glacial Till].	
2.0							
	966.0						
3.0							
	965.0						
4.0		G B	TP14-038-1			End of Test Pit: 4.1 m Refusal on dense material	
	964.0						
5.0							
	963.0						

GENERAL REMARKS:
Walls sloughing up to 1.5 m, no groundwater, easy to excavate up to 1.5 m.

SAMPLING SYMBOLS:
G B GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-38

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Contractor: Cobra Contracting Ltd.
Location: TSF Basin
Coordinates: 682,826 E , 5,607,052 N UTM NAD83 ZONE10

Test Pit No.: TP14-039
Equipment Used: CAT 320D
Total Depth: 4.4 m
Elevation: 961.3 m

Page: 1 of 1
Date Started: 24 Jul 14
Date Completed: 24 Jul 14
Logged by: MAP
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	961.0					**TOPSOIL/ORGANICS** (0 to 0.7) ORGANICS, root mat, grasses; and TOPSOIL; Silty SAND; trace gravel, fine to coarse grained, angular to sub rounded; poorly graded, non plastic, dark brown, massive, compact, dry.	0 m - A: 0 - 0.4 m 0.4 m - B: 0.4 - 0.7 m 0.7 m - C: 0.7 - 1.0 m
1.0	960.0					**SILTY SAND** (0.7 to 1) Silty SAND; trace gravel, fine to coarse grained, angular to sub rounded; trace clay; poorly graded, low plasticity, light grey, laminated, dense, dry. [Glaciolacustrine] **SANDY GRAVELLY SILT** (1 to 4.4) Sandy gravelly SILT; fine to coarse grained, angular to sub rounded; some clay; well graded, low plasticity, cohesive, dark to medium brown, massive, very dense, dry [Glacial Till].	
2.0	959.0						
3.0	958.0						
4.0	957.0	G B	TP14-039-1			End of Test Pit: 4.4 m Refusal on dense material	
5.0	956.0						

GENERAL REMARKS:
Walls stable, no groundwater, easy to excavate.

SAMPLING SYMBOLS:
G B GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-39

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-040
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 25 Jul 14

Location: TSF Basin
Total Depth: 4.2 m
Date Completed: 25 Jul 14

Coordinates: 682,771 E , 5,607,268 N UTM NAD83 ZONE10
Elevation: 943.7 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	943.7					**TOPSOIL/ORGANICS** (0 to 0.1) ORGANICS, root inclusions to 1.2 m deep; and TOPSOIL; Silty SAND, fine grained; trace gravel, rounded; poorly graded, non plastic, dark brown, loose, dry.	0 m - A: 0 - 0.3 m 0.3 m - B: 0.3 - 0.7 m
	943.0					**SILTY SAND** (0.1 to 0.7) Silty SAND, fine to coarse grained; trace gravel, fine to coarse grained, sub angular to rounded; trace clay; poorly graded, medium brown, massive, dense, dry.	
1.0						**SAND AND GRAVEL** (0.7 to 2) SAND and GRAVEL, fine to coarse grained, angular to rounded; some cobbles, sub angular to sub rounded; some silt; trace clay; well graded, non plastic, medium brown, massive, dense, dry.	
	942.0						
2.0						**SILTY GRAVELLY SAND** (2 to 4.2) Silty gravelly SAND, fine to coarse grained angular to sub angular sand, fine to coarse grained sub rounded gravel; trace clay; trace cobbles and boulders up to 60 cm in diameter; well graded, non plastic, dark greyish brown, massive, very dense, dry. [Glacial Till]	
	941.0						
3.0							
	940.0						
4.0						End of Test Pit: 4.2 m Limit of excavator	
	939.0						
5.0							
	938.0						

GENERAL REMARKS:
Walls sloughing up to 1.4 m, no groundwater, easy to excavate up to 2 m.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-40

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, TEST PIT LOG, 2014 KP DATA TEMPLATE REVB.GDT, 17-Mar-15

Project: AJAX PROJECT
Test Pit No.: TP14-041
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 25 Jul 14

Location: TSF Basin
Total Depth: 4.1 m
Date Completed: 25 Jul 14

Coordinates: 682,649 E , 5,607,417 N UTM NAD83 ZONE10
Elevation: 948.7 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	948.7					**TOPSOIL/ORGANICS** (0 to 0.05) ORGANICS, root mat, grass; and TOPSOIL; SAND and SILT; trace gravel, fine grained; poorly graded, non plastic, dark brown, root inclusions, loose, dry.	0 m - A: 0 - 0.05 m 0.05 m - B: 0.05 - 0.3 m 0.3 m - C: 0.3 - 0.5 m
						SILTY SAND (0.05 to 0.3) Silty SAND, fine grained; trace clay; trace gravel, fine grained; poorly graded, non plastic, medium brown, massive, dense, dry.	
1.0	948.0					**SAND AND GRAVEL** (0.3 to 0.5) SAND and GRAVEL. Fine to coarse grained, up to 7 cm in diameter; some silt; trace clay; well graded, non plastic, medium brown, massive, dense, dry.	
						SILTY GRAVELLY SAND (0.5 to 4.1) Silty gravelly SAND, fine to some coarse grained, angular to rounded; well graded, non plastic, cohesive, medium brown, massive, very dense, dry [Glacial Till]	
2.0	947.0						
3.0	946.0						
4.0	945.0	G B	TP14-041-1			End of Test Pit: 4.1 m Limit of excavator	
5.0	944.0						
	943.0						

GENERAL REMARKS:
Walls stable, no groundwater, easy to excavate up to 1.4 m.

SAMPLING SYMBOLS:
G B GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-41

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, TEST PIT LOG, 2014 KP DATA TEMPLATE REVB.GDT, 17-Mar-15

Project: AJAX PROJECT
Test Pit No.: TP14-042
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 25 Jul 14

Location: TSF Basin
Total Depth: 4 m
Date Completed: 25 Jul 14

Coordinates: 682,810 E , 5,607,535 N UTM NAD83 ZONE10
Elevation: 951.2 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	951.0					**TOPSOIL/ORGANICS** (0 to 0.2) ORGANICS, root mat, grasses; and TOPSOIL; Sandy SILT; trace gravel, fine to coarse grained, rounded, poorly graded, non plastic, dark brown, loose, dry.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.7 m
						SANDY SILT (0.2 to 0.7) Sandy SILT; trace gravel, fine to coarse grained, rounded, poorly graded, non plastic, light brown, dense, dry. [Loess]	
1.0	950.0					**SAND** (0.7 to 1.8) SAND, fine grained; some gravel, fine to coarse grained, sub angular to rounded; some silt; trace cobbles; trace clay; well graded, non plastic, cohesive, light greyish brown, massive, dense, dry. [Loess]	
2.0	949.0					**SILTY GRAVELLY SAND** (1.8 to 4) Silty gravelly SAND, fine to coarse grained, angular to sub rounded; well graded, low plasticity, cohesive, very dense, massive, dry [Glacial Till].	
3.0	948.0						
4.0	947.0					End of Test Pit: 4 m Limit of excavator	
5.0	946.0						

GENERAL REMARKS:
Walls sloughing slightly, no groundwater, easy to excavate.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-42

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, TEST PIT LOG, 2014 KP DATA TEMPLATE REVB.GDT, 17-Mar-15

Project: AJAX PROJECT
Test Pit No.: TP14-043
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 25 Jul 14

Location: TSF Basin
Total Depth: 4.1 m
Date Completed: 25 Jul 14

Coordinates: 682,774 E , 5,607,748 N UTM NAD83 ZONE10
Elevation: 952.7 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	952.7					**TOPSOIL/ORGANICS** (0 to 0.4) ORGANICS, root mat; and TOPSOIL; Sandy SILT; trace gravel, fine grained, angular to sub rounded; trace clay; poorly graded, non plastic, dark brown, loose, dry.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.4 m 0.4 m - C: 0.4 - 0.7 m
	952.0					**GRAVELLY SAND** (0.4 to 0.7) Gravelly SAND; fine to coarse grained, angular to rounded; some silt; trace cobbles; well graded, non plastic, medium greyish brown, massive, dry.	
1.0						**SILTY GRAVELLY SAND** (0.7 to 4.1) Silty gravelly SAND, fine to coarse grained, rounded to sub angular; trace cobbles; trace clay; well graded, low to no plasticity, dark grey/brown, massive, dry [Glacial Till].	
	951.0						
2.0							
	950.0						
3.0							
	949.0						
4.0						End of Test Pit: 4.1 m Limit of excavator	
	948.0						
5.0							
	947.0						

GENERAL REMARKS:
Walls sloughing slightly, no groundwater, easy to excavate up to 1 m.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-43

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, TEST PIT LOG, 2014 KP DATA TEMPLATE REVB.GDT, 17-Mar-15

Project: AJAX PROJECT
Test Pit No.: TP14-044
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 25 Jul 14

Location: North Embankment
Total Depth: 5 m
Date Completed: 25 Jul 14

Coordinates: 682,595 E , 5,607,643 N UTM NAD83 ZONE10
Elevation: 964.8 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	964.0					**TOPSOIL/ORGANICS** (0 to 0.5) ORGANICS, root mat; and TOPSOIL; Sandy SILT; trace gravel, fine grained; poorly graded, non plastic, dark to medium brown, loose to dense, dry.	0 m - A: 0 - 0.3 m 0.3 m - B: 0.3 - 0.5 m
1.0						**SAND AND GRAVEL** (0.5 to 2) SAND and GRAVEL, fine to coarse grained; some silt; trace cobbles up to 30 cm in diameter; well graded, non plastic, greyish brown, massive, dense, dry.	
2.0	963.0					**SILT** (2 to 5) SILT; some sand, very fine grained; trace gravel; trace clay; poorly graded, non plastic, not cohesive, dense, dry. [Loess]	
3.0	962.0						
4.0	961.0						
5.0	960.0	G B	TP14-044-1			End of Test Pit: 5 m Limit of excavator	
	959.0						

GENERAL REMARKS:
Walls stable, no groundwater, very easy to excavate.

SAMPLING SYMBOLS:
G B GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-44

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, TEST PIT LOG, 2014 KP DATA TEMPLATE REVB.GDT, 17-Mar-15

Project: AJAX PROJECT
Test Pit No.: TP14-045
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 25 Jul 14

Location: North Embankment
Total Depth: 4.2 m
Date Completed: 25 Jul 14

Coordinates: 682,547 E , 5,607,842 N UTM NAD83 ZONE10
Elevation: 957.7 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	957.7					**TOPSOIL/ORGANICS** (0 to 0.6) ORGANICS, root mat; and TOPSOIL; SILT; some sand, fine grained; trace gravel, rounded; poorly graded, non plastic, dark brown, root inclusion, loose to dense, dry.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.6 m
	957.0					**SANDY GRAVEL** (0.6 to 2) Sandy GRAVEL, fine to coarse grained, angular to sub rounded; some silt; trace cobbles up to 20 cm in diameter; well graded, non plastic, greyish brown, dense, dry.	0.6 m - C: 0.6 - 2.0 m
1.0							
	956.0						
2.0							
	955.0					**SILTY GRAVELLY SAND** (2 to 4.2) Silty gravelly SAND, fine to coarse grained; some cobbles, rounded to sub angular; trace clay; well graded, non plastic, cohesive medium greyish brown, massive, dense, dry [Glacial Till].	
3.0							
	954.0						
4.0							
	953.0					End of Test Pit: 4.2 m Limit of excavator	
5.0							
	952.0						

GENERAL REMARKS:
Walls sloughing from 0 - 1.2 m, no groundwater, easy to excavate up to 2 m.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-45

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-046
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 26 Jul 14

Location: North Embankment
Total Depth: 2.6 m
Date Completed: 26 Jul 14

Coordinates: 682,368 E , 5,607,766 N UTM NAD83 ZONE10
Elevation: 945 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	945.0					**TOPSOIL/ORGANICS** (0 to 0.4) ORGANICS, root mat; and TOPSOIL; Sandy SILT; trace gravel, fine grained, rounded to sub angular; poorly graded, non plastic, dark to medium brown, root inclusions, loose becoming dense, dry.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.4 m 0.4 m - C: 0.4 - 0.6 m
						SILTY GRAVELLY SAND (0.4 to 2.6) Silty gravelly SAND, fine to coarse grained; some cobbles, rounded to sub angular; well graded, low to no plasticity, medium greyish brown, massive, dense, dry [Glacial Till].	
1.0	944.0						
2.0	943.0						
		G B	TP14-046-1			End of Test Pit: 2.6 m Refusal on dense material	
3.0	942.0						
4.0	941.0						
5.0	940.0						

GENERAL REMARKS:
Walls stable, no groundwater, very difficult to excavate.

SAMPLING SYMBOLS:
G B GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-46

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-047
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 26 Jul 14

Location: North Embankment
Total Depth: 2.5 m
Date Completed: 26 Jul 14

Coordinates: 682,196 E , 5,607,876 N UTM NAD83 ZONE10
Elevation: 959.3 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	959.0					**TOPSOIL/ORGANICS** (0 to 0.3) ORGANICS, root mat; and TOPSOIL; SAND and SILT; some gravel, fine to coarse grained, sub angular to rounded; trace clay; poorly graded, non plastic, dark becoming medium brown, loose becoming dense, dry.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.3 m 0.3 m - C: 0.3 - 0.5 m
1.0	958.0					**SILTY SANDY GRAVEL** (0.3 to 2.5) Silty sandy GRAVEL, fine to coarse grained, sub angular to rounded; some cobbles, sub angular to rounded; trace boulders up to 80 cm in diameter; well graded, non plastic, medium greyish brown, very dense, dry. [Glacial Till]	
2.0	957.0						
2.5						End of Test Pit: 2.5 m Refusal on dense material / boulders	
3.0	956.0						
4.0	955.0						
5.0	954.0						

GENERAL REMARKS:
Walls stable, no groundwater, very difficult to excavate from 1 m.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-47

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Contractor: Cobra Contracting Ltd.
Location: North Embankment
Coordinates: 682,196 E , 5,607,881 N UTM NAD83 ZONE10

Test Pit No.: TP14-048
Equipment Used: CAT 320D
Total Depth: 3.4 m
Elevation: 959.5 m

Page: 1 of 1
Date Started: 26 Jul 14
Date Completed: 26 Jul 14
Logged by: MAP
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	959.0					**TOPSOIL/ORGANICS** (0 to 0.3) ORGANICS, root mat; and TOPSOIL; Silty SAND, fine to coarse grained; trace gravel, fine to coarse grained, sub angular to rounded; poorly graded, non plastic, dark brown, loose, root inclusion to 1.5 m, dry.	0 m - A: 0 - 0.3 m
1.0	958.0					**SILTY GRAVELLY SAND** (0.3 to 1) Silty gravelly SAND, fine to coarse grained, angular to sub rounded; trace cobbles up to 10 cm in diameter; well graded, non plastic, medium brown, massive, dense, dry.	
2.0	957.0					**SILTY GRAVELLY SAND** (1 to 3.4) Silty gravelly SAND, fine to coarse grained, angular to sub rounded; trace cobbles; well graded, low to no plasticity, medium brown, massive, very dense, dry. [Glacial Till]	
3.0							
4.0	956.0					End of Test Pit: 3.4 m Refusal on dense material	
5.0	955.0						
	954.0						

GENERAL REMARKS:
Walls stable, no groundwater, difficult to excavate from 1 m.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-48

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-049
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 26 Jul 14

Location: North Embankment
Total Depth: 4 m
Date Completed: 26 Jul 14

Coordinates: 682,071 E , 5,608,061 N UTM NAD83 ZONE10
Elevation: 964.7 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	964.0					**TOPSOIL/ORGANICS** (0 to 0.3) ORGANICS, root mat; and TOPSOIL; Sandy SILT; trace gravel, fine grained; poorly graded, non plastic, dark brown, loose, root inclusions to 0.3 m, dry.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.3 m 0.3 m - C: 0.3 - 0.5 m
						GRAVELLY SAND (0.3 to 4) Gravelly SAND, fine to coarse grained; some silt; trace cobbles, sub angular to sub rounded; gravel up to 5 cm in diameter; well graded, non plastic, medium brown, massive, dense, dry. [Glacial Till]	
1.0	963.0						
2.0	962.0						
3.0	961.0	G B	TP14-049-1				
4.0	960.0					End of Test Pit: 4 m Refusal on dense material	
5.0	959.0						

GENERAL REMARKS:
Walls stable, no groundwater, difficult to excavate from 1 m.

SAMPLING SYMBOLS:
G B GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-49

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-050
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 26 Jul 14

Location: North Embankment
Total Depth: 2.9 m
Date Completed: 26 Jul 14

Coordinates: 682,701 E , 5,607,945 N UTM NAD83 ZONE10
Elevation: 961.2 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	961.0					**TOPSOIL/ORGANICS** (0 to 0.2) ORGANICS, root mat; and TOPSOIL; Sandy SILT; trace gravel, fine to coarse grained, sub angular to rounded; poorly graded, non plastic, medium dark brown, loose, root inclusions, dry.	0 m - A: 0 - 0.2 m
1.0	960.0					**SILTY SAND AND GRAVEL** (0.2 to 2.9) Silty SAND and GRAVEL, fine to coarse grained; trace cobbles up to 15 cm in diameter, sub angular to sub rounded; well graded, non plastic, light to medium brown, massive, dense, dry. [Glacial Till]	
2.0	959.0						
3.0	958.0					End of Test Pit: 2.9 m Refusal on dense material	
4.0	957.0						
5.0	956.0						

GENERAL REMARKS:
Walls stable, no groundwater, difficult to excavate.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-50

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-051
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 26 Jul 14

Location: North Embankment
Total Depth: 4.1 m
Date Completed: 26 Jul 14

Coordinates: 682,508 E , 5,608,121 N UTM NAD83 ZONE10
Elevation: 964.5 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	964.0					**TOPSOIL/ORGANICS** (0 to 0.3) ORGANICS, root mat; and TOPSOIL; Sandy SILT; trace gravel, fine to coarse grained, angular to rounded; poorly graded; non plastic; dark brown; loose; dry.	0 m - A: 0 - 0.3 m 0.3 m - B: 0.3 - 0.5 m 0.5 m - C: 0.5 - 0.9 m
						SANDY GRAVEL (0.3 to 0.9) Sandy GRAVEL; fine to coarse grained, angular to sub rounded; some silt; well graded, non plastic, greyish brown, massive, dense, dry.	
1.0	963.0	G B	TP14-051-1			**SILTY GRAVELLY SAND** (0.9 to 4.1) Silty gravelly SAND, fine to coarse grained; trace cobbles, sub angular to rounded; well graded, low to no plasticity, slightly cohesive, greyish brown, massive, very dense, dry [Glacial Till].	
2.0	962.0						
3.0	961.0						
4.0	960.0					End of Test Pit: 4.1 m Refusal on dense material	
5.0	959.0						

GENERAL REMARKS:
Walls sloughing slightly from 0 - 1 m, no groundwater, difficult to excavate.

SAMPLING SYMBOLS:
G B GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-51

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, TEST PIT LOG, 2014 KP DATA TEMPLATE REVB.GDT, 17-Mar-15

Project: AJAX PROJECT
Test Pit No.: TP14-052
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 28 Jul 14

Location: Downstream of North Embankment
Total Depth: 1.4 m
Date Completed: 28 Jul 14

Coordinates: 682,362 E , 5,608,263 N UTM NAD83 ZONE10
Elevation: 964.3 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	964.0					**TOPSOIL/ORGANICS** (0 to 0.2) ORGANICS, root mat; and TOPSOIL; Silty SAND, fine to coarse grained; trace gravel, fine grained, rounded to sub angular; poorly graded, non plastic, dark brown, loose, root inclusions to 1 m, dry.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.3 m 0.3 m - C: 0.3 - 0.5 m
1.0	963.0					**SILTY GRAVELLY SAND** (0.2 to 1.2) Silty GRAVEL and SAND, fine to coarse grained; trace cobbles, angular to sub rounded; well graded, non plastic, not cohesive, medium greyish brown, massive, very dense, dry. [Colluvium]	
						WEATHERED BEDROCK (1.2 to 1.4) Weathered bedrock encountered 1.2 m.	
2.0	962.0					End of Test Pit: 1.4 m Refusal on bedrock	
3.0	961.0						
4.0	960.0						
5.0	959.0						

GENERAL REMARKS:
Walls sloughing slightly, no groundwater, difficult to excavate past 0.5 m.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-52

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-053
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 28 Jul 14

Location: Downstream of North Embankment
Total Depth: 2.9 m
Date Completed: 28 Jul 14

Coordinates: 682,169 E , 5,608,266 N UTM NAD83 ZONE10
Elevation: 938.5 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	938.0					**TOPSOIL/ORGANICS** (0 to 0.5) ORGANICS, root mat; and TOPSOIL; Sandy SILT; trace gravel, fine grained, angular to sub rounded; poorly graded, non plastic, dark brown, loose, minimal root inclusions to 0.4 m, dry.	0 m - A: 0 - 0.3 m 0.3 m - B: 0.3 - 0.5 m
1.0	937.0					**GRAVELLY SAND** (0.5 to 2.9) Gravelly SAND, fine to coarse grained, sub angular to sub rounded; some silt; trace cobbles, sub angular to sub rounded; trace clay; well graded, medium greyish brown, massive, dense, dry. [Glacial Till]	
2.0	936.0	G B	TP14-053-1				
3.0	935.0					End of Test Pit: 2.9 m Refusal on weathered bedrock	
4.0	934.0						
5.0	933.0						

GENERAL REMARKS:
Wall stable, no groundwater, easy to excavate.

SAMPLING SYMBOLS:
G B GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-53

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, TEST PIT LOG, 2014 KP DATA TEMPLATE REVB.GDT, 17-Mar-15

Project: AJAX PROJECT
Test Pit No.: TP14-054
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 28 Jul 14

Location: Downstream of North Embankment
Total Depth: 1.95 m
Date Completed: 28 Jul 14

Coordinates: 682,066 E , 5,608,462 N UTM NAD83 ZONE10
Elevation: 933 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	933.0					**TOPSOIL/ORGANICS** (0 to 0.2) ORGANICS, root mat; and TOPSOIL; Sandy SILT; trace gravel, fine grained, sub angular to rounded; poorly graded, non plastic, dark brown, loose, dry.	0 m - A: 0 - 0.2 m
						GRAVELLY SAND (0.2 to 1.85) Gravelly SAND, fine to coarse grained; some silt; trace boulders and cobbles up to 80 cm in diameter, angular to sub rounded; well graded, non plastic, slightly cohesive, brown, massive, dense, dry. [Glacial Till]	
1.0	932.0						
2.0	931.0					**WEATHERED BEDROCK** (1.85 to 1.9) angular, gravel to cobble sized fragments, dark grey, strong, moderately weathered.	
						End of Test Pit: 1.95 m Refusal on weathered bedrock	
3.0	930.0						
4.0	929.0						
5.0	928.0						

GENERAL REMARKS:
Walls sloughing slightly, no groundwater, easy to excavate up to 1.4 m, bedrock outcrop visible around test pit.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-54

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, TEST PIT LOG, 2014 KP DATA TEMPLATE REVB.GDT, 17-Mar-15

Project: AJAX PROJECT
Test Pit No.: TP14-055
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 28 Jul 14

Location: Downstream of North Embankment
Total Depth: 1.5 m
Date Completed: 28 Jul 14

Coordinates: 682,266 E , 5,608,466 N UTM NAD83 ZONE10
Elevation: 971.5 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	971.5					**TOPSOIL/ORGANICS** (0 to 0.4) ORGANICS, root mat; and TOPSOIL; Sandy SILT; trace gravel, fine to coarse grained; poorly graded, non plastic, dark brown, loose, root inclusions to 0.5 m, dry.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.4 m
	971.0					**SILTY SAND AND GRAVEL** (0.4 to 1.45) Silty SAND and GRAVEL, fine to coarse grained, angular to sub rounded; trace cobbles, angular to sub rounded; well graded, non plastic, medium greyish brown, very dense, dry. [Glacial Till]	
1.0		G B	TP14-055-1				
	970.0					**WEATHERED BEDROCK** (1.45 to 1.5) dark grey, strong, highly fractured, slightly weathered, oxide staining.	
2.0						End of Test Pit: 1.5 m Refusal on weathered bedrock	
	969.0						
3.0							
	968.0						
4.0							
	967.0						
5.0							
	966.0						

GENERAL REMARKS:
Walls sloughing slightly , no groundwater, easy to excavate up to 1 m.

SAMPLING SYMBOLS:
G B GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-55

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, TEST PIT LOG, 2014 KP DATA TEMPLATE REVB.GDT, 17-Mar-15

Project: AJAX PROJECT
Test Pit No.: TP14-056
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 28 Jul 14

Location: Downstream of North Embankment
Total Depth: 1.6 m
Date Completed: 28 Jul 14

Coordinates: 682,464 E , 5,608,457 N UTM NAD83 ZONE10
Elevation: 994.8 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	994.8					**TOPSOIL/ORGANICS** (0 to 0.4) ORGANICS, root mat; and TOPSOIL; Sandy SILT; some gravel, fine to coarse grained; poorly graded, non plastic, dark brown, very dense, dry.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.4 m 0.4 m - C: 0.4 - 0.7 m
						SAND AND GRAVEL (0.4 to 1.6) SAND and GRAVEL, fine to coarse grained, angular to sub rounded; some silt; trace cobbles, angular to sub rounded; well graded, non plastic, brown, massive, very dense, dry. [Fluvial]	
1.0	994.0						
2.0	993.0					**WEATHERED BEDROCK** (1.6 to 1.6) dark grey, strong, slightly weathered, minor oxide staining, fractured into gravel sized pieces from excavation. End of Test Pit: 1.6 m Refusal on bedrock	
3.0	992.0						
4.0	991.0						
5.0	990.0						
	989.0						

GENERAL REMARKS:
Walls sloughing slightly, no groundwater, easy to excavate up to 1 m.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-56

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-057
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 30 Jul 14

Location: Downstream of North Embankment
Total Depth: 1.4 m
Date Completed: 30 Jul 14

Coordinates: 681,860 E , 5,608,462 N UTM NAD83 ZONE10
Elevation: 923.5 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	923.0					**TOPSOIL/ORGANICS** (0 to 0.3) ORGANICS, root mat; and TOPSOIL; Sandy SILT; trace gravel, fine to coarse grained; poorly graded, non plastic, medium dark brown, loose, dry.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.3 m 0.3 m - C: 0.3 - 0.4 m
						SAND AND GRAVEL (0.3 to 0.4) SAND and GRAVEL, fine to coarse grained, angular to sub rounded; some silt; well graded, non plastic, light grey, massive, very dense, dry. [Fluvial]	
1.0						**WEATHERED BEDROCK** (0.4 to 1.4) dark grey, strong, highly fractured, slightly weathered, oxide staining.	
	922.0					End of Test Pit: 1.4 m Refusal on weathered bedrock	
2.0							
	921.0						
3.0							
	920.0						
4.0							
	919.0						
5.0							
	918.0						

GENERAL REMARKS:
Walls stable, no groundwater, difficult to excavate after 0.4 m.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-57

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-058
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 30 Jul 14

Location: Downstream of North Embankment
Total Depth: 0.8 m
Date Completed: 30 Jul 14

Coordinates: 681,765 E , 5,608,651 N UTM NAD83 ZONE10
Elevation: 927.8 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	927.8					**TOPSOIL/ORGANICS** (0 to 0.3) ORGANICS, root mat; and TOPSOIL; Silty SAND, fine to coarse grained; trace gravel, fine to coarse grained, angular to sub rounded; poorly graded, non plastic, dark brown, loose, dry.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.3 m 0.3 m - C: 0.3 - 0.5 m
	927.0					**SAND AND GRAVEL** (0.3 to 0.5) SAND and GRAVEL; fine to coarse grained, angular to sub rounded; some silt; well graded, non plastic, medium brown, massive, dense, dry.	
1.0						**WEATHERED BEDROCK** (0.5 to 0.8) dark grey, strong, oxide staining.	
	926.0					End of Test Pit: 0.8 m Refusal on weathered bedrock	
2.0							
	925.0						
3.0							
	924.0						
4.0							
	923.0						
5.0							
	922.0						

GENERAL REMARKS:
Walls stable, no groundwater, difficult to excavate from 0.5 m onwards.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-58

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-059
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 30 Jul 14

Location: Downstream of North Embankment
Total Depth: 3 m
Date Completed: 30 Jul 14

Coordinates: 681,963 E , 5,608,270 N UTM NAD83 ZONE10
Elevation: 936.2 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	936.0					**TOPSOIL/ORGANICS** (0 to 0.6) ORGANICS, root mat; and TOPSOIL; Sandy SILT; trace gravel, fine to coarse grained, sub angular to rounded; poorly graded, dark brown, loose becoming dense, root inclusions to 0.7 m, dry.	0 m - A: 0 - 0.4 m 0.4 m - B: 0.4 - 0.6 m
1.0	935.0					**GRAVELLY SAND** (0.6 to 3) Gravelly SAND, fine to coarse grained, angular to sub rounded; some silt; trace cobbles, angular to sub rounded; well graded, non plastic, slightly cohesive, medium greyish brown, massive, very dense, dry [Glacial Till].	
2.0	934.0	G B	TP14-059-1				
3.0	933.0					End of Test Pit: 3 m Refusal on dense material	
4.0	932.0						
5.0	931.0						

GENERAL REMARKS:
Walls stable, no groundwater, easy to excavate.

SAMPLING SYMBOLS:
G B GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-59

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-060
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 30 Jul 14

Location: Downstream of North Embankment
Total Depth: 0.3 m
Date Completed: 30 Jul 14

Coordinates: 682,384 E , 5,608,623 N UTM NAD83 ZONE10
Elevation: 982.3 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	982.0					**TOPSOIL/ORGANICS** (0 to 0.1) ORGANICS, root mat; and TOPSOIL; SAND and SILT, fine grained; trace gravel, fine grained, angular to sub rounded; poorly graded, non plastic, dark brown, loose, root inclusions, dry.	0 m - A: 0 - 0.1 m
						WEATHERED BEDROCK (0.1 to 0.3) dark grey, completely rubblized by excavation, very strong, slightly weathered to fresh, oxidization staining.	
1.0	981.0					End of Test Pit: 0.3 m Refusal on weathered bedrock	
2.0	980.0						
3.0	979.0						
4.0	978.0						
5.0	977.0						

GENERAL REMARKS:
Walls stable, no groundwater, difficult to excavate.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-60

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-061
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 30 Jul 14

Location: South of Jacko Lake
Total Depth: 1.3 m
Date Completed: 30 Jul 14

Coordinates: 682,167 E , 5,608,659 N UTM NAD83 ZONE10
Elevation: 960.9 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	960.0					**TOPSOIL/ORGANICS** (0 to 0.1) ORGANICS, root mat; and TOPSOIL; Silty gravelly SAND, fine to coarse grained, angular to sub rounded, poorly graded, non plastic, dark brown, loose, root inclusions, dry.	0 m - A: 0 - 0.1 m
						WEATHERED BEDROCK (0.1 to 1.3) medium greyish brown with some orange oxidization staining, slightly weathered, rubblized by excavation, walls look massive, no layering.	
1.0		GB	TP14-061-1				
	959.0					End of Test Pit: 1.3 m Refusal on bedrock	
2.0							
	958.0						
3.0							
	957.0						
4.0							
	956.0						
5.0							
	955.0						

GENERAL REMARKS:
Walls stable, no groundwater, difficult to excavate.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-61

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-062
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 30 Jul 14

Location: Downstream of North Embankment
Total Depth: 3.7 m
Date Completed: 30 Jul 14

Coordinates: 681,973 E , 5,608,672 N UTM NAD83 ZONE10
Elevation: 946.6 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	946.6					**TOPSOIL/ORGANICS** (0 to 0.2) ORGANICS; root mat; and TOPSOIL; Silty SAND, fine to coarse grained; trace gravel, fine to coarse grained, angular to sub rounded; poorly graded, non plastic, dark brown, loose, root inclusions, dry.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.3 m 0.3 m - C: 0.3 - 0.4 m
	946.0					**SILTY SAND AND GRAVEL** (0.2 to 0.7) Silty SAND and GRAVEL, fine to coarse grained, angular to sub rounded; trace cobbles, angular to sub rounded; well graded, non plastic, medium brown, dense, dry.	
1.0						**SILTY GRAVELLY SAND** (0.7 to 3.7) Silty gravelly SAND, fine to coarse grained, angular to rounded; trace cobbles, angular to rounded; well graded, non plastic, medium greyish brown, massive, very dense, dry [Glacial Till].	
	945.0						
2.0							
	944.0						
3.0							
	943.0	G B	TP14-062-1			End of Test Pit: 3.7 m Refusal on dense material	
4.0							
	942.0						
5.0							
	941.0						

GENERAL REMARKS:
Difficult to excavate 1 m onwards.

SAMPLING SYMBOLS:
G B GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-62

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, TEST PIT LOG, 2014 KP DATA TEMPLATE REVB.GDT, 17-Mar-15

Project: AJAX PROJECT
Test Pit No.: TP14-063
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 31 Jul 14

Location: South of Jacko Lake
Total Depth: 4.4 m
Date Completed: 31 Jul 14

Coordinates: 682,315 E , 5,609,053 N UTM NAD83 ZONE10
Elevation: 908.7 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	908.7					**TOPSOIL/ORGANICS** (0 to 0.3) ORGANICS, root mat; and TOPSOIL; Sandy SILT; trace gravel, fine to coarse grained, rounded; poorly graded, non plastic, loose, dry.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.3 m 0.3 m - C: 0.3 - 0.5 m
	908.0					**SAND AND GRAVEL** (0.3 to 0.5) SAND and GRAVEL, fine to coarse grained, angular to sub rounded; some silt; well graded, non plastic, light greyish brown, massive, dense, dry.	
1.0						**SANDY SILT AND GRAVEL** (0.5 to 4.4) Sandy SILT and GRAVEL, fine to coarse grained, angular to sub rounded; trace cobbles, angular to sub rounded, trace clay; well graded, low plasticity, cohesive, dark greyish brown, massive, very dense, dry. [Glacial Till]	
	907.0						
2.0							
	906.0						
3.0							
	905.0						
4.0		G B	TP14-063-1			End of Test Pit: 4.4 m Limit of excavator	
	904.0						
5.0							
	903.0						

GENERAL REMARKS:
Walls sloughing slightly, no groundwater, easy to excavate becoming slightly more difficult towards bottom of pit.

SAMPLING SYMBOLS:
G B GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-63

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-064
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 31 Jul 14

Location: South of Jacko Lake
Total Depth: 2.2 m
Date Completed: 31 Jul 14

Coordinates: 682,544 E , 5,609,039 N UTM NAD83 ZONE10
Elevation: 928.8 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	928.8					**TOPSOIL/ORGANICS** (0 to 0.1) ORGANICS, root mat; and TOPSOIL; Silty SAND, fine to coarse grained; trace gravel, fine to coarse grained, sub angular to rounded; poorly graded, non plastic, medium brown, loose, dry,	0 m - A: 0 - 0.1 m 0.1 m - C: 0.1 - 0.6 m
1.0	928.0					**SILTY SAND AND GRAVEL** (0.1 to 2.2) Silty SAND and GRAVEL, fine to coarse grained, angular to sub rounded; trace cobbles, angular to sub rounded; well graded, non plastic, greyish brown, massive, dense, dry. [Glacial Till]	
2.0	927.0						
2.2	926.8					End of Test Pit: 2.2 m Refusal on dense material	
3.0	926.0						
4.0	925.0						
5.0	924.0						
	923.0						

GENERAL REMARKS:
Walls sloughing slightly, no groundwater, difficult to excavate.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-64

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, TEST PIT LOG, 2014 KP DATA TEMPLATE REVB.GDT, 17-Mar-15

Project: AJAX PROJECT
Test Pit No.: TP14-065
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 31 Jul 14

Location: South of Jacko Lake
Total Depth: 4.5 m
Date Completed: 31 Jul 14

Coordinates: 682,434 E , 5,609,182 N UTM NAD83 ZONE10
Elevation: 907.9 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	907.9					**TOPSOIL/ORGANICS** (0 to 0.4) ORGANICS, root mat; and TOPSOIL; SILT; some sand, fine to coarse grained; some gravel, fine to coarse grained, sub angular to rounded; poorly graded, non plastic, dark brown, loose, root inclusions to 0.4 m, dry.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.4 m 0.4 m - C: 0.4 - 1.0 m
1.0	907.0					**SILTY SAND AND GRAVEL** (0.4 to 1) Silty SAND and GRAVEL, fine to coarse grained, sub angular to sub rounded; well graded, non plastic, not cohesive, medium brown, massive, very dense, dry.	
						GRAVELLY SILTY SAND (1 to 4.5) gravelly silty SAND, fine to coarse grained; fine to coarse grained, angular to rounded; some silt; trace cobbles, angular to rounded; well graded, non plastic, not cohesive, light brownish grey, massive, dense, dry. [Glacial Till]	
2.0	906.0						
3.0	905.0						
4.0	904.0	G B	TP14-065-1				
						End of Test Pit: 4.5 m Limit of excavator	
5.0	903.0						
	902.0						

GENERAL REMARKS:
Walls stable, no groundwater, easy to excavate.

SAMPLING SYMBOLS:
G B GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-65

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, TEST PIT LOG, 2014 KP DATA TEMPLATE REVB.GDT, 17-Mar-15

Project: AJAX PROJECT
Test Pit No.: TP14-066
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 31 Jul 14

Location: South of Jacko Lake
Total Depth: 3.4 m
Date Completed: 31 Jul 14

Coordinates: 682,710 E , 5,609,152 N UTM NAD83 ZONE10
Elevation: 923.6 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	923.6					**TOPSOIL/ORGANICS** (0 to 0.5) ORGANICS; root mat; and TOPSOIL; SILT; some sand, fine to coarse grained; trace gravel, fine to coarse grained, sub angular to rounded; poorly graded, non plastic, dark becoming medium brown, massive, loose, dry.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.5 m 0.5 m - C: 0.5 - 0.8 m
	923.0					**SAND AND GRAVEL** (0.5 to 0.8) SAND and GRAVEL, fine to coarse grained, angular to sub rounded; some silt; trace cobbles, angular to sub rounded; well graded, non plastic, dark grey/brown, massive, dense, not cohesive, dry.	
1.0						**SILTY SAND** (0.8 to 3.4) Silty SAND; some gravel, fine to coarse grained, sub angular to sub rounded; trace cobbles, sub angular to sub rounded; well graded, non plastic, not cohesive, dark grey/brown, massive, dense, dry. [Glacial Till]	
	922.0						
2.0							
	921.0						
3.0							
	920.0					End of Test Pit: 3.4 m Refusal on dense material	
4.0							
	919.0						
5.0							
	918.0						

GENERAL REMARKS:
Walls sloughing slightly, no groundwater, easy to excavate up to 2 m.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-66

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, TEST PIT LOG, 2014 KP DATA TEMPLATE REVB.GDT, 17-Mar-15

Project: AJAX PROJECT | **Test Pit No.:** TP14-067 | **Page:** 1 of 1

Contractor: Cobra Contracting Ltd. | Equipment Used: CAT 320D | Date Started: 31 Jul 14

Location: South of Jacko Lake | Total Depth: 4.3 m | Date Completed: 31 Jul 14

Coordinates: 682,718 E , 5,608,950 N UTM NAD83 ZONE10 | Elevation: 948.5 m | Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	948.5					**TOPSOIL/ORGANICS** (0 to 0.2) ORGANICS, root mat; and TOPSOIL; SILT; some sand, fine to coarse grained; trace gravel, fine to coarse grained, rounded to sub angular; poorly graded, non plastic, dark/medium brown, loose, dry.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.4 m 0.4 m - C: 0.4 - 0.6 m
	948.0					**SAND AND SILT** (0.2 to 0.4) SILT and SAND, fine to coarse grained; some gravel, fine to coarse grained, sub angular to sub rounded; poorly graded, non plastic, medium brown, massive, dense, dry.	
1.0						**SAND AND GRAVEL** (0.4 to 0.6) SAND and GRAVEL, fine to coarse grained, angular to rounded; some silt; well graded, non plastic, light greyish brown, massive, dense, dry.	
	947.0					**SILTY GRAVELLY SAND** (0.6 to 4.3) Silty gravelly SAND, fine to coarse grained, angular to rounded; trace cobbles, sub angular to sub rounded; well graded, low to no plasticity, cohesive, dark greyish brown, massive, very dense, dry [Glacial Till].	
2.0							
	946.0						
3.0							
	945.0						
4.0		G B	TP14-067-1				
	944.0					End of Test Pit: 4.3 m Refusal on dense material	
5.0							
	943.0						

GENERAL REMARKS:

Walls stable, no groundwater, easy to excavate up to 2 m.

SAMPLING SYMBOLS:

G B GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-67

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-068
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 1 Aug 14

Location: South of Jacko Lake
Total Depth: 3.1 m
Date Completed: 1 Aug 14

Coordinates: 682,896 E , 5,609,071 N UTM NAD83 ZONE10
Elevation: 927.6 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	927.6					**TOPSOIL/ORGANICS** (0 to 0.3) ORGANICS, root mat; and TOPSOIL; SILT; some sand, fine grained; trace gravel, fine to coarse grained, angular to rounded; poorly graded, non plastic, medium brown, loose, dry.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.3 m 0.3 m - C: 0.3 - 2.5 m
						SANDY GRAVEL (0.3 to 2.5) Sandy GRAVEL, fine to coarse grained, sub angular to rounded; some silt; trace cobbles, sub angular to rounded; well graded, non plastic, light grey, massive, very dense, dry.	
1.0	927.0						
2.0	926.0						
3.0	925.0	G B	TP14-068-1			**GRAVELLY SAND** (2.5 to 3.1) Gravelly SAND, fine to coarse grained, sub angular to rounded; some silt; trace cobbled, sub angular to rounded; well graded, non plastic, not cohesive, greyish brown, massive, very dense, dry [Glacial Till].	
4.0	924.0					End of Test Pit: 3.1 m Refusal on dense material	
5.0	923.0						
	922.0						

GENERAL REMARKS:
Walls sloughing slightly, no groundwater, difficult to excavate.

SAMPLING SYMBOLS:
G B GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-68

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-069
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 1 Aug 14

Location: South of Jacko Lake
Total Depth: 3.4 m
Date Completed: 1 Aug 14

Coordinates: 683,122 E , 5,609,056 N UTM NAD83 ZONE10
Elevation: 897.2 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	897.0					**TOPSOIL/ORGANICS** (0 to 0.5) ORGANICS, root mat; and TOPSOIL; Sandy SILT; trace gravel, fine to coarse grained, sub angular to rounded; poorly graded, non plastic, dark brown, loose, root and decaying wood inclusions, dry.	0 m - A: 0 - 0.3 m 0.3 m - B: 0.3 - 0.5 m 0.5 m - C: 0.5 - 1.0 m
		G B	GP14-001			**SILTY SAND** (0.5 to 1) silty SAND; some gravel, fine to coarse grained, angular to sub rounded; some silt; trace cobbles, angular to sub rounded; poorly graded, non plastic, light grey, massive, very dense, dry.	
1.0	896.0					**SILTY SAND** (1 to 3.4) Silty SAND; some boulders; some cobbles; some gravel, fine to coarse grained, angular to rounded; well graded, non plastic, dark greyish brown, very dense, moist to saturated, ground water encountered at 3.2 m. [Glacial Till]	
2.0	895.0						
3.0	894.0				▼		3.2 m - Groundwater Seepage at 3.2 m
						End of Test Pit: 3.4 m Boulders / groundwater	
4.0	893.0						
5.0	892.0						

GENERAL REMARKS:
GP14-001, walls sloughing at 2 m, groundwater at 3.2 m, difficult to excavate.

SAMPLING SYMBOLS:
G B GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-69

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-070
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 1 Aug 14

Location: South of Jacko Lake
Total Depth: 3.3 m
Date Completed: 1 Aug 14

Coordinates: 683,214 E , 5,609,088 N UTM NAD83 ZONE10
Elevation: 893.4 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	893.0					**TOPSOIL/ORGANICS** (0 to 0.2) ORGANICS; root mat; and TOPSOIL; SILT; some sand, fine to coarse grained; trace gravel, fine to coarse grained, sub angular to rounded; poorly graded, non plastic, dark becoming medium brown, massive, loose, dry.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.3 m
1.0	892.0					**SAND AND GRAVEL** (0.2 to 1.6) GRAVEL and SAND, fine to coarse grained, rounded to sub angular; some silt; some cobbles, rounded to sub angular; well graded, non plastic, greyish brown, massive, dense, dry.	
2.0	891.0					**SILTY SAND AND GRAVEL** (1.6 to 3.3) Silty SAND and GRAVEL, fine to coarse grained, rounded to sub angular; trace cobbles, rounded to sub angular, well graded, non plastic, grey/brown, dense, moist to saturated, water encountered at 3.3 m. [Glaciofluvial]	
3.0		G B	TP14-070-1		▼		3.2 m - Groundwater Seepage at 3.2 m
	890.0					End of Test Pit: 3.3 m Walls sloughing / groundwater	
4.0	889.0						
5.0	888.0						

GENERAL REMARKS:
Walls sloughing slightly, groundwater at 3.2 m, easy to excavate.

SAMPLING SYMBOLS:
G B GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-70

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-071
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 1 Aug 14

Location: South of Jacko Lake
Total Depth: 4.9 m
Date Completed: 1 Aug 14

Coordinates: 682,481 E , 5,608,843 N UTM NAD83 ZONE10
Elevation: 934.8 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	934.8					**TOPSOIL/ORGANICS** (0 to 0.6) ORGANICS, root mat; and TOPSOIL; SILT; some sand, fine to coarse grained; trace gravel, fine to coarse grained, sub angular to rounded; poorly graded, non plastic, dark to medium brown, loose becoming dense, dry.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.6 m 0.6 m - C: 0.6 - 0.9 m
1.0	934.0					**SILTY SAND** (0.6 to 0.9) Silty SAND, fine to coarse grained; some gravel, fine to coarse grained, angular to rounded; trace cobbles, sub angular to rounded; poorly graded, non plastic, greyish brown, massive, dry.	
2.0	933.0					**SILTY GRAVELLY SAND** (0.9 to 4.9) Silty gravelly SAND, fine to coarse grained, angular to sub rounded; some cobbles, angular to sub rounded; well graded, low plasticity, dark greyish brown, massive, very dense, dry [Glacial Till].	
3.0	932.0						
4.0	931.0						
	930.0	G B	TP14-071-1				
5.0	929.0					End of Test Pit: 4.9 m Limit of excavator	

GENERAL REMARKS:
Walls stable, no groundwater, easy to excavate.

SAMPLING SYMBOLS:
G B GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-71

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-072
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 1 Aug 14

Location: Downstream of North Embankment
Total Depth: 5 m
Date Completed: 1 Aug 14

Coordinates: 682,564 E , 5,608,667 N UTM NAD83 ZONE10
Elevation: 940.8 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	940.0					**TOPSOIL/ORGANICS** (0 to 0.5) ORGANICS, root mat; and TOPSOIL; SILT, some sand, fine to coarse grained; trace gravel, fine to coarse grained, sub angular to rounded; poorly graded, non plastic, dark brown, loose, root inclusions to 0.5 m, dry.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.5 m 0.5 m - C: 0.5 - 1 m
1.0	939.0					**SAND AND GRAVEL** (0.5 to 1) SAND and GRAVEL, fine to coarse grained, rounded to sub angular; some silt; trace cobbles, rounded to sub angular; poorly graded, non plastic, dark grey/brown, massive, dense.	
2.0	938.0					**GRAVELLY SILT AND SAND** (1 to 5) Gravelly SILT and SAND, fine to coarse grained, angular to rounded; trace clay; trace cobbles, angular to rounded; well graded, low plasticity, dark grey/brown, cohesive, massive, very dense, dry [Glacial Till].	
3.0	937.0						
4.0	936.0						
5.0	935.0					End of Test Pit: 5 m Limit of excavator	

GENERAL REMARKS:
Walls stable, no groundwater, easy to excavate.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-72

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-073
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 2 Aug 14

Location: Downstream of North Embankment
Total Depth: 4.7 m
Date Completed: 2 Aug 14

Coordinates: 682,813 E , 5,608,566 N UTM NAD83 ZONE10
Elevation: 929.5 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	929.0					**TOPSOIL/ORGANICS** (0 to 0.5) ORGANCIS, root mat; and TOPSOIL; SILT; some sand, fine to coarse grained; trace gravel, fine to coarse grained, sub angular to rounded, poorly graded, non plastic, dark brown, loose, root inclusions to 0.8 m, dry.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.5 m
						SAND AND GRAVEL (0.5 to 0.9) SAND and GRAVEL, fine to coarse grained, sub rounded to rounded; some silt; well graded, non plastic, medium brown, massive, compact, dry.	0.5 m - C: 0.5 - 0.9 m
1.0		G B	GP14-002			**SANDY GRAVELLY SILT** (0.9 to 4.7) Sandy Gravelly SILT; trace cobbles, angular to rounded; well graded, low to medium plasticity, dark grey, massive, cohesive, dense, dry [Glacial Till].	
	928.0						
2.0							
	927.0						
3.0							
	926.0						
4.0							
	925.0					End of Test Pit: 4.7 m Limit of excavator	
5.0							
	924.0						

GENERAL REMARKS:
GP14-002, walls sloughing (loose gravel), no groundwater, easy to excavate.

SAMPLING SYMBOLS:
G B GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-73

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-074
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 2 Aug 14

Location: South of Jacko Lake
Total Depth: 4.8 m
Date Completed: 2 Aug 14

Coordinates: 683,183 E , 5,608,933 N UTM NAD83 ZONE10
Elevation: 932.4 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	932.0					**TOPSOIL/ORGANICS** (0 to 0.6) ORGANICS, root mat; and TOPSOIL; SILT; some sand, fine to medium grained; trace gravel, fine to medium grained, sub angular to rounded; poorly graded, non plastic, dark brown, loose, root inclusions to 0.3 m, dry.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.6 m 0.6 m - C: 0.6 - 1.0 m
1.0	931.0					**GRAVELLY SAND AND SILT** (0.6 to 1) Gravelly SAND and SILT, fine to coarse grained, angular to sub rounded; trace cobbles, angular to sub rounded; well graded, non plastic, greyish brown, massive, dense, dry **GRAVELLY SILT** (1 to 4.8) Gravelly SILT; some sand, fine to coarse grained; trace clay; trace cobbles, sub angular to rounded; well graded, medium plasticity, greyish brown, massive, cohesive, dry [Glacial Till].	
2.0	930.0						
3.0	929.0						
4.0	928.0						
4.8	927.6	G B	TP14-074-1			End of Test Pit: 4.8 m Limit of excavator	
5.0	927.0						

GENERAL REMARKS:
Walls sloughing slightly from 0 - 1.5 m, no groundwater, easy to excavate up to 2 m.

SAMPLING SYMBOLS:
G B GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-74

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-075
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 2 Aug 14

Location: South of Jacko Lake
Total Depth: 4.2 m
Date Completed: 2 Aug 14

Coordinates: 682,993 E , 5,608,913 N UTM NAD83 ZONE10
Elevation: 955 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
						TOPSOIL/ORGANICS (0 to 0.3) ORGANICS, root mat; and TOPSOIL; SILT; some sand, fine to coarse grained; trace gravel, fine to coarse grained; sub angular to rounded; trace cobbles up to 15 cm in diameter, sub angular to rounded; poorly graded, non plastic, dark brown, loose, root inclusions to 1.2 m, dry.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.3 m
1.0	954.0					**SILTY SAND AND GRAVEL** (0.3 to 4.2) Silty SAND and GRAVEL, fine to coarse grained, sub angular to rounded; well graded, non plastic, dark greyish brown, not cohesive, massive, dense, dry [Glacial Till].	
2.0	953.0						
3.0	952.0						
4.0	951.0					End of Test Pit: 4.2 m Limit of excavator	
5.0	950.0						

GENERAL REMARKS:
Walls sloughing in from 0 - 1.2 m, no groundwater, easy to excavate.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-75

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-076
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 2 Aug 14

Location: South of Jacko Lake
Total Depth: 5 m
Date Completed: 2 Aug 14

Coordinates: 682,875 E , 5,608,889 N UTM NAD83 ZONE10
Elevation: 938.6 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	938.0					**TOPSOIL/ORGANICS** (0 to 0.2) ORGANICS, root mat; and TOPSOIL; SILT, some sand, fine to coarse grained; trace gravel, fine to coarse grained, sub angular to rounded; poorly graded, non plastic, medium brown, lots, root inclusions to 0.5 m, dry.	0 m - A: 0 - 0.2 m
1.0	937.0					**SILTY SAND AND GRAVEL** (0.2 to 5) Silty SAND and GRAVEL, fine to coarse grained, angular to sub rounded; trace clay; trace cobbles, sub angular to sub rounded; well graded, non plastic, dark greyish brown, dry to moist, cohesive [Glacial Till].	
2.0	936.0						
3.0	935.0						
4.0	934.0	G B	TP14-076-1				
5.0	933.0					End of Test Pit: 5 m Limit of excavator	

GENERAL REMARKS:
Walls stable, no groundwater, easy to excavate.

SAMPLING SYMBOLS:
G B GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-76

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-077
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 2 Aug 14

Location: North Embankment
Total Depth: 4.7 m
Date Completed: 2 Aug 14

Coordinates: 682,902 E , 5,608,404 N UTM NAD83 ZONE10
Elevation: 932.4 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	932.0					**TOPSOIL/ORGANICS** (0 to 0.4) ORGANICS, root mat; and TOPSOIL; SILT; some sand, fine to coarse grained; trace gravel, fine to coarse grained, sub angular to rounded; poorly graded, non plastic, medium grey/brown, loose, root inclusions, dry.	0 m - A: 0 - 0.4 m
1.0	931.0					**SANDY GRAVEL** (0.4 to 2) Sandy GRAVEL, fine to coarse grained, sub angular to rounded; some cobbles, sub angular to rounded, well graded, non plastic, greyish brown, massive, loose, dry. [Glaciofluvial]	
2.0	930.0					**SILTY GRAVELLY SAND** (2 to 4.7) Silty gravelly SAND, fine to coarse grained; trace cobbles, angular to rounded; well graded, non plastic, greyish brown, massive, very dense, cohesive, dry to moist [Glacial Till].	
3.0	929.0						
4.0	928.0						
5.0	927.0					End of Test Pit: 4.7 m Limit of excavator	

GENERAL REMARKS:
Walls sloughing in from 0 - 1.1 m, no groundwater, easy to excavate up to 2 m.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-77

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, TEST PIT LOG, 2014 KP DATA TEMPLATE REVB.GDT, 17-Mar-15

Project: AJAX PROJECT
Test Pit No.: TP14-078
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 3 Aug 14

Location: North Embankment
Total Depth: 1.7 m
Date Completed: 3 Aug 14

Coordinates: 683,008 E , 5,608,410 N UTM NAD83 ZONE10
Elevation: 951.5 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	951.5					**TOPSOIL/ORGANICS** (0 to 0.4) ORGANICS, root mat; and TOPSOIL; Silty SAND, fine to coarse grained; some gravel, fine to coarse grained, sub angular to rounded; poorly graded, non plastic, medium to dark brown, loose to compact, root inclusions to 1.0 m, dry.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.4 m 0.4 m - C: 0.4 - 0.7 m
1.0	950.5					**SILTY GRAVELLY SAND** (0.4 to 0.7) Silty gravelly SAND, fine to coarse grained, angular to rounded; well graded, non plastic, light grey, massive, dense, dry.	
						GRAVELLY SILT AND SAND (0.7 to 1.7) Gravelly SILT and SAND, fine to coarse grained, angular to rounded; trace cobbles, angular to rounded; poorly graded, non plastic, light brown, massive, very dense, dry, very difficult to excavate, dense material and weathered bedrock. [Colluvium]	
2.0	949.5					End of Test Pit: 1.7 m Refusal on bedrock	
3.0	948.5						
4.0	947.5						
5.0	946.5						

GENERAL REMARKS:
Walls stable, no groundwater, easy to excavate up to 1 m.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-78

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, TEST PIT LOG, 2014 KP DATA TEMPLATE REVB.GDT, 17-Mar-15

Project: AJAX PROJECT
Test Pit No.: TP14-079
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 3 Aug 14

Location: North Embankment
Total Depth: 3.4 m
Date Completed: 3 Aug 14

Coordinates: 683,204 E , 5,608,440 N UTM NAD83 ZONE10
Elevation: 965.7 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	965.7					**TOPSOIL/ORGANICS** (0 to 0.1) ORGANICS, root mat; and TOPSOIL; Sandy SILT; trace gravel, fine to coarse grained, sub angular to rounded; poorly graded, non plastic, dark brown, massive, loose, root inclusions to 0.8 m, dry.	0 m - A: 0 - 0.1 m
1.0	965.0					**SILTY SAND AND GRAVEL** (0.1 to 3.4) Silty SAND and GRAVEL, fine to coarse grained, angular to sub rounded; trace cobbles and boulders, angular to sub rounded; well graded, non plastic, light greyish brown, massive, very dense, dry, cobbles and boulders possibly weathered bedrock. [Glacial Till]	
2.0	964.0						
3.0	963.0						
3.4	962.3					End of Test Pit: 3.4 m Refusal on dense material / bedrock	
4.0	962.0						
5.0	961.0						
	960.0						

GENERAL REMARKS:
Walls stable, no groundwater, easy to excavate.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-79

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, TEST PIT LOG, 2014 KP DATA TEMPLATE REVB.GDT, 17-Mar-15

Project: AJAX PROJECT
Test Pit No.: TP14-080
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 3 Aug 14

Location: North Embankment
Total Depth: 0.8 m
Date Completed: 3 Aug 14

Coordinates: 683,424 E , 5,608,435 N UTM NAD83 ZONE10
Elevation: 965.9 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	965.9					**TOPSOIL/ORGANICS** (0 to 0.1) ORGANICS, root mat; and TOPSOIL; Sandy SILT, fine to coarse grained sand; trace gravel, fine to coarse grained, angular to sub rounded; poorly graded, non plastic, medium dark brown, loose, root inclusions to 0.5 m, dry.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.5 m
		G B	TP14-080-1			**SILTY GRAVELLY SAND** (0.1 to 0.8) Silty gravelly SAND, fine to coarse grained; trace cobbles up to 20 cm in diameter, angular to rounded; well graded, non plastic, light greyish brown, massive, dense, dry. [Colluvium]	
1.0	965.0					**WEATHERED BEDROCK** (0.8 to 0.8) dark grey, strong, slightly weathered, minor oxide staining, fractured into gravel sized pieces from excavation. End of Test Pit: 0.8 m Refusal on weathered bedrock	
2.0	964.0						
3.0	963.0						
4.0	962.0						
5.0	961.0						
	960.0						

GENERAL REMARKS:
No groundwater, difficult to excavate, bedrock outcrop visible nearby.

SAMPLING SYMBOLS:
G B GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-80

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, TEST PIT LOG, 2014 KP DATA TEMPLATE REVB.GDT, 17-Mar-15

Project: AJAX PROJECT
Test Pit No.: TP14-081
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 3 Aug 14

Location: North Embankment
Total Depth: 1.4 m
Date Completed: 3 Aug 14

Coordinates: 683,412 E , 5,608,292 N UTM NAD83 ZONE10
Elevation: 956.8 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	956.8					**TOPSOIL/ORGANICS** (0 to 0.1) ORGANICS, root mat; and TOPSOIL; SAND and SILT, fine to coarse grained; trace gravel, fine to coarse grained, rounded to sub angular; poorly graded, non plastic, medium to dark brown, loose, root inclusions to 0.9 m, dry.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.6 m
						SILTY SAND (0.1 to 0.6) Silty SAND, fine to coarse grained; trace gravel, fine to coarse grained, angular to sub rounded; trace cobbles, angular to sub rounded; gap graded, non plastic, medium brown, massive, dense, dry.	
1.0	956.0					**SILTY SAND AND GRAVEL** (0.6 to 1.4) Silty SAND and GRAVEL, fine to coarse grained, angular to sub rounded; trace cobbles, angular to sub rounded; poorly graded, non plastic, greyish brown, massive, very dense, dry. [Colluvium]	
1.4	955.4					End of Test Pit: 1.4 m Refusal on dense material / bedrock	
2.0	955.0						
	954.0						
3.0							
	953.0						
4.0							
	952.0						
5.0							
	951.0						

GENERAL REMARKS:
Walls stable, no groundwater, difficult to excavate from 0.5 m onwards.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-81

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, TEST PIT LOG, 2014 KP DATA TEMPLATE REVB.GDT, 17-Mar-15

Project: AJAX PROJECT
Test Pit No.: TP14-082
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 3 Aug 14

Location: North Embankment
Total Depth: 2.3 m
Date Completed: 3 Aug 14

Coordinates: 683,209 E , 5,608,199 N UTM NAD83 ZONE10
Elevation: 973.2 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	973.0					**TOPSOIL/ORGANICS** (0 to 0.2) ORGANICS, root mat; and TOPSOIL; SILT; some sand, fine to coarse grained; trace gravel, fine to coarse grained, angular to sub rounded; poorly graded, non plastic, loose, root inclusions to 0.4 m, dry.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.4 m 0.4 m - C: 0.4 - 0.8 m
						SILTY SAND AND GRAVEL (0.2 to 0.8) Silty SAND and GRAVEL, fine to coarse grained, angular to sub rounded; trace cobbles, angular to sub rounded; well graded, non plastic, light grey, massive, dense, dry.	
1.0	972.0					**SILTY SAND** (0.8 to 2.3) Silty SAND, fine to coarse grained; some gravel, fine to coarse grained, sub angular to sub rounded; trace cobbles, sub angular to sub rounded; poorly graded, non plastic, light greyish brown, massive, not cohesive, very dense, dry. [Glacial Till]	
2.0	971.0	G B	TP14-082-1			End of Test Pit: 2.3 m Refusal on dense material	
3.0	970.0						
4.0	969.0						
5.0	968.0						

GENERAL REMARKS:
Walls stable, no groundwater, very difficult to excavate.

SAMPLING SYMBOLS:
G B GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-82

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, TEST PIT LOG, 2014 KP DATA TEMPLATE REVB.GDT, 17-Mar-15

Project: AJAX PROJECT
Test Pit No.: TP14-083
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 3 Aug 14

Location: North Embankment
Total Depth: 4.6 m
Date Completed: 3 Aug 14

Coordinates: 683,262 E , 5,608,059 N UTM NAD83 ZONE10
Elevation: 965.6 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	965.0					**TOPSOIL/ORGANICS** (0 to 0.3) ORGANICS, root mat; and TOPSOIL; Silty SAND, fine to coarse grained, angular to rounded; poorly graded, non plastic, dark brown, loose, root inclusions to 0.3 m, dry.	0 m - A: 0 - 0.3 m
						GRAVELLY SAND AND SILT (0.3 to 2) Gravelly sandy SILT; trace cobbles, angular to sub rounded; poorly graded, non plastic, dark brown, loose, root inclusions to 0.3 m, dry.	
1.0		G B	GP14-003				
	964.0						
2.0						**GRAVELLY SILT AND SAND** (2 to 4.6) Gravelly silty SAND, fine to coarse grained; trace cobbles, sub angular to rounded; trace clay; well graded, low plasticity, cohesive, dark grey/brown, massive, dense, moist to dry [Glacial Till].	
	963.0						
3.0							
	962.0						
4.0		G B	TP14-085-1				
	961.0					End of Test Pit: 4.6 m Limit of excavator	
5.0							
	960.0						

GENERAL REMARKS:
GP14-003, no groundwater, difficult to excavate from 1 m onwards.

SAMPLING SYMBOLS:
G B GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-83

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, TEST PIT LOG, 2014 KP DATA TEMPLATE REVB.GDT, 17-Mar-15

Project: AJAX PROJECT
Test Pit No.: TP14-084
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 3 Aug 14

Location: TSF Basin
Total Depth: 4.1 m
Date Completed: 3 Aug 14

Coordinates: 683,305 E , 5,607,884 N UTM NAD83 ZONE10
Elevation: 971.1 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	971.0					**TOPSOIL/ORGANICS** (0 to 0.5) ORGANCIS, root mat; and TOPSOIL; Sandy SILT; trace gravel, fine to coarse grained, sub angular to rounded; poorly graded, non plastic, dark brown, loose, dry.	0 m - A: 0 - 0.3 m 0.3 m - B: 0.3 - 0.5 m 0.5 m - C: 0.5 - 0.9 m
1.0	970.0					**SILTY SAND AND GRAVEL** (0.5 to 1.5) Silty SAND and GRAVEL, fine to coarse grained, angular to rounded; trace cobbles, angular to rounded; well graded, non plastic, light to dark grey, massive, dense, dry.	
2.0	969.0					**SILTY SAND AND GRAVEL** (1.5 to 4.1) Silty SAND and GRAVEL, fine to coarse grained, angular to rounded; trace cobbles, angular to rounded; well graded, non plastic, cohesive, light to dark grey, massive, dense, moist. [Glacial Till]	
3.0	968.0						
4.0	967.0					End of Test Pit: 4.1 m Limit of excavator	
5.0	966.0						

GENERAL REMARKS:
Walls sloughing slightly to 1.4 m, no groundwater, easy to excavate to 1.4 m.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-84

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, TEST PIT LOG, 2014 KP DATA TEMPLATE REVB.GDT, 17-Mar-15

Project: AJAX PROJECT
Test Pit No.: TP14-085
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 5 Aug 14

Location: TSF Basin
Total Depth: 3.8 m
Date Completed: 5 Aug 14

Coordinates: 683,444 E , 5,607,742 N UTM NAD83 ZONE10
Elevation: 957.3 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	957.0					**TOPSOIL/ORGANICS** (0 to 0.5) ORGANICS, root mat; and TOPSOIL; SILT; some sand, fine to coarse grained; trace gravel, fine to coarse grained, angular to sub rounded; poorly graded, non plastic, dark to medium brown, loose becoming dense, root inclusions, dry.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.5 m 0.5 m - C: 0.5 - 2 m
1.0	956.0					**SILTY SAND AND GRAVEL** (0.5 to 2) Silty SAND and GRAVEL, fine to coarse grained, sub angular to rounded; trace cobbles, sub angular to rounded; well graded, non plastic, light greyish brown, massive, dense, dry.	
2.0	955.0					**SILTY GRAVELLY SAND** (2 to 3.8) Silty gravelly SAND, fine to coarse grained, angular to sub rounded; trace cobbles, angular to sub rounded; well graded, non plastic, not cohesive, greyish brown, massive, dense, dry. [Colluvium]	
3.0	954.0		TP14-085-1				
4.0	953.0					End of Test Pit: 3.8 m Refusal on dense material	
5.0	952.0						

GENERAL REMARKS:
Walls stable, no groundwater, very difficult to excavate.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-85

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, TEST PIT LOG, 2014 KP DATA TEMPLATE REVB.GDT, 17-Mar-15

Project: AJAX PROJECT
Contractor: Cobra Contracting Ltd.
Location: TSF Basin
Coordinates: 683,723 E , 5,607,548 N UTM NAD83 ZONE10

Test Pit No.: TP14-086
Equipment Used: CAT 320D
Total Depth: 0.6 m
Elevation: 964.9 m

Page: 1 of 1
Date Started: 5 Aug 14
Date Completed: 5 Aug 14
Logged by: MAP
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	964.9					**TOPSOIL/ORGANICS** (0 to 0.2) ORGANICS, root mat; and TOPSOIL; SILT; some sand, fine to coarse grained; trace gravel, fine to coarse grained, sub angular to rounded; poorly graded, non plastic, medium brown, massive, loose, root inclusions, dry.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.6 m
1.0	964.0					**SILTY GRAVELLY SAND** (0.2 to 0.6) Silty gravelly SAND, fine to coarse grained; trace cobbles, angular to sub angular; well graded, non plastic, medium greyish brown, massive, dense, dry, angular cobbles possibly weathered bedrock. [Colluvium]	
						WEATHERED BEDROCK (0.6 to 0.6) dark grey, angular, slightly weathered, strong, minor oxide staining. End of Test Pit: 0.6 m Refusal on weathered bedrock	
2.0	963.0						
3.0	962.0						
4.0	961.0						
5.0	960.0						
	959.0						

GENERAL REMARKS:
Walls sloughing, no groundwater, difficult to excavate.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-86

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, TEST PIT LOG, 2014 KP DATA TEMPLATE REVB.GDT, 17-Mar-15

Project: AJAX PROJECT
Test Pit No.: TP14-087
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 5 Aug 14

Location: TSF Basin
Total Depth: 3.7 m
Date Completed: 5 Aug 14

Coordinates: 683,687 E , 5,607,713 N UTM NAD83 ZONE10
Elevation: 961.5 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	961.0					**TOPSOIL/ORGANICS** (0 to 0.3) ORGANICS, root mat; and TOPSOIL; SILT; some sand, fine to coarse grained; some gravel, fine to coarse grained, angular to sub rounded; well graded, non plastic, medium brown/grey, massive, dense, dry.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.3 m 0.3 m - C: 0.3 - 0.5 m
						SILTY SAND AND GRAVEL (0.3 to 3.7) Silty SAND and GRAVEL, fine to coarse grained, angular to sub rounded; trace cobbles, angular to sub rounded; well graded, low to no plasticity, cohesive, dark grey/brown, massive, very dense, dry. [Glacial Till]	
1.0	960.0	G B	GP14-004				
2.0	959.0						
3.0	958.0	G B	TP14-087-1				
						End of Test Pit: 3.7 m Refusal on dense material	
4.0	957.0						
5.0	956.0						

GENERAL REMARKS:
GP14-004, walls sloughing slightly to 1.5 m, no groundwater, difficult to excavate from 1 m onwards.

SAMPLING SYMBOLS:
G B GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-87

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, TEST PIT LOG, 2014 KP DATA TEMPLATE REVB.GDT, 17-Mar-15

Project: AJAX PROJECT
Test Pit No.: TP14-088
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 5 Aug 14

Location: TSF Basin
Total Depth: 0.8 m
Date Completed: 5 Aug 14

Coordinates: 683,583 E , 5,607,869 N UTM NAD83 ZONE10
Elevation: 992.4 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	992.0					**TOPSOIL/ORGANICS** (0 to 0.4) ORGANICS, root mat; and TOPSOIL; SILT; some sand, fine to coarse grained; trace gravel, fine to coarse grained, sub angular to rounded; poorly graded, non plastic, dark brown, loose, root inclusions to .4 m, dry.	0 m - A: 0 - 0.4 m 0.4 m - B: 0.4 - 0.6 m
1.0	991.0					**SILTY SAND AND GRAVEL** (0.4 to 0.8) Silty SAND and GRAVEL, fine to coarse grained, angular to sub rounded; trace cobbles up to 25 cm in diameter, angular to sub rounded; well graded, non plastic, medium greyish brown, massive, dense, dry. [Colluvium]	
2.0	990.0					**WEATHERED BEDROCK** (0.8 to 0.8) dark grey, strong, slightly weathered, minor oxide staining, fractured into gravel sized pieces from excavation. End of Test Pit: 0.8 m Refusal on bedrock	
3.0	989.0						
4.0	988.0						
5.0	987.0						

GENERAL REMARKS:
Walls sloughing, no groundwater, easy to excavate up to 0.8 m.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-88

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-089
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 5 Aug 14

Location: TSF Basin
Total Depth: 2.7 m
Date Completed: 5 Aug 14

Coordinates: 683,562 E , 5,607,593 N UTM NAD83 ZONE10
Elevation: 946 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
						TOPSOIL/ORGANICS (0 to 1) ORGANICS, root mat; and TOPSOIL; SILT and SAND, fine to coarse grained; trace gravel, fine to medium grained, angular to sub rounded; poorly graded, non plastic, very dark brown, massive, loose to compact, root inclusions down to 1.4 m, moist to saturated.	0 m - A: 0 - 1.0 m
1.0	945.0					**SAND AND SILT** (1 to 1.5) SILT and SAND, fine to coarse grained; trace gravel, fine to coarse grained, angular to sub rounded; trace clay; poorly graded, low plasticity, light grey, massive, compact, saturated. [Colluvium / Highly Weathered Bedrock]	
					▼	**SANDY SILT** (1.5 to 2.7) Sandy SILT; some gravel, fine to coarse grained, angular to rounded; trace clay; poorly graded, medium to high plasticity, yellow/orange/greyish colour, massive, compact, saturated. [Colluvium / Highly Weathered Bedrock]	1.5 m - Groundwater Seepage at 1.5 m
2.0	944.0						
		G B	TP14-089-1			End of Test Pit: 2.7 m Walls sloughing / groundwater	
3.0	943.0						
4.0	942.0						
5.0	941.0						

GENERAL REMARKS:
Walls sloughing, groundwater at 1.5 m, very easy to excavate.

SAMPLING SYMBOLS:
G B GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-89

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-090
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 5 Aug 14

Location: TSF Basin
Total Depth: 5.1 m
Date Completed: 5 Aug 14

Coordinates: 683,466 E , 5,607,548 N UTM NAD83 ZONE10
Elevation: 953.4 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	953.0					**TOPSOIL/ORGANICS** (0 to 0.1) ORGANICS, root mat; and TOPSOIL; SILT; some sand, fine to coarse grained; trace gravel, fine to coarse grained, sub angular to rounded; poorly graded, non plastic, medium brown, loose, root inclusions, dry.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.4 m 0.4 m - C: 0.4 - 0.7 m
1.0	952.0					**SAND AND SILT** (0.1 to 1.2) SAND and SILT, fine grained; some cobbles, angular to sub rounded; trace gravel, fine grained, angular to sub rounded; trace clay; gap graded, low plasticity, light greyish brown, massive, very dense, dry.	
2.0	951.0					**SILTY SAND AND GRAVEL** (1.2 to 5.1) Silty SAND and GRAVEL, fine to coarse grained, angular to sub rounded; some cobbles, angular to sub rounded, trace boulders; well graded, low to no plasticity, cohesive, dark greyish brown, massive, dense, dry to moist [Glacial Till].	
3.0	950.0						
4.0	949.0						
5.0	948.0	G B	TP14-090-1			End of Test Pit: 5.1 m Limit of excavator	

GENERAL REMARKS:
Walls stable, no groundwater, easy to excavate to 5.1 m.

SAMPLING SYMBOLS:
G B GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-90

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-091
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 6 Aug 14

Location: North Embankment
Total Depth: 4 m
Date Completed: 6 Aug 14

Coordinates: 683,156 E , 5,607,801 N UTM NAD83 ZONE10
Elevation: 945.2 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	945.0					**TOPSOIL/ORGANICS** (0 to 0.2) ORGANICS, root mat; and TOPSOIL; SILT; some sand, fine to coarse grained; trace gravel, fine to coarse grained, sub angular to rounded; poorly graded, non plastic, dark to medium brown, loose to compact, root inclusions, dry.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.2 m 0.2 m - C: 0.2 - 0.8 m
						GRAVELLY SAND AND SILT (0.2 to 0.8) Gravelly SAND and SILT, fine to coarse grained, angular to sub rounded; trace cobbles, angular to rounded; well graded, non plastic, medium greyish brown, massive, dense, dry.	
1.0	944.0					**SILTY GRAVELLY SAND** (0.8 to 4) Silty gravelly SAND, fine to coarse grained, angular to sub rounded; trace clay; trace cobbles, angular to sub rounded; well graded, non plastic, dark greyish brown, massive, cohesive, very dense, dry to moist [Glacial Till].	
2.0	943.0						
3.0	942.0						
		G B	TP14-091-1				
4.0	941.0					End of Test Pit: 4 m Limit of excavator	
5.0	940.0						

GENERAL REMARKS:
Walls stable, no groundwater, easy to excavate.

SAMPLING SYMBOLS:
G B GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-91

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-092
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 6 Aug 14

Location: North Embankment
Total Depth: 5 m
Date Completed: 6 Aug 14

Coordinates: 683,071 E , 5,607,986 N UTM NAD83 ZONE10
Elevation: 947.2 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	947.0					**TOPSOIL/ORGANICS** (0 to 0.3) ORGANICS, root mat; and TOPSOIL; SILT and SAND; trace gravel, fine to coarse grained, angular to rounded; poorly graded, non plastic, dark brown, loose, dry.	0 m - A: 0 - 0.3 m 0.3 m - C: 0.3 - 0.9 m
						SILTY SAND AND GRAVEL (0.3 to 0.9) Silty SAND and GRAVEL, fine to coarse grained, angular to sub rounded; trace cobbles, angular to sub rounded; well graded, non plastic, cohesive, greyish brown, massive, very dense, dry.	
1.0	946.0					**SILTY GRAVELLY SAND** (0.9 to 5) Silty gravelly SAND, fine to coarse grained, sub angular to sub rounded; trace cobbles, sub angular to sub rounded; gap graded, non plastic, not cohesive, medium brown/grey, massive, dense, dry. [Colluvium?]	
2.0	945.0						
3.0	944.0						
4.0	943.0						
5.0	942.0					End of Test Pit: 5 m Limit of excavator	

GENERAL REMARKS:
Walls stable, no groundwater, easy to excavate.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-92

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-093
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 6 Aug 14

Location: North Embankment
Total Depth: 3 m
Date Completed: 6 Aug 14

Coordinates: 683,064 E , 5,608,171 N UTM NAD83 ZONE10
Elevation: 969.5 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	969.0					**TOPSOIL/ORGANICS** (0 to 0.3) ORGANICS, root mat; and TOPSOIL; SILT; some sand, trace gravel, fine gravel; poorly graded, non plastic, medium dark brown, loose, dry.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.3 m 0.3 m - C: 0.3 - 0.8 m
						SILTY GRAVELLY SAND (0.3 to 0.8) Silty gravelly SAND, fine to coarse grained, angular to sub angular; poorly graded, non plastic, medium brown, very dense, dry.	
1.0						**SILTY SAND AND GRAVEL** (0.8 to 3) Silty SAND and GRAVEL, fine to coarse grained, angular to sub rounded; some cobbles, trace boulders, trace clay; well graded, non plastic, dark grey/brown, massive, cohesive, very dense, dry [Glacial Till].	
	968.0						
2.0							
	967.0						
3.0		G B	TP14-093-1			End of Test Pit: 3 m Refusal on dense material	
	966.0						
4.0							
	965.0						
5.0							
	964.0						

GENERAL REMARKS:
Walls stable, no groundwater, difficult to excavate from 0.5 m onwards.

SAMPLING SYMBOLS:
G B GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-93

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-094
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 6 Aug 14

Location: North Embankment
Total Depth: 2.3 m
Date Completed: 6 Aug 14

Coordinates: 682,855 E , 5,608,080 N UTM NAD83 ZONE10
Elevation: 957.3 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	957.0					**TOPSOIL/ORGANICS** (0 to 0.3) ORGANICS, root mat; and TOPSOIL; SILT; trace sand, fine to coarse grained; trace gravel, fine grained, sub angular to rounded; poorly graded, non plastic, medium brown, loose, root inclusions, dry.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.3 m 0.3 m - C: 0.3 - 0.9 m
1.0						**SILTY SAND AND GRAVEL** (0.3 to 0.9) Silty SAND and GRAVEL, fine to coarse grained, angular to sub rounded; trace cobbles, sub angular to sub rounded; well graded, non plastic, light greyish brown, massive, very dense, dry.	
	956.0					**SILTY GRAVELLY SAND** (0.9 to 2.3) Silty gravelly SAND, fine to coarse grained, angular to sub rounded; some cobbles, angular to sub rounded; well graded, non plastic, medium greyish brown, massive, very dense, dry. [Colluvium?]	
2.0	955.0	G B	TP14-094-1			End of Test Pit: 2.3 m Refusal on dense material	
3.0	954.0						
4.0	953.0						
5.0	952.0						

GENERAL REMARKS:
Walls stable, no groundwater, difficult to excavate from 0.5 m onwards.

SAMPLING SYMBOLS:
G B GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-94

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-095
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 7 Aug 14

Location: North Embankment
Total Depth: 3 m
Date Completed: 7 Aug 14

Coordinates: 682,661 E , 5,608,246 N UTM NAD83 ZONE10
Elevation: 982.7 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	982.7					**TOPSOIL/ORGANICS** (0 to 0.4) ORGANICS, root mat; and TOPSOIL; SILT; some sand; trace gravel, fine to medium grained, sub angular to rounded; poorly graded, non plastic, dark brown, loose, root inclusions, dry.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.4 m 0.4 m - C: 0.4 - 0.7 m
	982.0					**SAND AND GRAVEL** (0.4 to 0.7) SAND and GRAVEL, fine to coarse grained, angular to sub rounded some silt; trace cobbles, angular to sub rounded; well graded, non plastic, light grey, massive, dense, dry.	
1.0		G B	TP14-095-1			**SILTY SAND AND GRAVEL** (0.7 to 3) Silty SAND and GRAVEL, fine to coarse grained, angular to sub rounded; some cobbles, angular to sub rounded; well graded, low to no plasticity, cohesive, dark greyish brown, massive, very dense, moist [Glacial Till].	
	981.0						
2.0							
	980.0						
3.0						End of Test Pit: 3 m Refusal on dense material	
	979.0						
4.0							
	978.0						
5.0							
	977.0						

GENERAL REMARKS:
Walls stable, no groundwater, difficult to excavate from 0.5 m onwards.

SAMPLING SYMBOLS:
G B GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-95

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-096
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 7 Aug 14

Location: Downstream of North Embankment
Total Depth: 3 m
Date Completed: 7 Aug 14

Coordinates: 682,663 E , 5,608,440 N UTM NAD83 ZONE10
Elevation: 988.3 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	988.0					**TOPSOIL/ORGANICS** (0 to 0.3) ORGANICS, root mat; and TOPSOIL; SILT; some SAND, fine to coarse grained, sub angular to rounded; poorly graded, non plastic, dark brown, loose becoming dense, root inclusions, dry.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.3 m 0.3 m - C: 0.3 - 0.5 m
1.0	987.0					**SILTY GRAVELLY SAND** (0.3 to 3) Silty gravelly SAND, fine to coarse grained, angular to sub rounded; trace cobbles, angular to sub rounded; trace clay; well graded, low plasticity, dark greyish brown, massive, very dense, dry to moist [Glacial Till].	
2.0	986.0						
3.0	985.0					End of Test Pit: 3 m Refusal on bedrock / dense material	
4.0	984.0						
5.0	983.0						

GENERAL REMARKS:
Walls stable, no groundwater, difficult to excavate from 1 m onwards.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-96

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-097
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 7 Aug 14

Location: TSF Basin
Total Depth: 4.7 m
Date Completed: 7 Aug 14

Coordinates: 682,973 E , 5,607,632 N UTM NAD83 ZONE10
Elevation: 946 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
						TOPSOIL/ORGANICS (0 to 0.1) ORGANICS, root mat; and TOPSOIL; SILT; some sand; trace gravel, fine to coarse grained, sub angular to rounded; poorly graded, non plastic, dark brown, loose, root inclusions, dry.	0 m - A: 0 - 0.1 m
		G B	GP14-005			**SAND AND SILT** (0.1 to 0.9) SAND and SILT; trace gravel, fine grained, angular to sub rounded; poorly graded, non plastic, medium brown, massive, loose to compact, trace root inclusions, dry.	
1.0	945.0					**SANDY GRAVELLY SILT** (0.9 to 4.7) Sandy GRAVEL; SILT; trace cobbles; trace clay, fine to coarse grained, angular to sub rounded; well graded, medium plasticity, dark grey/brown, massive, very dense, dry to moist [Glacial Till].	
2.0	944.0						
3.0	943.0						
4.0	942.0						
		G B	TP14-097-1			End of Test Pit: 4.7 m Limit of excavator	
5.0	941.0						

GENERAL REMARKS:
GP14-005, walls stable, no groundwater, easy to excavate.

SAMPLING SYMBOLS:
G B GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-97

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-098
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 7 Aug 14

Location: North Embankment
Total Depth: 4.3 m
Date Completed: 7 Aug 14

Coordinates: 682,930 E , 5,607,855 N UTM NAD83 ZONE10
Elevation: 952.4 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	952.0					**TOPSOIL/ORGANICS** (0 to 0.3) ORGANICS, root mat; and TOPSOIL; SILT; some sand, fine to coarse grained; trace gravel, fine to coarse grained, angular to rounded; poorly graded, loose, root inclusions, dry.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.3 m 0.3 m - C: 0.3 - 0.5 m
1.0	951.0	G B	GP14-006			**SILTY SAND AND GRAVEL** (0.3 to 0.5) Silty SAND and GRAVEL, fine to coarse grained, angular to sub rounded; trace cobbles, angular to sub rounded; well graded, non plastic, light greyish brown, massive, compact to dense, dry. **SILTY GRAVELLY SAND** (0.5 to 4.3) Silty gravelly SAND, fine to coarse grained, angular to rounded; some cobbles, angular to rounded; well graded, low to medium plasticity, dark greyish brown, massive, very dense, dry to moist [Glacial Till].	
2.0	950.0						
3.0	949.0						
4.0	948.0	G B	TP14-098-1			End of Test Pit: 4.3 m Limit of excavator	
5.0	947.0						

GENERAL REMARKS:
GP14-006, no groundwater, difficult to excavate from 1 m onwards.

SAMPLING SYMBOLS:
G B GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-98

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-099
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 8 Aug 14

Location: TSF Basin
Total Depth: 4.4 m
Date Completed: 8 Aug 14

Coordinates: 683,107 E , 5,607,501 N UTM NAD83 ZONE10
Elevation: 943.7 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	943.0					**TOPSOIL/ORGANICS** (0 to 0.3) ORGANICS, root mat; and TOPSOIL; SILT; some sand; some gravel, fine to coarse grained, sub angular to rounded; poorly graded, non plastic, dark to medium brown, loose to compact, root inclusions, dry.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.3 m 0.3 m - C: 0.3 - 0.6 m
						SANDY GRAVELLY SILT (0.3 to 0.6) Sandy Gravelly SILT; trace cobbles, angular to sub rounded; trace clay; well graded, low to medium plasticity, cohesive, dark greyish brown, massive, moist.	
1.0		G B	GP14-007			**SANDY GRAVELLY SILT** (0.6 to 4.4) Sandy Gravelly SILT; trace cobbles; fine to coarse grained, angular to sub rounded; trace clay; well graded, low to medium plasticity, dark greyish brown, cohesive, massive, moist [Glacial Till].	
	942.0						
2.0							
	941.0						
3.0							
	940.0						
4.0		G B	TP14-099-1			End of Test Pit: 4.4 m Limit of excavator	
	939.0						
5.0							
	938.0						

GENERAL REMARKS:
GP14-007, walls stable, no groundwater, difficult to excavate from 1 m onwards.

SAMPLING SYMBOLS:
G B GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-99

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-100
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 8 Aug 14

Location: TSF Basin
Total Depth: 4.5 m
Date Completed: 8 Aug 14

Coordinates: 683,271 E , 5,607,595 N UTM NAD83 ZONE10
Elevation: 945.3 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	945.0					**TOPSOIL/ORGANICS** (0 to 0.1) ORGANICS, root mat; and TOPSOIL; SILT; some sand, fine to coarse grained; trace gravel, fine to coarse grained, sub angular to rounded; poorly graded, non plastic, dark brown, loose, root inclusions, dry.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.6 m
						SANDY SILT (0.1 to 0.6) Sandy SILT; trace gravel, fine to coarse grained, sub angular to sub rounded; poorly graded, non plastic, greyish brown, massive, compact to dense, dry. [Loess]	
1.0		G B	GP14-008			**GRAVELLY SAND AND SILT** (0.6 to 4.5) Gravelly SAND and SILT, fine to coarse grained; some cobbles, angular to sub rounded; trace clay; well graded, low to medium plasticity, dark greyish brown, cohesive, massive, very dense, dry. [Glacial Till]	
	944.0						
2.0							
	943.0						
3.0							
	942.0						
4.0							
	941.0						
4.5						End of Test Pit: 4.5 m Limit of excavator	
5.0							
	940.0						

GENERAL REMARKS:
GP14-008, walls stable, no groundwater, easy to excavate.

SAMPLING SYMBOLS:
G B GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-100

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-101
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 8 Aug 14

Location: TSF Basin
Total Depth: 4.5 m
Date Completed: 8 Aug 14

Coordinates: 683,327 E , 5,607,402 N UTM NAD83 ZONE10
Elevation: 944 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
						TOPSOIL/ORGANICS (0 to 0.2) ORGANICS, tall grasses with short roots; and TOPSOIL; SILT; trace sand, fine to coarse grained; trace gravel, fine grained, sub angular to rounded; poorly graded, non plastic, medium brown, loose, root inclusions to 0.5 m, dry.	0 m - A: 0 - 0.1 m 0.2 m - B: 0.2 - 0.9 m
						SILT (0.2 to 0.9) SILT; some sand, fine grained; trace gravel, fine grained, sub angular to rounded; trace clay; poorly graded, low plasticity, cohesive, brownish grey, massive, stiff, dry. [Loess]	
1.0	943.0					**SANDY SILT** (0.9 to 4.5) Sandy SILT; some gravel, fine to coarse grained, angular to sub rounded; trace cobbles, sub angular to sub rounded; trace clay; well graded, low to no plasticity, dark greyish brown, massive, very dense, moist. [Glacial Till]	
2.0	942.0						
3.0	941.0						
4.0	940.0	G B	TP14-101-1			End of Test Pit: 4.5 m Limit of excavator	
5.0	939.0						

GENERAL REMARKS:
Walls stable, no groundwater, easy to excavate.

SAMPLING SYMBOLS:
G B GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-101

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-102
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 8 Aug 14

Location: TSF Basin
Total Depth: 4.5 m
Date Completed: 8 Aug 14

Coordinates: 683,387 E , 5,607,357 N UTM NAD83 ZONE10
Elevation: 942.6 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	942.6					**TOPSOIL/ORGANICS** (0 to 0.1) ORGANICS, root mat; and TOPSOIL; SILT; trace sand, fine grained; trace gravel, fine grained, sub angular to rounded; poorly graded, non plastic, medium brown, loose, dry.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 1.5 m
						SILT (0.1 to 1.5) SILT; some sand, fine grained; trace cobbles, angular to sub rounded; trace clay; poorly graded, non plastic, dark greyish brown, massive, cohesive, compact to dense, dry. [Loess]	
1.0	941.0					**SILTY SAND** (1.5 to 4.5) Silty SAND, fine to coarse grained; some gravel, fine to coarse grained, angular to rounded; some cobbles, angular to rounded; trace clay; well graded, low plasticity, dark greyish brown, massive, cohesive, very dense, moist [Glacial Till].	
2.0	940.0						
3.0	939.0						
4.0	938.0					End of Test Pit: 4.5 m Limit of excavator	
5.0	937.0						

GENERAL REMARKS:
Walls stable, no groundwater, easy to excavate.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-102

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-103
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 9 Aug 14

Location: TSF Basin
Total Depth: 4.3 m
Date Completed: 9 Aug 14

Coordinates: 682,936 E , 5,607,392 N UTM NAD83 ZONE10
Elevation: 948.9 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0						**TOPSOIL/ORGANICS** (0 to 0.5) ORGANICS, root mat; and TOPSOIL; SILT, some sand, fine to coarse grained; trace gravel, fine to coarse grained, sub angular to rounded; poorly graded, non plastic, dark brown, loose, root inclusions to 0.1 m, dry.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.5 m 0.5 m - C: 0.5 - 0.9 m
0.5						**SILTY SAND AND GRAVEL** (0.5 to 0.9) Silty SAND and GRAVEL, fine to coarse grained, angular to sub rounded; trace cobbles, angular to sub rounded; well graded, non plastic, light greyish brown, massive, dense, dry.	
1.0	948.0					**SILTY GRAVELLY SAND** (0.9 to 4.3) Silty gravelly SAND, fine to coarse grained; trace cobbles, angular to sub rounded; trace clay; well graded, low plasticity, cohesive, dark greyish brown, massive, dense, dry to moist [Glacial Till].	
2.0	947.0						
3.0	946.0						
4.0	945.0						
4.3						End of Test Pit: 4.3 m Limit of excavator	
5.0	944.0						
	943.0						

GENERAL REMARKS:
Walls stable, no groundwater, easy to excavate.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-103

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-104
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 9 Aug 14

Location: TSF Basin
Total Depth: 4.7 m
Date Completed: 9 Aug 14

Coordinates: 682,984 E , 5,607,211 N UTM NAD83 ZONE10
Elevation: 943.3 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	943.0					**TOPSOIL/ORGANICS** (0 to 0.3) ORGANICS, root mat; and TOPSOIL; SILT and SAND; trace gravel, fine to coarse grained, sub angular to rounded; poorly graded, non plastic, dark brown, loose, root inclusions, dry.	0 m - A: 0 - 0.3 m 0.3 m - C: 0.3 - 0.5 m
						SILTY SAND AND GRAVEL (0.3 to 1.5) Silty SAND and GRAVEL, fine to coarse grained, sub angular to rounded; trace cobbles, rounded; well graded, non plastic, medium greyish brown, massive, dense, dry.	
1.0	942.0						
						SILTY GRAVELLY SAND (1.5 to 4.7) Silty gravelly SAND, fine to coarse grained, sub rounded to angular; trace cobbles, angular to sub rounded; well graded, low to no plasticity, cohesive, dark greyish brown, massive, very dense, dry to moist [Glacial Till].	
2.0	941.0						
3.0	940.0						
4.0	939.0	G B	TP14-104-1				
						End of Test Pit: 4.7 m Limit of excavator	
5.0	938.0						

GENERAL REMARKS:
Walls stable, no groundwater, easy to excavate.

SAMPLING SYMBOLS:
G B GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-104

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-105
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 9 Aug 14

Location: TSF Basin
Total Depth: 2.5 m
Date Completed: 9 Aug 14

Coordinates: 683,153 E , 5,607,268 N UTM NAD83 ZONE10
Elevation: 942.2 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	942.0					**TOPSOIL/ORGANICS** (0 to 0.2) ORGANICS, root mat; and TOPSOIL; Sandy SILT; trace gravel, fine to coarse grained, angular to rounded; poorly graded, non plastic, dark brown, loose, root inclusions, dry.	0 m - A: 0 - 0.2 m
						SANDY GRAVEL (0.2 to 0.5) Sandy GRAVEL, fine to coarse grained, angular to rounded; some silt; trace cobbles, angular to rounded; well graded, non plastic, grey/brown, finely layered, loose, dry. [Glaciofluvial]	
1.0	941.0	G B	TP14-105-1			**SAND** (0.5 to 2.5) SAND, fine to coarse grained; some silty; some gravel, fine to coarse grained, sub angular to rounded; poorly graded, non plastic, medium grey, finely layered, loose to compact, dry. [Glaciofluvial]	
2.0	940.0						
3.0	939.0						
4.0	938.0						
5.0	937.0					End of Test Pit: 2.5 m Walls caving	

GENERAL REMARKS:
Walls sloughing significantly, no groundwater, very easy to excavate.

SAMPLING SYMBOLS:
G B GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-105

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-106
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 9 Aug 14

Location: TSF Basin
Total Depth: 2.9 m
Date Completed: 9 Aug 14

Coordinates: 683,281 E , 5,607,202 N UTM NAD83 ZONE10
Elevation: 940.2 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	940.0					**TOPSOIL/ORGANICS** (0 to 0.5) ORGANICS, root mat, and TOPSOIL; SILT, some sand; trace gravel, fine to coarse grained, angular to sub rounded; poorly graded, non plastic, dark to medium brown, massive, loose to compact, root inclusions to 0.5 m, dry.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.5 m 0.5 m - C: 0.5 - 1.0 m
1.0	939.0					**SAND AND GRAVEL** (0.5 to 1.1) SAND and GRAVEL, fine to coarse grained, angular to sub rounded; some silty; trace cobbles, angular to sub rounded; well graded, low plasticity, medium greyish brown, finely layered, compact, dry. [Glaciofluvial]	
2.0	938.0	GB	TP14-106-1		▼	**SILTY SAND** (1.1 to 2.9) Silty SAND, fine to medium grained; trace gravel, fine grained, sub angular to sub rounded; trace clay; poorly graded, non plastic, orange/yellow brown, stratified, cohesive, loose, saturated. [Glaciofluvial]	2 m - Groundwater Seepage at 2.0 m
3.0	937.0					End of Test Pit: 2.9 m Walls sloughing / groundwater	
4.0	936.0						
5.0	935.0						

GENERAL REMARKS:
Walls caving/sloughing, material is saturated from 2 m onwards, but no visible water in test pit, easy to excavate.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-106

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-107
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 9 Aug 14

Location: TSF Basin
Total Depth: 4.4 m
Date Completed: 9 Aug 14

Coordinates: 683,102 E , 5,607,035 N UTM NAD83 ZONE10
Elevation: 950.1 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	950.0					**TOPSOIL/ORGANICS** (0 to 0.2) ORGANICS, root mat; and TOPSOIL; SILT; some sand, fine to coarse grained; trace gravel, fine to coarse grained, angular to rounded; poorly graded, non plastic, dark brown, loose, root inclusions, dry.	0 m - A: 0 - 0.2 m
1.0	949.0					**SAND AND SILT** (0.2 to 4.4) SILT and SAND, fine grained; trace gravel, fine grained, angular to sub rounded; trace clay; poorly graded, non plastic, light grey becoming dark grey/brown, massive, loose to compact, moist. [Loess]	
2.0	948.0						
3.0	947.0						
4.0	946.0	G B	TP14-107-1			End of Test Pit: 4.4 m Limit of excavator	
5.0	945.0						

GENERAL REMARKS:
Walls stable, no groundwater, very easy to excavate up to 4 m.

SAMPLING SYMBOLS:
G B GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-107

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-108
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 11 Aug 14

Location: TSF Basin
Total Depth: 4.2 m
Date Completed: 11 Aug 14

Coordinates: 682,968 E , 5,606,910 N UTM NAD83 ZONE10
Elevation: 975.9 m
Logged by: MAP/JAS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	975.9					**TOPSOIL/ORGANICS** (0 to 0.1) ORGANICS, root mat; and TOPSOIL; SILT; some sand; trace gravel, fine to coarse grained, angular to rounded; poorly graded, non plastic, dark brown, loose, dry.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.3 m 0.3 m - C: 0.3 - 1 m
						SANDY SILT (0.1 to 0.3) Sandy SILT; trace gravel, fine to coarse grained, angular to sub rounded; poorly graded, non plastic, medium brown, massive, compact, dry. [Loess]	
1.0	975.0					**SILTY GRAVELLY SAND** (0.3 to 1) Silty gravelly SAND, fine to coarse grained; trace cobbles, angular to sub rounded; well graded, non plastic, light brownish grey, massive, dense, dry.	
						SILTY GRAVELLY SAND (1 to 4.2) Silty gravelly SAND, fine to coarse grained; some cobbles, angular to sub rounded; well graded, low plasticity, dark brown/grey, massive, very dense, dry to moist [Glacial Till].	
2.0	974.0						
3.0	973.0						
4.0	972.0						
4.2	971.7					End of Test Pit: 4.2 m Limit of excavator	
5.0	971.0						
	970.0						

GENERAL REMARKS:
Walls stable, no groundwater.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-108

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, TEST PIT LOG, 2014 KP DATA TEMPLATE REVB.GDT, 17-Mar-15

Project: AJAX PROJECT
Test Pit No.: TP14-109
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 11 Aug 14

Location: TSF Basin
Total Depth: 4.1 m
Date Completed: 11 Aug 14

Coordinates: 682,866 E , 5,606,744 N UTM NAD83 ZONE10
Elevation: 991.9 m
Logged by: MAP/JAS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0						**TOPSOIL/ORGANICS** (0 to 0.1) ORGANICS; root mat; and TOPSOIL; SILT; some sand; trace gravel, fine to coarse grained, sub angular to rounded; poorly graded, non plastic, dark brown, massive, loose, dry.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.3 m
1.0	991.0					**SAND AND SILT** (0.1 to 0.5) Sandy SILT; trace gravel; trace cobbles; fine to coarse grained, non-plastic, angular to sub rounded, well graded, medium brown, massive, moderately dense to dense, dry. [Loess]	
						SILTY GRAVEL (0.5 to 1.1) Silty GRAVEL; trace sand; non-plastic, sub rounded to rounded, gap graded, medium brown, massive, moderately dense to dense, dry. [Loess]	
2.0	990.0					**SAND AND SILT** (1.1 to 4.1) Sandy SILT; some gravel; trace cobbles; fine to coarse grained, non-plastic, well graded, brown, massive, very dense, moist. [Loess]	
3.0	989.0						
4.0	988.0	G B	TP14-109-1			End of Test Pit: 4.1 m Limit of excavator	
5.0	987.0						
	986.0						

GENERAL REMARKS:
Walls stable, no groundwater, easy to excavate up to 1.1 m, very dense material from 3.3 m onwards.

SAMPLING SYMBOLS:
G B GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-109

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-110
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 11 Aug 14

Location: TSF Basin
Total Depth: 3.7 m
Date Completed: 11 Aug 14

Coordinates: 683,101 E , 5,606,761 N UTM NAD83 ZONE10
Elevation: 992.4 m
Logged by: MAP/JAS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	992.0					**TOPSOIL/ORGANICS** (0 to 0.3) ORGANICS; root mat; and TOPSOIL; SILT; some sand; trace gravel, fine to coarse grained, sub angular to rounded; poorly graded, non plastic, dark brown, massive, loose, dry.	0 m - A: 0 - 0.3 m 0.3 m - B: 0.3 - 1.4 m
1.0	991.0					**SAND AND SILT** (0.3 to 1.4) Sandy SILT; some gravel; fine to coarse grained, angular to sub rounded, non-plastic, well graded, medium brown, massive, moderately dense, dry. [Loess]	1.4 m - C: 1.4 - 2.4 m
2.0	990.0					**SAND AND SILT** (1.4 to 3.7) Sandy SILT; some gravel; fine to coarse grained, sub rounded, non-plastic, well graded, medium brown, massive, very dense, moist. [Glacial Till]	
3.0	989.0						
4.0	988.0					End of Test Pit: 3.7 m Refusal on dense material	
5.0	987.0						

GENERAL REMARKS:
Walls stable, no groundwater.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-110

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-111
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 11 Aug 14

Location: TSF Basin
Total Depth: 3.5 m
Date Completed: 11 Aug 14

Coordinates: 682,973 E , 5,606,620 N UTM NAD83 ZONE10
Elevation: 1010.8 m
Logged by: MAP/JAS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1010.8					**TOPSOIL/ORGANICS** (0 to 0.1) ORGANICS; root mat; and TOPSOIL; SILT, non plastic, dark brown, loose, dry.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.4 m 0.4 m - C: 0.4 - 0.8 m
						SILTY GRAVEL (0.1 to 0.4) Silty GRAVEL; non-plastic, rounded, gap graded, dark brown, massive, loose, dry.	
1.0	1010.0					**SILT** (0.4 to 3.5) SILT; some sand; some gravel; non-plastic, rounded, well graded, dark brown, moist. [Loess]	
2.0	1009.0						
3.0	1008.0						
4.0	1007.0					End of Test Pit: 3.5 m Limit of excavator	
5.0	1006.0						
	1005.0						

GENERAL REMARKS:
Walls stable, no groundwater.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-111

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-112
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D
Date Started: 11 Aug 14

Location: TSF Basin
Total Depth: 4 m
Date Completed: 11 Aug 14

Coordinates: 683,073 E , 5,606,347 N UTM NAD83 ZONE10
Elevation: 1046.6 m
Logged by: MAP/JAS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1046.6					**TOPSOIL/ORGANICS** (0 to 0.1) ORGANICS; root mat; and TOPSOIL; SILT; some gravel, fine grained, poorly graded, non plastic, dark brown, loose, dry.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.4 m 0.4 m - C: 0.4 - 0.5 m
						SILT (0.1 to 0.4) SILT; some gravel, fine grained, poorly graded, non plastic, dark brown, loose, dry. [Loess]	
1.0	1046.0					**GRAVELLY SILT** (0.4 to 4) gravelly SILT; some sand; non-plastic, sub angular to sub rounded, well graded, medium brown, very dense, moist. [Glacial Till]	
2.0	1045.0						
3.0	1044.0						
4.0	1043.0	G B	TP14-112-1			End of Test Pit: 4 m Limit of excavator	
5.0	1042.0						
	1041.0						

GENERAL REMARKS:
Walls stable, no groundwater.

SAMPLING SYMBOLS:
G B GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-112

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-113
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 12 Aug 14

Location: TSF Basin
Total Depth: 3.7 m
Date Completed: 12 Aug 14

Coordinates: 682,989 E , 5,606,161 N UTM NAD83 ZONE10
Elevation: 1045.8 m
Logged by: JAS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1045.0					**TOPSOIL/ORGANICS** (0 to 0.05) ORGANICS; root mat; and TOPSOIL; SILT; some sand; trace gravel, fine to coarse grained, rounded; poorly graded, non plastic, dark brown, loose, dry.	0 m - A: 0 - 0.05 m 0.05 m - B: 0.05 - 0.2 m 0.2 m - C: 0.2 - 0.4 m
						SILT (0.05 to 0.2) SILT; some sand; trace gravel, fine to coarse grained, rounded; poorly graded, non plastic, dark brown, loose, dry. Sand and gravel content increasing with depth. [Loess]	
1.0						**SILT** (0.2 to 3.7) SILT; some sand; some gravel; non-plastic, sub rounded, well graded, medium brown, moist. [Loess]	
	1044.0						
2.0							
	1043.0						
3.0							
	1042.0					End of Test Pit: 3.7 m Limit of excavator	
4.0							
	1041.0						
5.0							
	1040.0						

GENERAL REMARKS:
Easy to excavate up until 2 m depth. Pit walls stable and open.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-113

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-114
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 12 Aug 14

Location: TSF Basin
Total Depth: 4 m
Date Completed: 12 Aug 14

Coordinates: 682,915 E , 5,606,398 N UTM NAD83 ZONE10
Elevation: 1048.8 m
Logged by: JAS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1048.8					**TOPSOIL/ORGANICS** (0 to 0.2) ORGANICS; root mat; and TOPSOIL; SILT; some sand; trace gravel, rounded; poorly graded, non plastic, dark brown, loose, dry.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.3 m 0.3 m - C: 0.3 - 1 m
						SILT (0.2 to 4) SILT; some medium gravel; non-plastic, sub rounded to rounded, poorly graded, medium brown, moderately dense, dry. [Loess]	
1.0	1048.0						
2.0	1047.0						
3.0	1046.0						
4.0	1045.0					End of Test Pit: 4 m Limit of excavator	
5.0	1044.0						
	1043.0						

GENERAL REMARKS:
Easy to excavate. Pit walls stable and open.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-114

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-115
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 12 Aug 14

Location: TSF Basin
Total Depth: 5 m
Date Completed: 12 Aug 14

Coordinates: 682,732 E , 5,606,530 N UTM NAD83 ZONE10
Elevation: 1104.7 m
Logged by: JAS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1104.7					**TOPSOIL/ORGANICS** (0 to 0.1) ORGANICS; root mat; and TOPSOIL; SILT; some sand; trace gravel, poorly graded, non plastic, medium brown, loose, dry.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.3 m 0.3 m - C: 0.3 - 1.4 m
						SILT (0.1 to 0.3) SILT; some sand; trace gravel, poorly graded, non plastic, medium brown, loose, dry. [Loess]	
1.0	1104.0					**SAND AND SILT** (0.3 to 3) Sandy SILT; some gravel; sub rounded, non-plastic, well graded, medium brown, massive, moderately dense, moist.	
2.0	1103.0						
	1102.0						
3.0						**SILTY GRAVELLY SAND** (3 to 5) Silty gravelly SAND; trace cobbles; non-plastic, sub rounded to rounded, well graded, medium brown, very dense, moist. [Glacial Till]	
	1101.0						
4.0							
	1100.0	G B	TP14-115-1				
5.0						End of Test Pit: 5 m Limit of excavator	
	1099.0						

GENERAL REMARKS:
Easy to excavate up until 3 m depth. Pit walls stable and open.

SAMPLING SYMBOLS:
G B GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-115

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-116
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 12 Aug 14

Location: TSF Basin
Total Depth: 4 m
Date Completed: 12 Aug 14

Coordinates: 682,868 E , 5,606,253 N UTM NAD83 ZONE10
Elevation: 1045.6 m
Logged by: JAS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1045.6					**TOPSOIL/ORGANICS** (0 to 0.1) ORGANICS; root mat; and TOPSOIL; SILT; some sand; trace gravel, fine grained, poorly graded, non plastic, medium brown, loose, dry.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.2 m 0.2 m - C: 0.2 - 0.7 m
	1045.0					**SILT** (0.1 to 0.2) SILT; some gravel, fine to coarse grained, poorly graded, non plastic, medium brown, loose, dry. [Loess]	
1.0						**SILTY GRAVEL** (0.2 to 4) Silty GRAVEL; some sand; some cobbles; non-plastic, well graded, medium brown, dry. [Glacial Till]	
	1044.0						
2.0							
	1043.0						
3.0							
	1042.0						
4.0						End of Test Pit: 4 m Limit of excavator	
	1041.0						
5.0							
	1040.0						

GENERAL REMARKS:
Difficult to excavate (high gravel content). Pit walls stable and open.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-116

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-117
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 13 Aug 14

Location: TSF Basin
Total Depth: 5 m
Date Completed: 13 Aug 14

Coordinates: 682,895 E , 5,606,130 N UTM NAD83 ZONE10
Elevation: 1034.7 m
Logged by: JAS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1034.0					**TOPSOIL/ORGANICS** (0 to 0.05) ORGANICS; root mat; and TOPSOIL; SILT; some sand; trace gravel, fine grained, poorly graded, non plastic, medium brown, loose, dry.	0 m - A: 0 - 0.05 m 0.05 m - B: 0.05 - 0.15 m 0.15 m - C: 0.15 - 0.7 m
						SILT (0.05 to 0.15) SILT; some sand; trace gravel, fine grained, poorly graded, non plastic, medium brown, loose, dry. [Loess]	
1.0	1033.0					**SILT** (0.15 to 5) SILT; some sand; some gravel; some cobbles; non-plastic, sub rounded to rounded, well graded, medium brown, dense, moist. [Glacial Till]	
2.0	1032.0						
3.0	1031.0						
4.0	1030.0						
5.0	1029.0					End of Test Pit: 5 m Limit of excavator	

GENERAL REMARKS:
Easy to excavate up until 2 m depth. Pit walls stable and open.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-117

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-118
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 13 Aug 14

Location: TSF Basin
Total Depth: 1.3 m
Date Completed: 13 Aug 14

Coordinates: 682,714 E , 5,606,364 N UTM NAD83 ZONE10
Elevation: 1024.3 m
Logged by: JAS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1024.0					**TOPSOIL/ORGANICS** (0 to 0.1) ORGANICS; root mat; and TOPSOIL; SILT; some gravel; poorly graded, non plastic, dark brown, massive, loose, dry.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.3 m
						SILT (0.1 to 0.9) SILT; some gravel; poorly graded, non plastic, dark brown, massive, loose, dry. [Loess]	
1.0	1023.0					**CLAY** (0.9 to 1.2) CLAY; some gravel; non-plastic, poorly graded, light yellow, dense, dry. Possibly highly weathered bedrock. [Colluvium]	
						WEATHERED BEDROCK (1.2 to 1.3) Light grey-green, massive, slightly weathered, strong, meta-volcanic.	
2.0	1022.0					End of Test Pit: 1.3 m Refusal on weathered bedrock	
3.0	1021.0						
4.0	1020.0						
5.0	1019.0						

GENERAL REMARKS:
Pit walls stable and open. No groundwater.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-118

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-119
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 13 Aug 14

Location: South Embankment
Total Depth: 3 m
Date Completed: 13 Aug 14

Coordinates: 682,778 E , 5,605,896 N UTM NAD83 ZONE10
Elevation: 1032.1 m
Logged by: JAS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1032.0					**TOPSOIL/ORGANICS** (0 to 0.1) ORGANICS; root mat; and TOPSOIL; SILT; fine grained, uniformly graded, low plasticity, dark brown, moist.. **SILT** (0.1 to 0.9) SILT; fine grained, uniformly graded, low plasticity, dark brown, moist. [Loess]	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.9 m
1.0	1031.0					**CLAYEY SILT** (0.9 to 3) Clayey; SILT; trace boulders; medium plasticity, angular boulders, uniformly graded, mottled light yellow and orange, soft, wet. [Colluvium]	
2.0	1030.0						
3.0	1029.0				▼	End of Test Pit: 3 m Groundwater Seepage	2.9 m - Groundwater Seepage at 2.9 m
4.0	1028.0						
5.0	1027.0						

GENERAL REMARKS:
Pit walls stable and open. Water seeping in at base of pit. Pit is next to bedrock outcrop in small valley, possibly an old stream bed.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-119

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-120
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 13 Aug 14

Location: Downstream of South Embankment
Total Depth: 5 m
Date Completed: 13 Aug 14

Coordinates: 682,779 E , 5,605,820 N UTM NAD83 ZONE10
Elevation: 1032.6 m
Logged by: JAS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1032.6					**TOPSOIL/ORGANICS** (0 to 0.1) ORGANICS; root mat; and TOPSOIL; Sandy SILT; some gravel, fine to coarse grained, sub rounded; uniformly graded, low plasticity, dark brown, massive, loose, moist.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.4 m
	1032.0					**SILT** (0.1 to 0.4) SILT; some gravel, fine to coarse grained, sub rounded; uniformly graded, low plasticity, dark brown, massive, loose, moist. [Loess]	
1.0						**SILTY SANDY GRAVEL** (0.4 to 0.6) Silty sandy GRAVEL; non-plastic, well graded, medium brown, loose, dry.	
	1031.0					**SILT** (0.6 to 2) SILT; medium plasticity; uniformly graded; massive, soft, moist. [Lacustrine]	
2.0						**SAND AND GRAVEL** (2 to 3.7) Sandy GRAVEL; some silt; non-plastic, angular, white-brown, loose, moist.	
	1030.0						
3.0							
	1029.0						
4.0						**SAND AND SILT** (3.7 to 5) Sandy SILT; non-plastic, poorly graded, soft, wet. [Lacustrine]	
	1028.0				▼		4.7 m - Groundwater Seepage at 4.7 m
5.0						End of Test Pit: 5 m Limit of excavator	
	1027.0						

GENERAL REMARKS:
Water seeping in from 4.7 m onwards causing test pit walls to collapse. Water ponding to a depth of 0.25 m.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-120

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Contractor: Cobra Contracting Ltd.
Location: TSF Basin
Coordinates: 682,645 E , 5,606,187 N UTM NAD83 ZONE10

Test Pit No.: TP14-121
Equipment Used: CAT 320D L
Total Depth: 3.2 m
Elevation: 1027.4 m

Page: 1 of 1
Date Started: 13 Aug 14
Date Completed: 13 Aug 14
Logged by: JAS
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1027.4					**TOPSOIL/ORGANICS** (0 to 0.05) ORGANICS; root mat; and TOPSOIL; SILT; some gravel, fine to coarse grained, sub angular to rounded; poorly graded, non plastic, medium brown, massive, loose, dry.	0 m - A: 0 - 0.05 m 0.05 m - B: 0.05 - 0.15 m 0.15 m - C: 0.15 - 1 m
1.0	1026.0					**SILT** (0.05 to 3.1) SILT; some gravel, sub rounded; poorly graded, non plastic, light brown, moist. [Loess]	
3.0	1024.0					**WEATHERED BEDROCK** (3.1 to 3.2) Light grey, fine grained, slightly weathered, meta-sediment. End of Test Pit: 3.2 m Refusal on weathered bedrock	
5.0	1022.0						

GENERAL REMARKS:
Pit walls stable and open. No groundwater.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-121

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-122
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 13 Aug 14

Location: South Embankment
Total Depth: 3.7 m
Date Completed: 13 Aug 14

Coordinates: 683,045 E , 5,605,932 N UTM NAD83 ZONE10
Elevation: 1034.2 m
Logged by: JAS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1034.0					**SILTY GRAVEL** (0 to 3.7) Silty GRAVEL; some sand; some cobbles; non-plastic, well graded, medium brown, loose, dry. [Road Fill]	0 m - Disturbed Material at Surface
1.0	1033.0						
2.0	1032.0						
3.0	1031.0						
3.7						**WEATHERED BEDROCK** (3.7 to 3.7) Light grey, fine grained, slightly weathered, meta-sediment. End of Test Pit: 3.7 m Refusal on weathered bedrock	
4.0	1030.0						
5.0	1029.0						

GENERAL REMARKS:
Pit walls stable and open. No groundwater. Located on old road.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-122

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-123
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 14 Aug 14

Location: South Embankment
Total Depth: 5 m
Date Completed: 14 Aug 14

Coordinates: 683,090 E , 5,606,099 N UTM NAD83 ZONE10
Elevation: 1037.6 m
Logged by: JAS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1037.6					**TOPSOIL/ORGANICS** (0 to 0.1) ORGANICS; root mat; and TOPSOIL; SILT; some fine gravel; non-plastic, sub rounded, poorly graded, medium brown, firm, dry.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.15 m 0.15 m - C: 0.15 - 0.9 m
	1037.0					**SILT** (0.1 to 0.15) SILT; some fine gravel; non-plastic, sub rounded, poorly graded, medium brown, firm, dry. [Loess]	
1.0						**SILTY GRAVEL** (0.15 to 5) Silty GRAVEL; fine to coarse grained, non-plastic, sub rounded to rounded, poorly graded, medium brown, moderately dense, dry. [Glacial Till]	
	1036.0						
2.0							
	1035.0						
3.0							
	1034.0						
4.0		G B	TP14-123-1				
	1033.0						
5.0						End of Test Pit: 5 m Limit of excavator	
	1032.0						

GENERAL REMARKS:
Pit walls stable and open. No groundwater.

SAMPLING SYMBOLS:
G B GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-123

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-124
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 14 Aug 14

Location: South Embankment
Total Depth: 4.84 m
Date Completed: 14 Aug 14

Coordinates: 683,205 E , 5,605,908 N UTM NAD83 ZONE10
Elevation: 1029.3 m
Logged by: JAS/JEF

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1029.0					**TOPSOIL/ORGANICS** (0 to 0.12) ORGANICS; root mat; and TOPSOIL; SILT and GRAVEL; fine to coarse grained; non-plastic, poorly graded, medium brown, dry.	0 m - A: 0 - 0.12 m 0.12 m - B: 0.12 - 0.62 m
						SILT AND GRAVEL (0.12 to 0.62) SILT and GRAVEL; fine to coarse grained; non-plastic, poorly graded, medium brown, dry.	
1.0	1028.0					**SILTY GRAVEL** (0.62 to 4.84) Silty GRAVEL; some cobbles; some boulders; fine to coarse grained, non-plastic, sub angular to sub rounded, poorly graded, medium brown, dry. [Glacial Till]	
2.0	1027.0						
3.0	1026.0						
4.0	1025.0						
5.0	1024.0					End of Test Pit: 4.84 m Limit of excavator	

GENERAL REMARKS:
Pit walls stable and open. No groundwater.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-124

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-125
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 14 Aug 14

Location: Downstream of South Embankment
Total Depth: 5 m
Date Completed: 14 Aug 14

Coordinates: 683,349 E , 5,605,796 N UTM NAD83 ZONE10
Elevation: 1027.9 m
Logged by: JAS/JEF

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1027.9					**TOPSOIL/ORGANICS** (0 to 0.03) ORGANICS; root mat; and TOPSOIL; SILT; some gravel; trace clay; fine to coarse grained; low plasticity, sub angular to sub rounded, poorly graded, dark brown, dry.	0 m - A: 0 - 0.03 m 0.03 m - B: 0.03 - 0.29 m
						SILT AND GRAVEL (0.03 to 0.29) SILT and GRAVEL; fine to coarse grained; low plasticity, sub angular to sub rounded, poorly graded, light brown, dry.	
1.0	1027.0					**SILTY GRAVEL** (0.29 to 2) Silty GRAVEL; some sand; some cobbles; some boulders; fine to coarse grained, non-plastic, sub angular to sub rounded, well graded, light brown, dry. [Glacial Till]	
2.0	1026.0					**SILT** (2 to 5) SILT; trace gravel; fine grained, low plasticity, sub angular to sub rounded, uniformly graded, light brown, layered, dry to moist. [Lacustrine Silt]	
3.0	1025.0						
4.0	1024.0						
5.0	1023.0					End of Test Pit: 5 m Limit of excavator	
	1022.0						

GENERAL REMARKS:
Pit walls stable and open. No groundwater.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-125

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-126
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 14 Aug 14

Location: Downstream of South Embankment
Total Depth: 3.36 m
Date Completed: 14 Aug 14

Coordinates: 683,515 E , 5,605,720 N UTM NAD83 ZONE10
Elevation: 1038.5 m
Logged by: JAS/JEF

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1038.0	GB	TP14-126-1			**TOPSOIL/ORGANICS** (0 to 0.08) ORGANICS; root mat; and TOPSOIL; SILT; some gravel; fine to coarse grained; low plasticity, sub rounded, poorly graded, dark brown, loose, dry.	0 m - A: 0 - 0.08 m 0.08 m - B: 0.08 - 0.27 m
						SILT (0.08 to 0.27) SILT; some gravel; fine to coarse grained; low plasticity, sub rounded, poorly graded, dark brown, loose, dry. [Lacustrine Silt]	
1.0	1037.0					**SILT** (0.27 to 3.36) SILT; some gravel; fine to medium grained; non-plastic, sub rounded, poorly graded, medium brown, moist to dry. [Lacustrine Silt]	
2.0	1036.0						
3.0	1035.0					End of Test Pit: 3.36 m Refusal on boulder	
4.0	1034.0						
5.0	1033.0						

GENERAL REMARKS:
Pit walls stable and open. No groundwater.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-126

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-127
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 14 Aug 14

Location: Downstream of South Embankment
Total Depth: 4.75 m
Date Completed: 14 Aug 14

Coordinates: 683,711 E , 5,605,668 N UTM NAD83 ZONE10
Elevation: 1069.7 m
Logged by: JAS/JEF

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1069.0					**TOPSOIL/ORGANICS** (0 to 0.05) ORGANICS; root mat; and TOPSOIL; SILT; some gravel; fine to coarse grained; low plasticity, sub angular to sub rounded, poorly graded, dark brown, loose, dry.	0 m - A: 0 - 0.05 m 0.05 m - B: 0.05 - 0.27 m 0.27 m - C: 0.27 - 1.16 m
						SILT (0.05 to 0.27) SILT; some gravel; fine to coarse grained; low plasticity, sub angular to sub rounded, poorly graded, medium greyish-brown, loose, dry. [Lacustrine]	
1.0						**SILT** (0.27 to 0.98) SILT; some gravel; some cobbles; trace boulders; fine to coarse grained; non-plastic, sub angular to sub rounded, poorly graded, light to medium brown, moist to dry. [Lacustrine]	
	1068.0					**SILT** (0.98 to 1.16) SILT; some gravel; some cobbles; trace boulders; fine to coarse grained; non-plastic, sub angular to sub rounded, poorly graded, white, moist to dry. [Lacustrine]	
2.0						**SILT AND GRAVEL** (1.16 to 1.96) SILT and GRAVEL; fine to coarse grained, non-plastic, sub angular to sub rounded, gap graded, light brown, dry. [Glaciofluvial]	
						SILT (1.96 to 4.75) SILT; trace gravel; fine grained, low plasticity, sub angular to sub rounded, poorly graded, medium brown, dry to moist. [Lacustrine]	
	1067.0						
3.0							
	1066.0						
4.0							
	1065.0					End of Test Pit: 4.75 m Limit of excavator	
5.0							
	1064.0						

GENERAL REMARKS:
Pit walls stable and open. No groundwater.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-127

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-128
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 15 Aug 14

Location: Downstream of South Embankment
Total Depth: 2.69 m
Date Completed: 15 Aug 14

Coordinates: 683,865 E , 5,605,543 N UTM NAD83 ZONE10
Elevation: 1067.2 m
Logged by: JEF

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1067.0					**TOPSOIL/ORGANICS** (0 to 0.14) ORGANICS; root mat; and TOPSOIL; SILT; some gravel; fine to coarse grained; low plasticity, sub angular to sub rounded, poorly graded, dark brown, loose, dry.	0 m - A: 0 - 0.14 m 0.14 m - B: 0.14 - 0.42 m
						SILT (0.14 to 0.42) SILT; some gravel; fine to coarse grained; low plasticity, sub angular to sub rounded, poorly graded, medium brown, loose, dry. [Loess]	
1.0	1066.0					**SILT AND GRAVEL** (0.42 to 2.69) SILT and GRAVEL; trace cobbles; fine to coarse grained, non-plastic, sub angular to sub rounded, gap graded, light brown, stratified, dry. Decreasing gravel content with depth. [Glaciofluvial]	
2.0	1065.0						
3.0	1064.0					End of Test Pit: 2.69 m Wall Instability	
4.0	1063.0						
5.0	1062.0						

GENERAL REMARKS:
Pit walls caving in from beneath topsoil unit. No groundwater.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-128

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-129
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 15 Aug 14

Location: Downstream of South Embankment
Total Depth: 3.68 m
Date Completed: 15 Aug 14

Coordinates: 684,067 E , 5,605,471 N UTM NAD83 ZONE10
Elevation: 1087.7 m
Logged by: JEF

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1087.0					**TOPSOIL/ORGANICS** (0 to 0.13) ORGANICS; root mat; and TOPSOIL; SILT; some gravel; fine to coarse grained; non-plastic, sub angular to sub rounded, poorly graded, dark brown, dry.	0 m - A: 0 - 0.13 m 0.13 m - B: 0.13 - 0.31 m 0.31 m - C: 0.31 - 0.76 m
						SILT (0.13 to 0.31) SILT; some gravel; fine to coarse grained; non-plastic, sub angular to sub rounded, poorly graded, medium brown, dry.	
1.0						**SILT** (0.31 to 0.63) SILT; some gravel; fine to coarse grained; non-plastic, sub angular to sub rounded, poorly graded, light brown, dry. [Loess]	
	1086.0					**SILT** (0.63 to 0.76) SILT; some gravel; fine to coarse grained; non-plastic, sub angular to sub rounded, poorly graded, white, dry. [Loess]	
2.0						**GRAVELLY SILT** (0.76 to 3.68) Gravelly; SILT; trace cobbles; fine to coarse grained, non-plastic, sub angular to sub rounded, gap graded, light brown, massive, dry. [Glacial Till]	
	1085.0						
3.0							
	1084.0					**WEATHERED BEDROCK** (3.68) Light grey-green, massive, slightly weathered, strong, meta-volcanic. End of Test Pit: 3.68 m Refusal on weathered bedrock	
4.0							
	1083.0						
5.0							
	1082.0						

GENERAL REMARKS:
Pit walls stable and open. No groundwater.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-129

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-130
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 15 Aug 14

Location: TSF Basin
Total Depth: 0.69 m
Date Completed: 15 Aug 14

Coordinates: 684,133 E , 5,605,624 N UTM NAD83 ZONE10
Elevation: 1066 m
Logged by: JEF

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
						TOPSOIL/ORGANICS (0 to 0.19) ORGANICS; root mat; and TOPSOIL; SILT; some gravel; fine to coarse grained; low plasticity, sub angular to sub rounded, poorly graded, dark brown, dry.	0 m - A: 0 - 0.19 m 0.19 m - B: 0.19 - 0.69 m
						GRAVELLY SILT (0.19 to 0.69) Gravelly; SILT; fine to coarse grained, non-plastic, sub angular to sub rounded, gap graded, medium brown, dry. [Colluvium]	
1.0	1065.0					**WEATHERED BEDROCK** (0.69) Light grey-green, massive, slightly weathered, strong, meta-volcanic. End of Test Pit: 0.69 m Refusal on weathered bedrock	
2.0	1064.0						
3.0	1063.0						
4.0	1062.0						
5.0	1061.0						

GENERAL REMARKS:
Pit walls stable and open. No groundwater.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-130

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-131
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 15 Aug 14

Location: South Embankment
Total Depth: 3.85 m
Date Completed: 15 Aug 14

Coordinates: 683,786 E , 5,605,829 N UTM NAD83 ZONE10
Elevation: 1057.3 m
Logged by: JEF

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1057.0					**TOPSOIL/ORGANICS** (0 to 0.39) ORGANICS; root mat; and TOPSOIL; SILT; some gravel; fine to coarse grained; low plasticity, sub angular to sub rounded, poorly graded, dark brown, moist.	0 m - A: 0 - 0.39 m
						SILT (0.39 to 0.74) SILT; some gravel; fine to coarse grained; low plasticity, sub angular to sub rounded, poorly graded, medium brown, dry to moist. [Loess]	0.39 m - B: 0.39 - 0.74 m
1.0	1056.0					**GRAVELLY SILT** (0.74 to 0.98) Gravelly; SILT; fine to coarse grained, non-plastic, sub angular to sub rounded, gap graded, light brown, dry.	0.74 m - C: 0.74 - 1.22 m
						GRAVELLY SILT (0.98 to 1.22) Gravelly; SILT; fine to coarse grained, non-plastic, sub angular to sub rounded, gap graded, white, dry.	
2.0	1055.0					**SILT** (1.22 to 3.85) SILT; some gravel; trace cobbles; trace boulders; fine to coarse grained; non-plastic, sub angular to sub rounded, poorly graded, light brown, dry to moist. [Loess]	
3.0	1054.0						
4.0	1053.0					**WEATHERED BEDROCK** (3.85) Light grey-green, massive, slightly weathered, strong, meta-volcanic. End of Test Pit: 3.85 m Refusal on weathered bedrock	
5.0	1052.0						

GENERAL REMARKS:
Pit walls stable and open. No groundwater.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-131

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-132
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 15 Aug 14

Location: TSF Basin
Total Depth: 0.51 m
Date Completed: 15 Aug 14

Coordinates: 683,920 E , 5,605,730 N UTM NAD83 ZONE10
Elevation: 1056.2 m
Logged by: JEF

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1056.0					**TOPSOIL/ORGANICS** (0 to 0.05) ORGANICS; root mat; and TOPSOIL; SILT; some gravel; fine to coarse grained; low plasticity, sub angular to sub rounded, poorly graded, dark brown, dry to moist.	0 m - A: 0 - 0.05 m 0.05 m - B: 0.05 - 0.31 m
						SILT (0.05 to 0.31) SILT; some gravel; fine to coarse grained; low plasticity, sub angular to sub rounded, poorly graded, medium brown, dry to moist. [Loess]	
1.0	1055.0					**GRAVELLY SILT** (0.31 to 0.51) Gravelly; SILT; fine to coarse grained, non-plastic, sub angular to sub rounded, gap graded, light brown, dry. [Colluvium]	
						WEATHERED BEDROCK (0.51) Light grey-green, massive, slightly weathered, strong, meta-volcanic. End of Test Pit: 0.51 m Refusal on weathered bedrock	
2.0	1054.0						
3.0	1053.0						
4.0	1052.0						
5.0	1051.0						

GENERAL REMARKS:
Pit walls stable and open. No groundwater.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-132

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-133
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 15 Aug 14

Location: TSF Basin
Total Depth: 0.56 m
Date Completed: 15 Aug 14

Coordinates: 683,862 E , 5,605,992 N UTM NAD83 ZONE10
Elevation: 1032.3 m
Logged by: JEF

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1032.0					**TOPSOIL/ORGANICS** (0 to 0.1) ORGANICS; root mat; and TOPSOIL; gravelly; SILT; fine to coarse grained; low plasticity, sub angular to sub rounded, poorly graded, dark brown, dry.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.35 m
						SILT AND GRAVEL (0.1 to 0.38) SILT and GRAVEL; trace cobbles; fine to coarse grained, non-plastic, angular to sub rounded, gap graded, medium brown, dry. [Loess]	
1.0	1031.0					**GRAVELLY SILT** (0.38 to 0.56) Silty; COBBLES; some gravel; fine to coarse grained, non-plastic, angular to sub rounded, poorly graded, light brown, dense, dry. [Colluvium]	
						WEATHERED BEDROCK (0.56 to 0.6) Light grey-green, massive, slightly weathered, strong, meta-volcanic.	
2.0	1030.0					End of Test Pit: 0.56 m Refusal on weathered bedrock	
3.0	1029.0						
4.0	1028.0						
5.0	1027.0						

GENERAL REMARKS:
Pit walls stable and open. No groundwater.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-133

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-134
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 16 Aug 14

Location: TSF Basin
Total Depth: 3.82 m
Date Completed: 16 Aug 14

Coordinates: 684,218 E , 5,605,839 N UTM NAD83 ZONE10
Elevation: 1021 m
Logged by: JEF

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
						TOPSOIL/ORGANICS (0 to 0.17) ORGANICS; root mat; and TOPSOIL; SILT; some gravel; fine to coarse grained; low plasticity, sub angular to sub rounded, poorly graded, dark brown, dry to moist.	0 m - A: 0 - 0.17 m 0.17 m - B: 0.17 - 0.82 m
						SILT (0.17 to 0.82) SILT; some gravel; fine to coarse grained; low plasticity, sub angular to sub rounded, poorly graded, medium brown, dry to moist. [Loess]	
1.0	1020.0	G B	TP14-134-1			**GRAVELLY SILT** (0.82 to 3.82) Gravelly; SILT; trace cobbles; fine to coarse grained, non-plastic, sub angular to sub rounded, gap graded, light brown, massive, dry. [Colluvium]	
2.0	1019.0						
3.0	1018.0						
4.0	1017.0					**WEATHERED BEDROCK** (3.82) Light grey-green, massive, slightly weathered, strong, meta-volcanic. End of Test Pit: 3.82 m Refusal on bedrock	
5.0	1016.0						

GENERAL REMARKS:
Pit walls stable and open. No groundwater.

SAMPLING SYMBOLS:
G B GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-134

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-135
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 16 Aug 14

Location: TSF Basin
Total Depth: 3.2 m
Date Completed: 16 Aug 14

Coordinates: 684,054 E , 5,605,912 N UTM NAD83 ZONE10
Elevation: 1020.4 m
Logged by: JEF

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1020.0					**TOPSOIL/ORGANICS** (0 to 0.14) ORGANICS; root mat; and TOPSOIL; SILT; trace gravel; fine grained; sub angular to sub rounded, low plasticity, poorly graded, dark brown, dry to moist.	0 m - A: 0 - 0.14 m 0.14 m - B: 0.14 - 0.62 m
		G B	TP14-135-1			**SILT** (0.14 to 0.62) SILT; trace gravel; fine grained; sub angular to sub rounded, low plasticity, poorly graded, medium brown, dry to moist.	
1.0	1019.0					**GRAVELLY SILT** (0.62 to 3.2) gravelly SILT; trace cobbles; fine to coarse grained; sub angular to sub rounded, non-plastic, poorly graded, light brown, dry. [Glacial Till]	
2.0	1018.0						
3.0	1017.0					**WEATHERED BEDROCK** (3.2 to 3.3) Light grey-green, massive, slightly weathered, strong, meta-volcanic.	
						End of Test Pit: 3.2 m Refusal on weathered bedrock	
4.0	1016.0						
5.0	1015.0						

GENERAL REMARKS:
Pit walls stable and open. No groundwater.

SAMPLING SYMBOLS:
G B GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-135

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-136
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 16 Aug 14

Location: TSF Basin
Total Depth: 4.19 m
Date Completed: 16 Aug 14

Coordinates: 684,130 E , 5,606,048 N UTM NAD83 ZONE10
Elevation: 1015.3 m
Logged by: JEF

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1015.0					**TOPSOIL/ORGANICS** (0 to 0.08) ORGANICS; root mat; and TOPSOIL; SILT; trace gravel; fine grained; sub angular to sub rounded, low plasticity, poorly graded, dark brown, dry to moist.	0 m - A: 0 - 0.08 m 0.08 m - B: 0.08 - 0.52 m
						SILT (0.08 to 0.52) SILT; some gravel; fine to coarse grained; sub angular to sub rounded, low plasticity, poorly graded, medium brown, dry to moist. [Loess]	
1.0	1014.0					**GRAVELLY SILT** (0.52 to 4.19) Gravelly; SILT; trace cobbles; fine to coarse grained, non-plastic, angular to sub rounded, gap graded, light brown, dry. [Glacial Till]	
2.0	1013.0						
3.0	1012.0						
4.0	1011.0					End of Test Pit: 4.19 m Refusal on dense cobbles/boulders	
5.0	1010.0						

GENERAL REMARKS:
Pit walls stable and open. No groundwater.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-136

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-137
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 16 Aug 14

Location: TSF Basin
Total Depth: 3.95 m
Date Completed: 16 Aug 14

Coordinates: 684,094 E , 5,606,239 N UTM NAD83 ZONE10
Elevation: 1026.4 m
Logged by: JEF

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1026.0	G B	TP14-137-1			**TOPSOIL/ORGANICS** (0 to 0.07) ORGANICS; root mat; and TOPSOIL; SILT; trace clay; trace gravel; fine grained; sub angular to sub rounded, low plasticity, poorly graded, dark brown, dry.	0 m - A: 0 - 0.07 m 0.07 m - B: 0.07 - 0.32 m
						SILT (0.07 to 0.32) SILT; some gravel; fine to coarse grained; sub angular to sub rounded, low plasticity, poorly graded, medium brown, dry.	
1.0	1025.0					**GRAVELLY SILT** (0.32 to 3.95) Gravelly; SILT; trace cobbles; fine to coarse grained, non-plastic, angular to sub rounded, gap graded, light brown, dry. [Glacial Till]	
2.0	1024.0						
3.0	1023.0						
4.0	1022.0					End of Test Pit: 3.95 m Refusal on possible bedrock	
5.0	1021.0						

GENERAL REMARKS:
Pit walls stable and open. No groundwater.

SAMPLING SYMBOLS:
G B GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-137

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-138
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 16 Aug 14

Location: TSF Basin
Total Depth: 1.29 m
Date Completed: 16 Aug 14

Coordinates: 683,998 E , 5,606,462 N UTM NAD83 ZONE10
Elevation: 1023.2 m
Logged by: JEF

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1023.0					**TOPSOIL/ORGANICS** (0 to 0.1) ORGANICS; root mat; and TOPSOIL; SILT; some gravel; fine to coarse grained; low plasticity, sub angular to sub rounded, poorly graded, dark brown, dry.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.42 m
						SILT (0.1 to 0.42) SILT; some gravel; fine to coarse grained; low plasticity, sub angular to sub rounded, poorly graded, medium brown, dry. [Loess]	
1.0	1022.0					**GRAVELLY SILT** (0.42 to 1.29) Gravelly; SILT; trace cobbles; fine to coarse grained, non-plastic, angular to sub rounded, gap graded, light brown, dense, dry. [Colluvium]	
						WEATHERED BEDROCK (1.29 to 1.4) Light grey-green, massive, slightly weathered, strong, meta-volcanic.	
2.0	1021.0					End of Test Pit: 1.29 m Refusal on weathered bedrock	
3.0	1020.0						
4.0	1019.0						
5.0	1018.0						

GENERAL REMARKS:

Pit walls stable and open. No groundwater. Lots of outcrop surrounding test pit location.

SAMPLING SYMBOLS:

GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-138

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-139
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 16 Aug 14

Location: TSF Basin
Total Depth: 4.2 m
Date Completed: 16 Aug 14

Coordinates: 683,958 E , 5,606,172 N UTM NAD83 ZONE10
Elevation: 1017.5 m
Logged by: JEF

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1017.0					**TOPSOIL/ORGANICS** (0 to 0.16) ORGANICS; root mat; and TOPSOIL; SILT; trace clay; trace gravel; fine grained; sub angular to sub rounded, low plasticity, poorly graded, dark brown, dry.	0 m - A: 0 - 0.16 m 0.16 m - B: 0.16 - 0.41 m
						SILT (0.16 to 0.41) SILT; some gravel; fine to coarse grained, low plasticity, poorly graded, medium brown, dry. [Loess]	
1.0	1016.0					**GRAVELLY SILT** (0.41 to 4.2) Gravelly SILT; some sand; some cobbles; fine to coarse grained, non-plastic, sub angular to rounded, well graded, medium brown, very dense, dry. [Glacial Till]	
2.0	1015.0						
3.0	1014.0						
4.0	1013.0					End of Test Pit: 4.2 m Refusal on dense material	
5.0	1012.0						

GENERAL REMARKS:
Difficult to excavate. Pit walls stable and open. No groundwater. Some outcrop surrounding test pit location.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-139

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-140
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 16 Aug 14

Location: TSF Basin
Total Depth: 3.35 m
Date Completed: 16 Aug 14

Coordinates: 683,916 E , 5,606,368 N UTM NAD83 ZONE10
Elevation: 1012.4 m
Logged by: JEF

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1012.0					**TOPSOIL/ORGANICS** (0 to 0.08) ORGANICS; root mat; and TOPSOIL; SILT; trace gravel; fine grained; sub angular to sub rounded, low plasticity, poorly graded, dark brown, dry to moist.	0 m - A: 0 - 0.08 m 0.08 m - B: 0.08 - 0.8 m
						SILT (0.08 to 0.5) SILT; trace gravel; fine grained; sub angular to sub rounded, low plasticity, poorly graded, medium brown, dry to moist. [Loess]	
1.0	1011.0					**GRAVELLY SILT** (0.5 to 1.6) Silty GRAVEL; trace cobbles; fine to coarse grained, non-plastic, sub angular to rounded, poorly graded, medium brown, dry.	
2.0	1010.0					**SILT** (1.6 to 3.35) SILT; trace gravel; trace cobbles; fine grained; sub angular to sub rounded, non-plastic, poorly graded, medium brown, loose to moderately dense, dry to moist. [Loess]	
3.0		G B	TP14-140-1				
	1009.0					End of Test Pit: 3.35 m Wall Instability	
4.0	1008.0						
5.0	1007.0						

GENERAL REMARKS:
Pit walls collapsing from 0.5 m onwards. No groundwater.

SAMPLING SYMBOLS:
G B GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-140

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-141
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 18 Aug 14

Location: TSF Basin
Total Depth: 4.46 m
Date Completed: 18 Aug 14

Coordinates: 683,893 E , 5,606,600 N UTM NAD83 ZONE10
Elevation: 994.7 m
Logged by: JEF

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	994.0					**TOPSOIL/ORGANICS** (0 to 0.08) ORGANICS; root mat; and TOPSOIL; SILT; trace gravel; fine grained; sub angular to sub rounded, low plasticity, poorly graded, dark brown, dry to moist.	0 m - A: 0 - 0.08 m 0.08 m - B: 0.08 - 0.7 m
						SILT (0.08 to 0.7) SILT; trace gravel; fine grained; sub angular to sub rounded, low plasticity, poorly graded, medium brown, dry to moist. [Loess]	0.7 m - C: 0.7 - 0.96 m
1.0						**SILT** (0.7 to 0.96) SILT; some gravel; trace cobbles; fine to coarse grained; non-plastic, sub angular to rounded, poorly graded, medium brown, dry. [Loess]	
	993.0	G B	TP14-141-1			**SILT** (0.96 to 4.46) SILT; some gravel; trace cobbles; fine to coarse grained; non-plastic, sub angular to rounded, poorly graded, white, dry. [Loess]	
2.0							
	992.0						
3.0							
	991.0						
4.0							
	990.0					End of Test Pit: 4.46 m Limit of excavator	
5.0							
	989.0						

GENERAL REMARKS:
Pit walls stable and open. No groundwater.

SAMPLING SYMBOLS:
G B GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-141

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-142
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 18 Aug 14

Location: TSF Basin
Total Depth: 4.95 m
Date Completed: 18 Aug 14

Coordinates: 683,731 E , 5,606,499 N UTM NAD83 ZONE10
Elevation: 1000.4 m
Logged by: JEF

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1000.0					**TOPSOIL/ORGANICS** (0 to 0.1) ORGANICS; root mat; and TOPSOIL; SILT; trace gravel; fine grained; sub angular to sub rounded, low plasticity, poorly graded, dark brown, dry.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.31 m
						SILT (0.1 to 0.31) SILT; trace gravel; fine grained; sub angular to sub rounded, low plasticity, poorly graded, medium brown, dry. [Loess]	
1.0	999.0					**GRAVELLY SILT** (0.31 to 4.95) Gravelly; SILT; trace sand; trace cobbles; fine to coarse grained, non-plastic, sub angular to rounded, well graded, medium brown, dry. [Glacial Till]	
2.0	998.0						
3.0	997.0						
4.0	996.0						
5.0	995.0					End of Test Pit: 4.95 m Limit of excavator	

GENERAL REMARKS:
Pit walls stable and open. No groundwater.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-142

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-143
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 18 Aug 14

Location: TSF Basin
Total Depth: 4.35 m
Date Completed: 18 Aug 14

Coordinates: 683,639 E , 5,606,402 N UTM NAD83 ZONE10
Elevation: 1005.9 m
Logged by: JEF

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1005.9					**TOPSOIL/ORGANICS** (0 to 0.04) ORGANICS; root mat; and TOPSOIL; SILT; some gravel; fine to coarse grained; low plasticity, sub angular to sub rounded, poorly graded, dark brown, dry.	0 m - A: 0 - 0.09 m 0.09 m - B: 0.09 - 0.33 m
						SILT (0.04 to 0.33) SILT; some gravel; trace cobbles; fine to coarse grained; low plasticity, sub angular to rounded, poorly graded, medium brown, dry. [Loess]	
1.0	1005.0					**GRAVELLY SILT** (0.33 to 4.35) Gravelly; SILT; some cobbles; fine to coarse grained, non-plastic, sub angular to sub rounded, gap graded, light brown, dry. [Glacial Till]	
2.0	1004.0						
3.0	1003.0						
4.0	1002.0						
4.35	1001.6					End of Test Pit: 4.35 m Refusal on dense material.	
5.0	1001.0						
	1000.0						

GENERAL REMARKS:
Pit walls stable and open. No groundwater.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-143

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-144
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 18 Aug 14

Location: TSF Basin
Total Depth: 5.1 m
Date Completed: 18 Aug 14

Coordinates: 683,704 E , 5,606,226 N UTM NAD83 ZONE10
Elevation: 1025.7 m
Logged by: JEF

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1025.7					**TOPSOIL/ORGANICS** (0 to 0.1) ORGANICS; root mat; and TOPSOIL; SILT; trace gravel; fine grained; sub angular to sub rounded, low plasticity, poorly graded, dark brown, dry.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.4 m
						SILT (0.1 to 0.4) SILT; trace gravel; fine grained; sub angular to sub rounded, low plasticity, poorly graded, medium brown, dry. [Loess]	
1.0	1025.0					**GRAVELLY SILT** (0.4 to 5.1) Gravelly; SILT; trace cobbles; fine to coarse grained, non-plastic, sub angular to sub rounded, gap graded, light brown, dry. [Glacial Till]	
2.0	1024.0						
3.0	1023.0						
4.0	1022.0						
5.0	1021.0					End of Test Pit: 5.1 m Limit of excavator	
	1020.0						

GENERAL REMARKS:
Pit walls stable and open. No groundwater.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-144

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-145
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 18 Aug 14

Location: TSF Basin
Total Depth: 4.9 m
Date Completed: 18 Aug 14

Coordinates: 683,538 E , 5,606,135 N UTM NAD83 ZONE10
Elevation: 1035.3 m
Logged by: JEF

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1035.0					**TOPSOIL/ORGANICS** (0 to 0.13) ORGANICS; root mat; and TOPSOIL; SILT; trace gravel; trace cobbles; fine grained; sub angular to rounded, low plasticity, poorly graded, dark brown, dry.	0 m - A: 0 - 0.13 m 0.13 m - B: 0.13 - 0.2 m
						SILT (0.13 to 0.2) SILT; trace gravel; trace cobbles; fine grained; sub angular to rounded, low plasticity, poorly graded, medium brown, dry. [Loess]	
1.0	1034.0					**SILT AND GRAVEL** (0.2 to 4.9) SILT; some gravel; trace cobbles; fine to coarse grained; non-plastic, sub angular to rounded, poorly graded, light brown, dry. [Glacial Till]	
2.0	1033.0						
3.0	1032.0						
4.0	1031.0						
5.0	1030.0					End of Test Pit: 4.9 m Limit of excavator	

GENERAL REMARKS:
Pit walls stable and open. No groundwater.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-145

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-146
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 19 Sep 14

Location: TSF Basin
Total Depth: 4.85 m
Date Completed: 19 Sep 14

Coordinates: 683,690 E , 5,606,080 N UTM NAD83 ZONE10
Elevation: 1037.2 m
Logged by: JEF

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1037.0					**TOPSOIL/ORGANICS** (0 to 0.15) ORGANICS; root mat; and TOPSOIL; SILT; some gravel; fine to coarse grained; low plasticity, sub angular to sub rounded, poorly graded, dark brown, dry.	0 m - A: 0 - 0.15 m 0.15 m - B: 0.15 - 0.3 m
						SILT (0.15 to 0.3) SILT; some gravel; trace cobbles; fine to coarse grained; low plasticity, sub angular to rounded, poorly graded, medium brown, dry. [Loess]	
1.0	1036.0					**GRAVELLY SILT** (0.3 to 4.85) Gravelly; SILT; trace cobbles; fine to coarse grained, non-plastic, sub angular to rounded, gap graded, light brown, dry. [Glacial Till]	
2.0	1035.0						
3.0	1034.0						
4.0	1033.0						
5.0	1032.0					End of Test Pit: 4.85 m Limit of excavator	

GENERAL REMARKS:
Pit walls stable and open. No groundwater.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-146

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-147
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 19 Sep 14

Location: South Embankment
Total Depth: 5 m
Date Completed: 19 Sep 14

Coordinates: 683,601 E , 5,605,945 N UTM NAD83 ZONE10
Elevation: 1028.9 m
Logged by: JEF

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1028.9					**TOPSOIL/ORGANICS** (0 to 0.07) ORGANICS; root mat; and TOPSOIL; SILT; some gravel; fine to coarse grained; low plasticity, sub angular to sub rounded, poorly graded, dark brown, dry.	0 m - A: 0 - 0.07 m 0.07 m - B: 0.07 - 0.3 m
						SILT (0.07 to 0.3) SILT; some gravel; fine to coarse grained; low plasticity, sub angular to sub rounded, poorly graded, medium brown, dry. [Loess]	
1.0	1028.0					**GRAVELLY SILT** (0.3 to 5) Gravelly; SILT; trace cobbles; fine to coarse grained, non-plastic, sub angular to rounded, gap graded, light brown, dry. Cobble content increasing with depth. Trace boulders near base of pit. [Glacial Till]	
2.0	1027.0						
3.0	1026.0						
4.0	1025.0						
5.0	1024.0					End of Test Pit: 5 m Limit of excavator	
	1023.0						

GENERAL REMARKS:
Pit walls stable and open. No groundwater.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-147

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-148
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 19 Sep 14

Location: TSF Basin
Total Depth: 4.68 m
Date Completed: 19 Sep 14

Coordinates: 683,410 E , 5,606,512 N UTM NAD83 ZONE10
Elevation: 1006.9 m
Logged by: JEF

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0						**TOPSOIL/ORGANICS** (0 to 0.35) ORGANICS; root mat; and TOPSOIL; SILT; some gravel; fine to coarse grained; low plasticity, sub angular to sub rounded, poorly graded, dark brown, dry.	0 m - A: 0 - 0.35 m 0.35 m - B: 0.35 - 0.55 m
						SILT (0.35 to 0.55) SILT; some gravel; fine to coarse grained; low plasticity, sub angular to sub rounded, poorly graded, medium brown, dry. [Loess]	
1.0	1006.0	G B	TP14-148-1			**GRAVELLY SILT** (0.55 to 4.68) Gravelly; SILT; trace cobbles; fine to coarse grained, non-plastic, sub angular to sub rounded, gap graded, light brown, dry. Cobble content increasing with depth. Trace boulders near base of pit. [Glacial Till]	
2.0	1005.0						
3.0	1004.0						
4.0	1003.0						
5.0	1002.0					End of Test Pit: 4.68 m Limit of excavator	
	1001.0						

GENERAL REMARKS:
Pit walls stable and open. No groundwater.

SAMPLING SYMBOLS:
G B GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-148

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-149
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 19 Sep 14

Location: TSF Basin
Total Depth: 3.55 m
Date Completed: 19 Sep 14

Coordinates: 683,368 E , 5,606,288 N UTM NAD83 ZONE10
Elevation: 1022.9 m
Logged by: JEF

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1022.9					**TOPSOIL/ORGANICS** (0 to 0.07) ORGANICS; root mat; and TOPSOIL; SILT; some gravel; fine to coarse grained; low plasticity, sub angular to sub rounded, poorly graded, dark brown, dry.	0 m - A: 0 - 0.07 m 0.07 m - B: 0.07 - 0.35 m
						SILT (0.07 to 0.35) SILT; some gravel; fine to coarse grained; low plasticity, sub angular to sub rounded, poorly graded, medium brown, dry. [Loess]	
1.0	1022.0					**GRAVELLY SILT** (0.35 to 3.55) Gravelly; SILT; some cobbles; fine to coarse grained, non-plastic, sub angular to sub rounded, gap graded, light brown, dry. [Colluvium]	
2.0	1021.0	G B	TP14-149-1				
3.0	1020.0						
3.55	1019.3					End of Test Pit: 3.55 m Refusal on boulder	
4.0	1019.0						
5.0	1018.0						
	1017.0						

GENERAL REMARKS:
Pit walls stable and open. No groundwater.

SAMPLING SYMBOLS:
G B GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-149

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-150
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 19 Sep 14

Location: South Embankment
Total Depth: 3.92 m
Date Completed: 19 Sep 14

Coordinates: 683,299 E , 5,606,099 N UTM NAD83 ZONE10
Elevation: 1031.2 m
Logged by: JEF

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1031.0					**TOPSOIL/ORGANICS** (0 to 0.2) ORGANICS; root mat; and TOPSOIL; SILT; trace gravel; fine grained; sub angular to sub rounded, low plasticity, poorly graded, dark brown, dry.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.45 m
						SILT (0.2 to 0.45) SILT; trace gravel; fine grained; sub angular to sub rounded, low plasticity, poorly graded, medium brown, dry.	
1.0	1030.0					**GRAVELLY SILT** (0.45 to 3.92) gravelly SILT; trace sand; fine to coarse grained; non-plastic, sub angular to sub rounded, poorly graded, light brown, dry. [Glacial Till]	
2.0	1029.0						
3.0	1028.0						
4.0	1027.0					End of Test Pit: 3.92 m Refusal on dense material	
5.0	1026.0						

GENERAL REMARKS:
Pit walls stable and open. No groundwater.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-150

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-151
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 20 Aug 14

Location: South Embankment
Total Depth: 4.85 m
Date Completed: 20 Aug 14

Coordinates: 683,405 E , 5,605,975 N UTM NAD83 ZONE10
Elevation: 1022.8 m
Logged by: JEF

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1022.8					**TOPSOIL/ORGANICS** (0 to 0.17) ORGANICS; root mat; and TOPSOIL; SILT; trace gravel; fine grained; sub angular to sub rounded, low plasticity, poorly graded, dark brown, dry to moist.	0 m - A: 0 - 0.17 m 0.17 m - B: 0.17 - 0.48 m
						SILT (0.17 to 0.48) SILT; some gravel; fine to coarse grained; low plasticity, sub angular to sub rounded, poorly graded, medium brown, dry. [Loess]	
1.0	1022.0					**GRAVELLY SILT** (0.48 to 4.85) Gravelly; SILT; trace cobbles, fine to coarse grained, non-plastic, sub angular to sub rounded, gap graded, light brown, dry. Cobble content increasing with depth. [Glacial Till]	
2.0	1021.0						
3.0	1020.0						
4.0	1019.0						
5.0	1018.0					End of Test Pit: 4.85 m Limit of excavator	
	1017.0						

GENERAL REMARKS:
Pit walls stable and open. No groundwater.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-151

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-152
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 20 Aug 14

Location: TSF Basin
Total Depth: 4.51 m
Date Completed: 20 Aug 14

Coordinates: 683,210 E , 5,606,198 N UTM NAD83 ZONE10
Elevation: 1037.6 m
Logged by: JEF

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1037.6					**TOPSOIL/ORGANICS** (0 to 0.2) ORGANICS; root mat; and TOPSOIL; SILT; trace gravel; fine grained; sub angular to sub rounded, low plasticity, poorly graded, very dark brown, dry to moist.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.38 m
						SILT (0.2 to 0.38) SILT; some gravel; fine to coarse grained; low plasticity, sub angular to sub rounded, poorly graded, medium brown, dry. [Loess]	
1.0	1036.0					**GRAVELLY SILT** (0.38 to 4.51) SILT and GRAVEL; trace cobbles; fine to coarse grained, non-plastic, sub angular to sub rounded, gap graded, light brown, dry. [Glacial Till]	
2.0	1035.0						
3.0	1034.0						
4.0	1033.0					End of Test Pit: 4.51 m Refusal on dense material	
5.0	1032.0						

GENERAL REMARKS:
Pit walls stable and open. No groundwater.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-152

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-153
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 20 Aug 14

Location: TSF Basin
Total Depth: 2 m
Date Completed: 20 Aug 14

Coordinates: 683,592 E , 5,606,627 N UTM NAD83 ZONE10
Elevation: 994.4 m
Logged by: JEF

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	994.0					**TOPSOIL/ORGANICS** (0 to 0.17) ORGANICS; root mat; and TOPSOIL; SILT; trace sand; trace gravel; fine grained; low plasticity, poorly graded, dark brown, dry.	0 m - A: 0 - 0.14 m 0.14 m - B: 0.14 - 0.66 m
						SILT (0.17 to 0.66) SILT; trace gravel; fine grained; low plasticity, poorly graded, medium brown, dry. [Loess]	0.66 m - Proctor Sample - 3 Buckets
1.0	993.0	GB	Proctor-001			**SILT AND GRAVEL** (0.66 to 2) Silty GRAVEL; some cobbles; fine to coarse grained, non-plastic, angular to rounded, gap graded, light brown, loose to moderately dense, very dry. [Glaciofluvial]	
2.0	992.0					End of Test Pit: 2 m Wall Instability	
3.0	991.0						
4.0	990.0						
5.0	989.0						

GENERAL REMARKS:
Pit walls collapsing. No groundwater.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-153

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-154
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 20 Aug 14

Location: TSF Basin
Total Depth: 4.4 m
Date Completed: 20 Aug 14

Coordinates: 683,498 E , 5,606,792 N UTM NAD83 ZONE10
Elevation: 974.4 m
Logged by: JEF

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	974.0					**TOPSOIL/ORGANICS** (0 to 0.15) ORGANICS; root mat; and TOPSOIL; SILT; some gravel; fine to coarse grained; low plasticity, sub angular to sub rounded, poorly graded, dark brown, dry.	0 m - A: 0 - 0.15 m 0.15 m - B: 0.15 - 0.5 m
						SILT (0.15 to 0.5) SILT; some gravel; fine to coarse grained; low plasticity, sub angular to sub rounded, poorly graded, medium brown, dry. [Loess]	
1.0						**SILT AND GRAVEL** (0.5 to 4.4) Silty GRAVEL; trace sand; trace cobbles; fine to coarse grained, non-plastic, sub angular to rounded, poorly graded, light brown, dry. [Glaciofluvial]	
	973.0						
2.0							
	972.0	G B	TP14-154-1				
3.0							
	971.0						
4.0							
	970.0					End of Test Pit: 4.4 m Refusal on dense till material.	
5.0							
	969.0						

GENERAL REMARKS:
Pit walls stable and open. No groundwater.

SAMPLING SYMBOLS:
G B GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-154

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-155
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 20 Aug 14

Location: TSF Basin
Total Depth: 4.3 m
Date Completed: 20 Aug 14

Coordinates: 683,746 E , 5,606,730 N UTM NAD83 ZONE10
Elevation: 992.1 m
Logged by: JEF

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	992.0					**TOPSOIL/ORGANICS** (0 to 0.2) ORGANICS; root mat; and TOPSOIL; SILT; some gravel; fine to coarse grained; low plasticity, sub angular to sub rounded, poorly graded, dark brown.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.47 m
						SILT (0.2 to 0.47) SILT; some gravel; fine to coarse grained; low plasticity, sub angular to sub rounded, poorly graded, medium brown, dry. [Loess]	
1.0	991.0					**COBBLY SILT** (0.47 to 2) COBBLY; SILT; some gravel; fine to coarse grained, non-plastic, sub angular to rounded, gap graded, light brown, dry. [Glaciofluvial]	
2.0	990.0					**GRAVELLY SILT** (2 to 4.3) Gravelly; SILT; trace cobbles, fine to coarse grained, non-plastic, sub angular to sub rounded, gap graded, brown, dry. [Glaciofluvial]	
3.0	989.0						
4.0	988.0					End of Test Pit: 4.3 m Wall Instability	
5.0	987.0						

GENERAL REMARKS:
Pit walls collapsing. No groundwater.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-155

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-156
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 20 Aug 14

Location: TSF Basin
Total Depth: 5 m
Date Completed: 20 Aug 14

Coordinates: 683,637 E , 5,606,897 N UTM NAD83 ZONE10
Elevation: 961 m
Logged by: JEF

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
						TOPSOIL/ORGANICS (0 to 0.25) ORGANICS; root mat; and TOPSOIL; SILT; trace gravel; fine grained; low plasticity, sub angular to sub rounded, poorly graded, dark brown, dry.	0 m - A: 0 - 0.25 m 0.25 m - B: 0.25 - 0.6 m
						SILT (0.25 to 0.6) SILT; some gravel; fine to coarse grained; low plasticity, sub angular to sub rounded, poorly graded, dark brown, dry.	
1.0	960.0					**GRAVELLY SILT** (0.6 to 5) Gravelly; SILT; trace cobbles, fine to coarse grained, non-plastic, sub angular to sub rounded, gap graded, light brown, dry. [Glaciofluvial]	1.6 m - Groundwater Seepage at 1.6 m
2.0	959.0						
3.0	958.0						
4.0	957.0						
5.0	956.0					End of Test Pit: 5 m Limit of excavator	

GENERAL REMARKS:
Pit walls stable and open. No groundwater.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-156

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-157
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 21 Aug 14

Location: TSF Basin
Total Depth: 5.05 m
Date Completed: 21 Aug 14

Coordinates: 683,585 E , 5,607,088 N UTM NAD83 ZONE10
Elevation: 947.3 m
Logged by: JEF

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	947.0					**TOPSOIL/ORGANICS** (0 to 0.15) ORGANICS; root mat; and TOPSOIL; SILT; trace gravel; fine grained; low plasticity, sub angular to sub rounded, poorly graded, dark brown.	0 m - A: 0 - 0.15 m 0.15 m - B: 0.15 - 0.36 m
						SILT (0.15 to 0.36) SILT; trace gravel; fine grained; low plasticity, sub angular to sub rounded, poorly graded, brown. [Loess]	
1.0	946.0	G B	TP14-157-1			**SILT** (0.36 to 5.05) SILT; trace gravel; fine grained; low to medium plasticity, sub angular to sub rounded, poorly graded, brownish-grey, dry to moist. [Loess]	
2.0	945.0						
3.0	944.0						
4.0	943.0						
5.0	942.0					End of Test Pit: 5.05 m Limit of excavator	

GENERAL REMARKS:
Pit walls stable and open. No groundwater.

SAMPLING SYMBOLS:
G B GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-157

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-158
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 21 Aug 14

Location: TSF Basin
Total Depth: 4.85 m
Date Completed: 21 Aug 14

Coordinates: 684,447 E , 5,606,528 N UTM NAD83 ZONE10
Elevation: 976.2 m
Logged by: JEF

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	976.0					**TOPSOIL/ORGANICS** (0 to 0.22) ORGANICS; root mat; and TOPSOIL; SILT; trace gravel; fine grained; low plasticity, sub angular to sub rounded, poorly graded, dark brown.	0 m - A: 0 - 0.22 m 0.22 m - B: 0.22 - 0.36 m
						SILT (0.22 to 0.36) SILT; trace gravel; fine grained; low plasticity, sub angular to sub rounded, poorly graded, brown, dry. [Loess]	
1.0	975.0					**SILT** (0.36 to 4.85) SILT; fine grained, low to medium plasticity, uniformly graded, medium brown, dry. [Loess]	
2.0	974.0						
3.0	973.0						
4.0	972.0						
5.0	971.0					End of Test Pit: 4.85 m Limit of excavator	

GENERAL REMARKS:
Pit walls stable and open. No groundwater.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-158

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-159
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 21 Aug 14

Location: TSF Basin
Total Depth: 4.95 m
Date Completed: 21 Aug 14

Coordinates: 684,214 E , 5,606,629 N UTM NAD83 ZONE10
Elevation: 998.1 m
Logged by: JEF

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	998.0					**TOPSOIL/ORGANICS** (0 to 0.2) ORGANICS; root mat; and TOPSOIL; SILT; some gravel; fine to coarse grained; low plasticity, sub angular to sub rounded, poorly graded, dark brown, dry.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.45 m
						SILT (0.2 to 0.45) SILT; some gravel; fine to coarse grained; low plasticity, sub angular to sub rounded, poorly graded, medium brown, dry. [Loess]	
1.0	997.0					**SILTY GRAVEL AND COBBLES** (0.45 to 1.2) Silty GRAVEL and COBBLES; fine to coarse grained, non-plastic, sub angular to rounded, poorly graded, light to medium brown, dry. [Glaciofluvial]	
						GRAVELLY SILT (1.2 to 4.95) Gravelly; SILT; some cobbles, fine to coarse grained, non-plastic, sub angular to rounded, gap graded, light brown, dry. [Glacial Till]	
2.0	996.0						
3.0	995.0						
4.0	994.0						
5.0	993.0					End of Test Pit: 4.95 m Limit of excavator	

GENERAL REMARKS:
Pit walls stable and open. No groundwater.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-159

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-160
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 21 Aug 14

Location: TSF Basin
Total Depth: 4.85 m
Date Completed: 21 Aug 14

Coordinates: 684,359 E , 5,606,486 N UTM NAD83 ZONE10
Elevation: 991.9 m
Logged by: JEF

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	991.9					**TOPSOIL/ORGANICS** (0 to 0.22) ORGANICS; root mat; and TOPSOIL; SILT; some gravel; fine to coarse grained; low plasticity, sub angular to sub rounded, poorly graded, dark brown, dry.	0 m - A: 0 - 0.22 m 0.22 m - B: 0.22 - 0.54 m
						SILT (0.22 to 0.54) SILT; some gravel; fine to coarse grained; low plasticity, sub angular to sub rounded, poorly graded, brown, dry. [Loess]	
1.0	991.0					**SILT AND GRAVEL** (0.54 to 2.65) SILT and GRAVEL; trace cobbles; fine to coarse grained, non-plastic, sub angular to sub rounded, gap graded, light brown, dry. [Loess]	
2.0	990.0						
3.0	989.0					**SANDY SILT** (2.65 to 4.85) Sandy SILT; some gravel; fine to coarse grained; non-plastic, well graded, light brown, dry. [Loess]	
4.0	988.0						
5.0	987.0					End of Test Pit: 4.85 m Limit of excavator	
	986.0						

GENERAL REMARKS:
Pit walls stable and open. No groundwater.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-160

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-161
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 21 Aug 14

Location: TSF Basin
Total Depth: 4.55 m
Date Completed: 21 Aug 14

Coordinates: 684,472 E , 5,606,347 N UTM NAD83 ZONE10
Elevation: 986.1 m
Logged by: JEF

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	986.0					**TOPSOIL/ORGANICS** (0 to 0.31) ORGANICS; root mat; and TOPSOIL; SILT; trace gravel; fine grained; low plasticity, sub angular to sub rounded, poorly graded, dark brown, dry.	0 m - A: 0 - 0.31 m 0.31 m - B: 0.31 - 0.41 m
						SILT (0.31 to 0.41) SILT; trace gravel; fine grained; low plasticity, sub angular to sub rounded, poorly graded, brown, dry. [Loess]	
1.0	985.0					**SILT** (0.41 to 1.55) SILT; trace gravel; fine grained; low to medium plasticity, sub angular to sub rounded, poorly graded, light brown, dry. [Loess]	
2.0	984.0					**SILT** (1.55 to 4.55) SILT; fine grained, medium plasticity, uniformly graded, light brown, dry. [Loess]	
3.0	983.0						
4.0	982.0						
4.55	981.5					End of Test Pit: 4.55 m Limit of excavator	
5.0	981.0						

GENERAL REMARKS:
Pit walls stable and open. No groundwater.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-161

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, TEST PIT LOG, 2014 KP DATA TEMPLATE REVB.GDT, 17-Mar-15

Project: AJAX PROJECT
Test Pit No.: TP14-162
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 22 Aug 14

Location: TSF Basin
Total Depth: 5.2 m
Date Completed: 22 Aug 14

Coordinates: 684,527 E , 5,606,095 N UTM NAD83 ZONE10
Elevation: 995.5 m
Logged by: JEF

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	995.0					**TOPSOIL/ORGANICS** (0 to 0.21) ORGANICS; root mat; and TOPSOIL; SILT; trace gravel; fine grained; low plasticity, sub angular to sub rounded, poorly graded, dark brown, dry.	0 m - A: 0 - 0.21 m 0.21 m - B: 0.21 - 0.9 m
						SILT (0.21 to 0.9) SILT; some sand; trace gravel; fine to coarse grained; low plasticity, sub angular to sub rounded, well graded, brown, dry. [Loess]	
1.0						**SILTY SAND** (0.9 to 3.3) Silty SAND; some gravel; fine to coarse grained, non-plastic, sub angular to rounded, well graded, brown, dry. [Loess]	
2.0	994.0						
	993.0						
3.0							
	992.0					**SILT** (3.3 to 5.2) SILT; medium plasticity, uniformly graded, light brown, dry. [Loess]	
4.0							
	991.0						
5.0							
	990.0					End of Test Pit: 5.2 m Limit of excavator	

GENERAL REMARKS:
Pit walls stable and open. No groundwater.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-162

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-163
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 22 Aug 14

Location: TSF Basin
Total Depth: 4.95 m
Date Completed: 22 Aug 14

Coordinates: 684,380 E , 5,605,993 N UTM NAD83 ZONE10
Elevation: 1009.4 m
Logged by: JEF

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1009.0					**TOPSOIL/ORGANICS** (0 to 0.53) ORGANICS; root mat; and TOPSOIL; SILT; trace gravel; fine grained; low plasticity, sub angular to sub rounded, poorly graded, dark brown to black, loose, dry.	0 m - A: 0 - 0.53 m
						SILT (0.53 to 0.7) SILT; trace gravel; fine grained; low plasticity, sub angular to sub rounded, poorly graded, medium to dark brown, loose, dry. [Loess]	0.53 m - B: 0.53 - 0.7 m
1.0	1008.0					**SILT** (0.7 to 2.4) SILT; some sand; some gravel; trace cobbles; fine to coarse grained; non-plastic, sub angular to sub rounded, well graded, brown, dry. [Loess]	
2.0	1007.0					**SILT** (2.4 to 4.95) SILT; trace gravel; fine grained; medium plasticity, sub angular to sub rounded, poorly graded, brown, dry. [Loess]	
3.0	1006.0						
4.0	1005.0						
5.0	1004.0					End of Test Pit: 4.95 m Limit of excavator	

GENERAL REMARKS:
Pit walls stable and open. No groundwater.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-163

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-164
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 22 Aug 14

Location: TSF Basin
Total Depth: 2.6 m
Date Completed: 22 Aug 14

Coordinates: 684,417 E , 5,605,795 N UTM NAD83 ZONE10
Elevation: 1022.2 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1022.0					**TOPSOIL/ORGANICS** (0 to 0.3) ORGANICS; root mat; and TOPSOIL; SILT; some sand; trace gravel; fine grained; low plasticity, sub angular to rounded, poorly graded, dark brown, massive, loose, dry to moist.	0 m - A: 0 - 0.3 m 0.3 m - B: 0.3 - 1.1 m
1.0	1021.0					**SILTY SAND** (0.3 to 1.1) Silty SAND; some gravel; fine to coarse grained, low plasticity, sub angular to sub rounded, well graded, medium brown, massive, very dense, dry.	
2.0	1020.0					**SANDY GRAVELLY SILT** (1.1 to 2.6) Sandy Gravelly SILT; trace boulders; fine to coarse grained; low plasticity, sub angular to sub rounded, well graded, dark greyish-brown, massive, very dense, dry to moist. [Glacial Till]	
3.0	1019.0					**WEATHERED BEDROCK** (2.6) Light grey-green, massive, slightly weathered, strong, mafic volcanics End of Test Pit: 2.6 m Refusal on possible bedrock	
4.0	1018.0						
5.0	1017.0						

GENERAL REMARKS:
Pit walls stable, no groundwater, no excavation difficulties.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-164

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-165
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 22 Aug 14

Location: TSF Basin
Total Depth: 4.9 m
Date Completed: 22 Aug 14

Coordinates: 684,326 E , 5,606,183 N UTM NAD83 ZONE10
Elevation: 1006.3 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1006.0					**TOPSOIL/ORGANICS** (0 to 0.4) ORGANICS; root mat; and TOPSOIL; SILT; some sand; trace gravel; fine grained; non-plastic, sub angular to sub rounded, poorly graded, dark brown, massive, loose, dry to moist.	0 m - A: 0 - 0.4 m 0.4 m - B: 0.4 - 0.7 m
						SILT (0.4 to 0.7) SILT; some sand; trace gravel; fine grained; non-plastic, sub angular to sub rounded, poorly graded, medium brown, massive, moderately dense, dry. [Loess]	
1.0	1005.0					**SILTY GRAVELLY SAND** (0.7 to 4.9) Silty gravelly SAND; trace cobbles; fine to coarse grained, low plasticity, sub angular to sub rounded, well graded, dark greyish-brown, massive, very dense, dry to moist. [Glacial Till]	
2.0	1004.0						
3.0	1003.0						
4.0	1002.0	GB	TP14-165-1				
5.0	1001.0					End of Test Pit: 4.9 m Limit of excavator	

GENERAL REMARKS:
Pit walls stable, no groundwater, no excavation difficulties.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-165

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-166
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 23 Aug 14

Location: SMRSF
Total Depth: 4.8 m
Date Completed: 23 Aug 14

Coordinates: 685,121 E , 5,607,665 N UTM NAD83 ZONE10
Elevation: 985.2 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	985.0					**TOPSOIL/ORGANICS** (0 to 0.2) ORGANICS; root mat; and TOPSOIL; SILT; some sand; trace gravel; fine grained; non-plastic, sub angular to rounded, poorly graded, dark brown, massive, loose, dry to moist.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.3 m 0.3 m - C: 0.3 - 1.0 m
						SILT (0.2 to 0.3) SILT; some sand; trace gravel; fine grained; non-plastic, sub angular to sub rounded, poorly graded, light yellowish-brown, massive, dense, dry. [Loess]	
1.0	984.0					**SILTY GRAVELLY SAND** (0.3 to 1) Silty gravelly SAND; trace cobbles; fine to coarse grained, low to medium plasticity, sub angular to sub rounded, well graded, brownish-grey, massive, very dense, dry. [Glacial Till]	
						SANDY GRAVELLY SILT (1 to 4.8) Sandy Gravelly SILT; trace cobbles; fine to coarse grained; low to medium plasticity, sub angular to sub rounded, well graded, dark greyish-brown, massive, very dense, moist. [Glacial Till]	
2.0	983.0						
3.0	982.0						
4.0	981.0						
4.8						End of Test Pit: 4.8 m Limit of excavator	
5.0	980.0						

GENERAL REMARKS:
Pit walls stable, no groundwater, excavation difficult after ~1.5 m.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-166

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-167
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 23 Aug 14

Location: East Embankment
Total Depth: 5 m
Date Completed: 23 Aug 14

Coordinates: 685,245 E , 5,607,134 N UTM NAD83 ZONE10
Elevation: 1040.2 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1040.0					**TOPSOIL/ORGANICS** (0 to 0.3) ORGANICS; root mat; and TOPSOIL; SILT; some sand; trace gravel; fine grained; low plasticity, sub angular to rounded, poorly graded, very dark brown, massive, loose, moist to dry.	0 m - A: 0 - 0.3 m 0.3 m - B: 0.3 - 0.5 m 0.5 m - C: 0.5 - 1.5 m
						SILTY SAND (0.3 to 0.5) Sandy SILT; some gravel; fine to coarse grained; non-plastic, sub angular to sub rounded, poorly graded, light to medium brown, massive, moderately dense, dry. [Loess]	
1.0	1039.0					**SANDY GRAVELLY SILT** (0.5 to 1.5) Sandy Gravelly SILT; trace cobbles; fine to coarse grained; non-plastic, sub angular to sub rounded, poorly graded, light grey, massive, moderately dense, dry. [Glaciofluvial?]	
						SILTY GRAVELLY SAND (1.5 to 5) Silty gravelly SAND; trace cobbles; fine to coarse grained, low to medium plasticity, sub angular to sub rounded, well graded, dark greyish-brown, massive, very dense, moist. [Glaciofluvial?]	
2.0	1038.0						
3.0	1037.0						
4.0	1036.0						
5.0	1035.0	G B	TP14-167-1			End of Test Pit: 5 m Limit of excavator	

GENERAL REMARKS:
Pit walls stable, no groundwater, excavation difficult after ~1.5 m.

SAMPLING SYMBOLS:
G B GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-167

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-168
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 23 Aug 14

Location: East Embankment
Total Depth: 1.1 m
Date Completed: 23 Aug 14

Coordinates: 685,046 E , 5,607,255 N UTM NAD83 ZONE10
Elevation: 1034.5 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1034.5					**TOPSOIL/ORGANICS** (0 to 0.2) ORGANICS; root mat; and TOPSOIL; SILT; some sand; trace gravel; fine grained; non-plastic, sub angular to rounded, poorly graded, dark brown, massive, loose, moist.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.5 m
0.5	1034.0					**SILTY SAND** (0.2 to 0.5) Silty SAND; some gravel; fine to coarse grained, non-plastic, sub angular to sub rounded, poorly graded, medium to light brown, massive, moderately dense, dry.	0.5 m - C: 0.5 - 1.1 m
1.0	1033.5					**SILTY SAND AND GRAVEL** (0.5 to 1.1) Silty SAND and GRAVEL; trace cobbles; fine to coarse grained, non-plastic, angular, well graded, massive, dense, dry. [Colluvium]	
1.1	1033.4					End of Test Pit: 1.1 m Refusal on possible bedrock	
2.0	1032.5						
3.0	1031.5						
4.0	1030.5						
5.0	1029.5						

GENERAL REMARKS:
Pit walls sloughing due to loose sand and silt, no groundwater.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-168

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-169
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 23 Aug 14

Location: East Embankment
Total Depth: 4.3 m
Date Completed: 23 Aug 14

Coordinates: 684,872 E , 5,607,034 N UTM NAD83 ZONE10
Elevation: 982.8 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	982.8					**TOPSOIL/ORGANICS** (0 to 0.1) ORGANICS; root mat; and TOPSOIL; SILT; some sand; fine grained; sub angular to rounded, poorly graded, dark brown, massive, loose, dry.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.6 m
						SILT (0.1 to 0.6) SILT; some sand; trace gravel; fine grained; non-plastic, sub angular to sub rounded, poorly graded, dark greyish-brown, massive, dense, dry.	
1.0	982.0					**SILTY SAND** (0.6 to 4) Silty SAND; some gravel; trace clay; trace boulders; fine to coarse grained, non-plastic, sub angular to sub rounded, gap graded, medium to dark brown, massive, dense, dry. [Colluvium]	
2.0	981.0						
3.0	980.0						
4.0	979.0					**WEATHERED BEDROCK** (4 to 4.3) Light grey-green, massive, slightly weathered, strong, mafic volcanics	
5.0	978.0					End of Test Pit: 4.3 m Refusal on highly weathered bedrock	
	977.0						

GENERAL REMARKS:
Pit walls stable, no groundwater, difficult excavation due to boulders.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-169

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-170
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 23 Aug 14

Location: East Embankment
Total Depth: 1.6 m
Date Completed: 23 Aug 14

Coordinates: 684,860 E , 5,606,926 N UTM NAD83 ZONE10
Elevation: 980.5 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	980.5					**TOPSOIL/ORGANICS** (0 to 0.2) ORGANICS; root mat; and TOPSOIL; SILT; trace sand; fine grained; non-plastic, sub angular to rounded, poorly graded, dark brown, massive, loose, dry.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 1.1 m
	980.0					**SANDY SILT** (0.2 to 1.1) Sandy SILT; trace gravel; trace cobbles; fine grained; non-plastic, angular to sub rounded, poorly graded, massive, moderately dense to dense, dry.	
1.0							1.1 m - C: 1.1 - 1.6 m
	979.0					**SILTY SAND AND GRAVEL** (1.1 to 1.6) Silty SAND and GRAVEL; trace cobbles; fine to coarse grained, angular to sub rounded, well graded, non plastic, dry. [Colluvium]	
						WEATHERED BEDROCK (1.6) Light grey-green, massive, slightly weathered, strong, mafic volcanics End of Test Pit: 1.6 m Refusal on bedrock	
2.0	978.0						
3.0	977.0						
4.0	976.0						
5.0	975.0						

GENERAL REMARKS:
Pit walls stable, no groundwater.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-170

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Contractor: Cobra Contracting Ltd.
Location: TSF Basin
Coordinates: 684,818 E , 5,606,767 N UTM NAD83 ZONE10

Test Pit No.: TP14-171
Equipment Used: CAT 320D L
Total Depth: 2.3 m
Elevation: 977 m

Page: 1 of 1
Date Started: 23 Aug 14
Date Completed: 23 Aug 14
Logged by: MAP
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0						**TOPSOIL/ORGANICS** (0 to 0.2) ORGANICS; root mat; and TOPSOIL; SILT; trace sand; trace gravel; fine grained; non-plastic, angular to rounded, poorly graded, dark brown, massive, loose, dry.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.5 m
						SILT (0.2 to 0.5) SILT; trace sand; trace gravel; fine grained; non-plastic, sub angular to sub rounded, poorly graded, medium brown, massive, moderately dense, dry. [Loess]	
1.0	976.0					**SANDY SILT** (0.5 to 2.3) Sandy SILT; some gravel; trace cobbles; fine to coarse grained; non-plastic, sub angular to sub rounded, well graded, light greyish-brown, massive, dry. [Glacial Till]	
2.0	975.0						
						WEATHERED BEDROCK (2.3) Light grey-green, massive, slightly weathered, strong, mafic volcanics End of Test Pit: 2.3 m Refusal on bedrock	
3.0	974.0						
4.0	973.0						
5.0	972.0						

GENERAL REMARKS:
Pit walls stable, no groundwater.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-171

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-172
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 25 Aug 14

Location: TSF Basin
Total Depth: 5 m
Date Completed: 25 Aug 14

Coordinates: 684,973 E , 5,606,405 N UTM NAD83 ZONE10
Elevation: 1030.7 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1030.0					**TOPSOIL/ORGANICS** (0 to 0.1) ORGANICS; root mat; and TOPSOIL; SILT; some sand; fine grained; non-plastic, poorly graded, dark brown, massive, loose, moist.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.2 m 0.2 m - C: 0.2 - 0.5 m
						SILT (0.1 to 0.2) SILT; some sand; fine grained; non-plastic, poorly graded, light to medium brown, massive, loose, moist.	
1.0						**SILTY SANDY GRAVEL** (0.2 to 0.5) Silty sandy GRAVEL; fine to coarse grained, non-plastic, sub angular to sub rounded, well graded, light grey, massive, dense, dry. [Glacial Till]	
	1029.0					**SILTY GRAVELLY SAND** (0.5 to 5) Silty gravelly SAND; trace cobbles; fine to coarse grained, low plasticity, sub angular to sub rounded, well graded, light to dark greyish brown, massive, very dense, dry to moist. [Glacial Till]	
2.0							
	1028.0						
3.0							
	1027.0						
4.0							
	1026.0						
5.0						End of Test Pit: 5 m Limit of excavator	
	1025.0						

GENERAL REMARKS:
Pit walls stable, no groundwater, difficult to excavate after 1 m.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-172

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Contractor: Cobra Contracting Ltd.
Location: TSF Basin
Coordinates: 685,102 E , 5,606,463 N UTM NAD83 ZONE10

Test Pit No.: TP14-173
Equipment Used: CAT 320D L
Total Depth: 1.7 m
Elevation: 1048 m

Page: 1 of 1
Date Started: 25 Aug 14
Date Completed: 25 Aug 14
Logged by: MAP
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0						**TOPSOIL/ORGANICS** (0 to 0.2) ORGANICS; root mat; and TOPSOIL; SILT; some sand; fine grained; non-plastic, poorly graded, dark brown, massive, loose, dry to moist.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.7 m
						SILT AND SAND (0.2 to 0.7) SILT and SAND; trace gravel; trace cobbles; fine grained, non-plastic, sub angular to sub rounded, poorly graded, medium greyish brown, massive, moderately dense to dense, dry. [Loess]	
1.0	1047.0					**SILT AND SAND** (0.7 to 1.7) SILT and SAND; trace gravel; trace cobbles; fine grained, non-plastic, angular, poorly graded, medium greyish brown, massive, dense, dry. [Loess]	
2.0	1046.0					**WEATHERED BEDROCK** (1.7) Light grey-green, massive, slightly weathered, strong, mafic volcanics End of Test Pit: 1.7 m Refusal on weathered bedrock	
3.0	1045.0						
4.0	1044.0						
5.0	1043.0						

GENERAL REMARKS:
Pit walls stable.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-173

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-174
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 25 Aug 14

Location: TSF Basin
Total Depth: 4.7 m
Date Completed: 25 Aug 14

Coordinates: 685,100 E , 5,606,465 N UTM NAD83 ZONE10
Elevation: 1048.4 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1048.0					**TOPSOIL/ORGANICS** (0 to 0.2) ORGANICS; root mat; and TOPSOIL; SILT; some sand; trace gravel; fine grained; non-plastic, sub angular to rounded, poorly graded, dark brown, massive, loose, moist.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.4 m
						SILT (0.2 to 0.4) SILT; some sand; some gravel; fine to coarse grained; non-plastic, sub angular to rounded, poorly graded, medium brown, massive, moderately dense, moist. [Loess]	
1.0	1047.0					**SILTY GRAVELLY SAND** (0.4 to 1.5) Silty gravelly SAND; trace cobbles; fine to coarse grained, non-plastic, angular to sub rounded, well graded, light greyish brown, massive, dense, dry.	
						SILTY GRAVELLY SAND (1.5 to 4.7) Silty gravelly SAND; trace cobbles; fine to coarse grained, non-plastic, angular to sub rounded, well graded, dark greyish brown, massive, dense, moist. [Glacial Till]	
2.0	1046.0						
3.0	1045.0						
4.0	1044.0	G B	TP14-174-1			End of Test Pit: 4.7 m Limit of excavator	
5.0	1043.0						

GENERAL REMARKS:
Pit walls stable, no groundwater, no excavation difficulties.

SAMPLING SYMBOLS:
G B GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-174

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, TEST PIT LOG, 2014 KP DATA TEMPLATE REVB.GDT, 17-Mar-15

Project: AJAX PROJECT
Test Pit No.: TP14-175
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 25 Aug 14

Location: TSF Basin
Total Depth: 5.2 m
Date Completed: 25 Aug 14

Coordinates: 685,274 E , 5,606,353 N UTM NAD83 ZONE10
Elevation: 1061.3 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1061.0					**TOPSOIL/ORGANICS** (0 to 0.3) ORGANICS; root mat; and TOPSOIL; SILT; some sand; trace gravel; fine grained; non-plastic, sub angular to rounded, poorly graded, dark brown, massive, loose, moist.	0 m - A: 0 - 0.3 m 0.3 m - B: 0.3 - 0.5 m
						SILT (0.3 to 0.5) SILT; some sand; trace gravel; fine grained; non-plastic, sub angular to rounded, poorly graded, medium brown, massive, moderately dense, moist. [Loess]	0.5 m - C: 0.5 - 1.1 m
1.0	1060.0					**SILTY GRAVELLY SAND** (0.5 to 1.1) Silty gravelly SAND, fine to coarse grained, low plasticity, angular to sub rounded, well graded, light to dark greyish brown, massive, dense, dry.	
						SILTY SANDY GRAVEL (1.1 to 5.2) Silty sandy GRAVEL; trace cobbles; fine to coarse grained, high plasticity, angular to sub rounded, well graded, dark greenish-grey, massive, dense, moist to saturated. [Glacial Till]	
2.0	1059.0						
3.0	1058.0						
4.0	1057.0						
5.0		G B	TP14-175-1				
	1056.0					End of Test Pit: 5.2 m Limit of excavator	

GENERAL REMARKS:
Pit walls stable, no groundwater, no excavation difficulties.

SAMPLING SYMBOLS:
G B GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-175

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-176
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 25 Aug 14

Location: TSF Basin
Total Depth: 5 m
Date Completed: 25 Aug 14

Coordinates: 685,110 E , 5,606,279 N UTM NAD83 ZONE10
Elevation: 1038.7 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1038.0					**TOPSOIL/ORGANICS** (0 to 0.2) ORGANICS; root mat; and TOPSOIL; Sandy SILT; trace gravel, fine to coarse grained, non plastic, angular to rounded; poorly graded, dark brown, massive, loose, dry.	0 m - A: 0 - 0.2 m 0.2 m - C: 0.2 - 0.6 m
1.0						**SILTY GRAVELLY SAND** (0.2 to 1) Silty gravelly SAND; trace cobbles; fine to coarse grained, sub angular to sub rounded, well graded, light greyish brown, massive, dense, dry.	
	1037.0					**SILTY SANDY GRAVEL** (1 to 5) Silty SAND and GRAVEL; trace cobbles; trace boulders; fine to coarse grained, sub angular to sub rounded, well graded, non plastic, dark greyish-brown, very dense, moist. [Glacial Till]	
2.0							
	1036.0						
3.0							
	1035.0						
4.0							
	1034.0						
5.0						End of Test Pit: 5 m Limit of excavator	
	1033.0						

GENERAL REMARKS:
Pit walls stable, no groundwater, difficult excavation after 0.5 m.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-176

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-177
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 26 Aug 14

Location: TSF Basin
Total Depth: 4.9 m
Date Completed: 26 Aug 14

Coordinates: 685,288 E , 5,606,518 N UTM NAD83 ZONE10
Elevation: 1090.6 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1090.0					**TOPSOIL/ORGANICS** (0 to 0.3) ORGANICS; root mat; and TOPSOIL; SILT; some sand; trace gravel; fine grained; sub angular to rounded, poorly graded, dark brown, massive, loose, moist.	0 m - A: 0 - 0.3 m 0.3 m - C: 0.3 - 0.7 m
						SILTY SANDY GRAVEL (0.3 to 0.7) Silty sandy GRAVEL; trace cobbles; fine to coarse grained, non-plastic, angular to sub rounded, well graded, light grey, massive, dense.	
1.0	1089.0					**SILTY GRAVELLY SAND** (0.7 to 4.9) Silty gravelly SAND, fine to coarse grained, low plasticity, sub angular to sub rounded, well graded, dark greyish brown, massive, very dense, dry to moist. [Glacial Till]	
2.0	1088.0						
3.0	1087.0						
4.0	1086.0						
5.0	1085.0					End of Test Pit: 4.9 m Limit of excavator	

GENERAL REMARKS:
Pit walls stable, no groundwater, slow excavation due to dense material.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-177

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-178
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 26 Aug 14

Location: TSF Basin
Total Depth: 4.7 m
Date Completed: 26 Aug 14

Coordinates: 685,185 E , 5,606,611 N UTM NAD83 ZONE10
Elevation: 1106.1 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1106.0					**TOPSOIL/ORGANICS** (0 to 0.3) ORGANICS; root mat; and TOPSOIL; Sandy SILT; trace gravel, fine to coarse grained, non-plastic, sub angular to rounded; poorly graded, dark brown, massive, loose, dry to moist.	0 m - A: 0 - 0.3 m 0.3 m - C: 0.3 - 0.8 m
						SILTY SAND AND GRAVEL (0.3 to 0.8) Silty SAND and GRAVEL; trace cobbles; fine to coarse grained, non-plastic, angular to sub rounded, well graded, light grey, massive, dense, dry.	
1.0	1105.0					**GRAVELLY SAND** (0.8 to 4.7) Gravelly SAND; some silt; some cobbles; fine to coarse grained, non-plastic, angular to sub rounded, well graded, dark greyish-brown, massive, very dense, dry to moist. [Glacial Till]	
2.0	1104.0						
3.0	1103.0						
4.0	1102.0						
						End of Test Pit: 4.7 m Limit of excavator	
5.0	1101.0						

GENERAL REMARKS:
Pit walls stable, no groundwater, difficult to excavate after 1 m.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-178

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-179
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 26 Aug 14

Location: TSF Basin
Total Depth: 1.6 m
Date Completed: 26 Aug 14

Coordinates: 685,322 E , 5,606,644 N UTM NAD83 ZONE10
Elevation: 1092 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
						TOPSOIL/ORGANICS (0 to 0.4) ORGANICS; root mat; and TOPSOIL; Sandy SILT; trace gravel, fine to coarse grained, non-plastic, sub angular to rounded; poorly graded, dark brown, massive, loose, dry to moist.	0 m - A: 0 - 0.4 m 0.4 m - B: 0.4 - 0.5 m 0.5 m - C: 0.5 - 1.6 m
1.0	1091.0					**SILTY SAND** (0.4 to 1.6) Silty SAND; some gravel; trace cobbles, fine to coarse grained, non-plastic, angular to sub rounded, gap graded, medium brown, massive, dense, dry. [Colluvium]	
2.0	1090.0					**WEATHERED BEDROCK** (1.6) Light grey-green, massive, slightly weathered, strong, mafic volcanics ? End of Test Pit: 1.6 m Refusal on bedrock	
3.0	1089.0						
4.0	1088.0						
5.0	1087.0						

GENERAL REMARKS:
Pit walls sloughing due to loose sand and silt, no groundwater, difficult excavation in dry cobbly material.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-179

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-180
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 26 Aug 14

Location: TSF Basin
Total Depth: 4.7 m
Date Completed: 26 Aug 14

Coordinates: 685,506 E , 5,606,014 N UTM NAD83 ZONE10
Elevation: 1058.1 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1058.0					**TOPSOIL/ORGANICS** (0 to 0.3) ORGANICS; root mat; and TOPSOIL; Sandy SILT; trace gravel, fine to coarse grained, sub angular to rounded; poorly graded, non plastic, dark brown, massive, loose, dry.	0 m - A: 0 - 0.3 m 0.3 m - B: 0.3 - 0.6 m
						SILTY SAND (0.3 to 0.6) Silty SAND; some gravel; trace cobbles; fine to coarse grained, sub angular to sub rounded; poorly graded, non plastic, medium brown, compact, dry.	0.6 m - C: 0.6 - 1.1 m
1.0	1057.0					**SILTY SAND AND GRAVEL** (0.6 to 1.1) Silty SAND and GRAVEL, fine to coarse grained, angular to sub rounded; well graded, non plastic, light grey, very dense, dry.	
						SILTY GRAVELLY SAND (1.1 to 4.7) Silty gravelly SAND, fine to coarse grained, angular to sub rounded, well graded, low plasticity, dark greyish brown, massive, very dense, moist. [Glacial Till]	
2.0	1056.0						
3.0	1055.0						
4.0	1054.0	G B	TP14-180-1				
						End of Test Pit: 4.7 m Limit of excavator	
5.0	1053.0						

GENERAL REMARKS:
Pit walls stable, no groundwater, difficult to excavate after 1 m.

SAMPLING SYMBOLS:
G B GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-180

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-181
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 27 Aug 14

Location: TSF Basin
Total Depth: 5 m
Date Completed: 27 Aug 14

Coordinates: 685,227 E , 5,606,093 N UTM NAD83 ZONE10
Elevation: 1021.7 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1021.7					**TOPSOIL/ORGANICS** (0 to 0.3) ORGANICS; root mat; and TOPSOIL; Sandy SILT; trace gravel, fine to coarse grained, sub angular to rounded; poorly graded, non plastic, dark brown, loose, moist.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.3 m 0.3 m - C: 0.3 - 1.2 m
1.0	1021.0					**SILTY GRAVELLY SAND** (0.3 to 1.2) Silty gravelly SAND, fine to coarse grained; trace cobbles, fine to coarse grained, angular to sub rounded, well graded, non plastic, light grey, massive, very dense, dry.	
2.0	1020.0					**SILTY SAND** (1.2 to 5) Silty SAND; some gravel; trace cobbles; trace clay; fine to coarse grained, sub angular to sub rounded, well graded, low to medium plasticity, dark greyish brown, massive, very dense, moist. [Glacial Till]	
3.0	1019.0						
4.0	1018.0						
5.0	1017.0					End of Test Pit: 5 m Limit of excavator	
	1016.0						

GENERAL REMARKS:
Pit walls stable, no groundwater, difficult to excavate after 1 m.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-181

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-182
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 27 Aug 14

Location: TSF Basin
Total Depth: 4.8 m
Date Completed: 27 Aug 14

Coordinates: 684,739 E , 5,606,035 N UTM NAD83 ZONE10
Elevation: 986.8 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	986.8					**TOPSOIL/ORGANICS** (0 to 0.4) ORGANICS; root mat; and TOPSOIL; SILT; some sand; trace gravel, fine to coarse grained, sub angular to rounded; poorly graded, non plastic, medium to dark brown, loose to compact, moist.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.4 m
1.0	986.0					**SILTY SAND** (0.4 to 4.8) Silty SAND; some gravel; some cobbles; trace clay; fine to coarse grained, angular to sub rounded, well graded, low to medium plasticity, dark brownish grey, massive, very dense, moist. [Glacial Till]	
2.0	985.0						
3.0	984.0						
4.0	983.0						
5.0	982.0					End of Test Pit: 4.8 m Limit of excavator	
	981.0						

GENERAL REMARKS:
Pit walls sloughing slightly, no groundwater, difficult to excavate after 1 m due to dense material.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-182

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Contractor: Cobra Contracting Ltd.
Location: TSF Basin
Coordinates: 684,924 E , 5,606,111 N UTM NAD83 ZONE10

Test Pit No.: TP14-183
Equipment Used: CAT 320D L
Total Depth: 4.7 m
Elevation: 990.4 m

Page: 1 of 1
Date Started: 27 Aug 14
Date Completed: 27 Aug 14
Logged by: MAP
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	990.0					**TOPSOIL/ORGANICS** (0 to 0.4) ORGANICS; root mat; and TOPSOIL; SILT; some sand; trace gravel, fine to coarse grained, sub angular to rounded, poorly graded, non plastic, dark brown, loose, dry.	0 m - A: 0 - 0.4 m
						SILTY SAND (0.4 to 0.9) Silty SAND; some gravel; trace cobbles, fine to coarse grained, angular to rounded, poorly graded, non plastic, medium brown, massive, compact to dense, dry.	0.4 m - B: 0.4 - 0.9 m
1.0	989.0					**SILTY SAND AND GRAVEL** (0.9 to 1.1) Silty sandy GRAVEL; trace cobbles; fine to coarse grained, angular to sub rounded, well graded, non plastic, light grey, massive, dense, dry.	0.9 m - C: 0.9 - 1.1 m
						SILTY GRAVELLY SAND (1.1 to 4.7) Silty gravelly SAND; trace to some cobbles, fine to coarse grained, angular to sub rounded, well graded, low plasticity, dark greyish brown, massive, very dense, moist. [Glacial Till]	
2.0	988.0						
3.0	987.0						
4.0	986.0	G B	TP14-183-1			End of Test Pit: 4.7 m Limit of excavator	
5.0	985.0						

GENERAL REMARKS:
Pit walls stable, no groundwater, difficult to excavate due to dense material.

SAMPLING SYMBOLS:
G B GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-183

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-184
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 27 Aug 14

Location: TSF Basin
Total Depth: 4.7 m
Date Completed: 27 Aug 14

Coordinates: 684,838 E , 5,606,283 N UTM NAD83 ZONE10
Elevation: 982 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0						**TOPSOIL/ORGANICS** (0 to 0.4) ORGANICS; root mat; and TOPSOIL; Sandy SILT; trace gravel, fine to coarse grained, sub angular to rounded, poorly graded, non plastic, dark brown, loose, dry.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.4 m
						SILTY GRAVELLY SAND (0.4 to 4.7) Silty gravelly SAND; trace boulders; trace cobbles, fine to coarse grained, angular to sub rounded, well graded, low plasticity, massive, very dense, moist. [Glacial Till]	
1.0	981.0						
2.0	980.0						
3.0	979.0						
4.0	978.0						
4.7	977.3					End of Test Pit: 4.7 m Limit of excavator	
5.0	977.0						

GENERAL REMARKS:
Pit walls stable, no groundwater, difficult to excavate after 0.5 m.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-184

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-185
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 28 Aug 14

Location: TSF Basin
Total Depth: 4.8 m
Date Completed: 28 Aug 14

Coordinates: 684,929 E , 5,605,899 N UTM NAD83 ZONE10
Elevation: 1003.8 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1003.8					**TOPSOIL/ORGANICS** (0 to 0.3) ORGANICS; root mat; and TOPSOIL; SILT; some sand; trace gravel, fine to coarse grained, sub angular to rounded, poorly graded, non plastic, medium to dark brown, massive, loose to compact, dry to moist.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.3 m 0.3 m - C: 0.3 - 1.8 m
1.0	1003.0					**SILTY GRAVELLY SAND** (0.3 to 4.8) Silty gravelly SAND; fine to coarse grained, angular to sub rounded, poorly graded, non plastic, dark greyish brown, massive, dense to very dense, dry. [Glacial Till]	
2.0	1002.0						
3.0	1001.0						
4.0	1000.0						
4.8	999.0					End of Test Pit: 4.8 m Limit of excavator	
5.0	998.0						

GENERAL REMARKS:
Pit walls stable, no groundwater, difficult to excavate after 1 m.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-185

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-186
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 28 Aug 14

Location: TSF Basin
Total Depth: 4.6 m
Date Completed: 28 Aug 14

Coordinates: 685,069 E , 5,605,976 N UTM NAD83 ZONE10
Elevation: 1001.8 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1001.8					**TOPSOIL/ORGANICS** (0 to 0.7) ORGANICS; root mat; and TOPSOIL; Sandy SILT; trace gravel, fine to coarse grained, sub angular to rounded; poorly graded, non plastic, dark brown, loose, moist.	0 m - A: 0 - 0.3 m 0.3 m - B: 0.3 - 0.7 m 0.7 m - C: 0.7 - 1.3 m
1.0	1001.0					**SILTY SAND AND GRAVEL** (0.7 to 1.3) Silty SAND and GRAVEL, trace cobbles; fine to coarse grained, sub angular to sub rounded; well graded, non plastic, massive, very dense, dry.	
2.0	1000.0					**SILTY SAND** (1.3 to 4.6) Silty SAND; some gravel; trace cobbles; fine to coarse grained, angular to sub rounded; poorly graded, non plastic, medium brown, dense, dry to moist. [Glacial Till]	
3.0	999.0						
4.0	998.0						
5.0	997.0					End of Test Pit: 4.6 m Limit of excavator	
	996.0						

GENERAL REMARKS:
Pit walls stable, no groundwater, no excavation difficulties.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-186

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-187
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 28 Aug 14

Location: TSF Basin
Total Depth: 2.8 m
Date Completed: 28 Aug 14

Coordinates: 685,154 E , 5,605,878 N UTM NAD83 ZONE10
Elevation: 1014.6 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1014.6					**TOPSOIL/ORGANICS** (0 to 0.3) ORGANICS; root mat; and TOPSOIL; Sandy SILT; trace gravel, fine to coarse grained, sub angular to rounded; poorly graded, non plastic, dark brown, loose, moist.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.3 m
						SAND (0.3 to 2.8) SAND; some silt; some gravel; trace cobbles, fine to coarse grained, sub angular to rounded, poorly graded, non plastic, medium to light brown, massive, compact, dry. [Loess]	
1.0	1014.0						
2.0	1013.0						
	1012.0						
3.0						**WEATHERED BEDROCK** (2.8 to 2.8) dark grey, very strong, fresh. End of Test Pit: 2.8 m Refusal on weathered bedrock	
4.0	1011.0						
	1010.0						
5.0	1009.0						

GENERAL REMARKS:
Pit walls stable, no groundwater, bedrock outcrop around site.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-187

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Contractor: Cobra Contracting Ltd.
Location: TSF Basin
Coordinates: 685,335 E , 5,605,901 N UTM NAD83 ZONE10

Test Pit No.: TP14-188
Equipment Used: CAT 320D L
Total Depth: 4.4 m
Elevation: 1024.6 m

Page: 1 of 1
Date Started: 28 Aug 14
Date Completed: 28 Aug 14
Logged by: MAP
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1024.0					**TOPSOIL/ORGANICS** (0 to 1.1) ORGANICS; root mat; and TOPSOIL; SILT; some sand; trace gravel, fine to coarse grained, sub angular to rounded; poorly graded, non plastic, dark brown, massive, loose, moist.	0 m - A: 0 - 0.5 m
1.0	1023.0					**SILTY GRAVELLY SAND** (1.1 to 4.4) Silty gravelly SAND; trace cobbles; trace boulders; fine to coarse grained, angular to sub rounded, well graded, low plasticity, dark greyish brown, massive, very dense. [Glacial Till]	
2.0	1022.0						
3.0	1021.0						
4.0	1020.0	G B	TP14-188-1			End of Test Pit: 4.4 m Refusal on dense material	
5.0	1019.0						

GENERAL REMARKS:
Pit walls stable, no groundwater, excavation difficult after ~2 - 3 m.

SAMPLING SYMBOLS:
G B GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-188

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-189
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 28 Aug 14

Location: TSF Basin
Total Depth: 2.7 m
Date Completed: 28 Aug 14

Coordinates: 685,559 E , 5,605,828 N UTM NAD83 ZONE10
Elevation: 1051.4 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1051.0					**TOPSOIL/ORGANICS** (0 to 0.4) ORGANICS; root mat; and TOPSOIL; SILT; some sand; trace gravel, fine to coarse grained, sub angular to rounded; poorly graded, non plastic, dark brown, loose, moist.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.4 m 0.4 m - C: 0.4 - 0.6 m
						SAND AND GRAVEL (0.4 to 0.6) SAND; and GRAVEL; some silt, fine to coarse grained, angular to sub rounded, non plastic, light grey, massive, dense, dry.	
1.0	1050.0					**SILTY GRAVELLY SAND** (0.6 to 2.7) Silty gravelly SAND; trace cobbles; fine to coarse grained, angular to sub rounded, low plasticity, cohesive, massive, very dense, moist. [Glacial Till]	
2.0	1049.0						
3.0	1048.0					**WEATHERED BEDROCK** (2.7 to 2.7) completely rubblized by excavation, oxidization staining. End of Test Pit: 2.7 m Refusal on weathered bedrock	
4.0	1047.0						
5.0	1046.0						

GENERAL REMARKS:
Pit walls relatively stable, no groundwater, no excavation difficulties.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-189

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-190
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 29 Aug 14

Location: TSF Basin
Total Depth: 4.9 m
Date Completed: 29 Aug 14

Coordinates: 685,516 E , 5,605,631 N UTM NAD83 ZONE10
Elevation: 1054.3 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1054.0					**TOPSOIL/ORGANICS** (0 to 0.3) ORGANICS; root mat; and TOPSOIL; SILT; some sand; trace gravel, fine to medium grained, sub angular to rounded; poorly graded, non plastic, dark brown, loose, moist.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.3 m 0.3 m - C: 0.3 - 0.7 m
						SILTY GRAVELLY SAND (0.3 to 4.9) Silty gravelly SAND; trace cobbles; fine to coarse grained, angular to sub rounded, well graded, non plastic, light to dark greyish brown, massive, very dense, dry. [Glacial Till]	
1.0	1053.0						
2.0	1052.0						
3.0	1051.0						
4.0	1050.0						
4.9	1049.4					End of Test Pit: 4.9 m Limit of excavator	
5.0	1049.0						

GENERAL REMARKS:
Pit walls stable, no groundwater, no excavation difficulties.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-190

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-191
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 29 Aug 14

Location: TSF Basin
Total Depth: 5.4 m
Date Completed: 29 Aug 14

Coordinates: 685,553 E , 5,605,358 N UTM NAD83 ZONE10
Elevation: 1054 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0						**TOPSOIL/ORGANICS** (0 to 0.2) ORGANICS; root mat; and TOPSOIL; SILT; some sand; trace gravel, fine to coarse grained, sub angular to rounded; poorly graded, non plastic, dark brown, loose, moist.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 1 m
						SILT AND SAND (0.2 to 5.4) SILT; and SAND; trace cobbles; trace gravel; trace clay, fine to coarse grained, angular to sub rounded, poorly graded, non to highly plastic with depth, light brownish grey, massive, compact, moist. [Loess]	
1.0	1053.0						
2.0	1052.0						
3.0	1051.0						
4.0	1050.0						
5.0	1049.0	G B	TP14-191-1			End of Test Pit: 5.4 m Limit of excavator	

GENERAL REMARKS:
Pit walls stable, no groundwater, no excavation difficulties.

SAMPLING SYMBOLS:
G B GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-191

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-192
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 29 Aug 14

Location: TSF Basin
Total Depth: 4 m
Date Completed: 29 Aug 14

Coordinates: 685,409 E , 5,605,504 N UTM NAD83 ZONE10
Elevation: 1054.9 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0						**TOPSOIL/ORGANICS** (0 to 0.4) ORGANICS; root mat; and TOPSOIL; SILT; some sand; trace gravel, fine to coarse grained, sub angular to rounded; poorly graded, non plastic, dark brown, loose, moist.	0 m - A: 0 - 4 m
						SILTY SAND AND GRAVEL (0.4 to 4) Silty SAND and GRAVEL; trace cobbles, fine to coarse grained, angular to sub rounded, well graded, non plastic, cohesive, dark orangey brown, massive, dense, moist. [Glacial Till]	
1.0	1054.0						
2.0	1053.0						
3.0	1052.0						
4.0	1051.0					**WEATHERED BEDROCK** (4 to 4) dark grey, rubblized by excavation, very strong, oxidization staining. End of Test Pit: 4 m Refusal on weathered bedrock	
5.0	1050.0						
	1049.0						

GENERAL REMARKS:
Pit walls stable, no groundwater, no excavation difficulties.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-192

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-193
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 29 Aug 14

Location: TSF Basin
Total Depth: 3.1 m
Date Completed: 29 Aug 14

Coordinates: 685,395 E , 5,605,345 N UTM NAD83 ZONE10
Elevation: 1069.6 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1069.0					**TOPSOIL/ORGANICS** (0 to 0.7) ORGANICS; root mat; and TOPSOIL; SILT; some sand; trace gravel, fine to coarse grained, sub angular to rounded; poorly graded, non plastic, dark brown, loose, moist.	0 m - A: 0 - 0.3 m 0.3 m - B: 0.3 - 0.7 m
1.0	1068.0					**SILTY SAND** (0.7 to 3.1) Silty SAND; some gravel, trace cobbles, fine to coarse grained, angular to sub rounded, poorly graded, medium brown, massive, dense, moist. [Glacial Till]	
2.0	1067.0						
3.0	1066.0					**WEATHERED BEDROCK** (3.1 to 3.1) completely rubblized by excavation, oxidization staining. End of Test Pit: 3.1 m Refusal on bedrock	
4.0	1065.0						
5.0	1064.0						

GENERAL REMARKS:
Pit walls stable, no groundwater, excavation difficult after 1 m.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-193

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-194
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 29 Aug 14

Location: TSF Basin
Total Depth: 5 m
Date Completed: 29 Aug 14

Coordinates: 685,301 E , 5,605,642 N UTM NAD83 ZONE10
Elevation: 1034.9 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1034.9					**TOPSOIL/ORGANICS** (0 to 0.2) ORGANICS; root mat; and TOPSOIL; SILT; some sand; trace gravel, fine to coarse grained, sub angular to rounded; poorly graded, dark brown, loose, moist.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.5 m
						SILTY SAND AND GRAVEL (0.2 to 0.5) Silty SAND and GRAVEL; trace cobbles, fine to coarse grained, angular to sub rounded, well graded, non plastic, cohesive, light brown, massive, dense, dry.	
1.0	1034.0					**SILTY GRAVELLY SAND** (0.5 to 2) Silty gravelly SAND; trace cobbles; fine to coarse grained, angular to sub rounded, well graded, non plastic, cohesive, light greyish brown, massive, dense, dry to moist. [Glacial Till]	
2.0	1033.0						
3.0	1032.0						
4.0	1031.0						
5.0	1030.0					End of Test Pit: 5 m Limit of excavator	
	1029.0						

GENERAL REMARKS:
Pit walls stable, no groundwater, excavation difficult after 1 m.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-194

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-195
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 30 Aug 14

Location: TSF Basin
Total Depth: 2.3 m
Date Completed: 30 Aug 14

Coordinates: 685,218 E , 5,605,419 N UTM NAD83 ZONE10
Elevation: 1049.6 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1049.0					**TOPSOIL/ORGANICS** (0 to 0.6) ORGANICS; root mat; and TOPSOIL; SILT; some sand; trace gravel, fine to coarse grained, sub angular to rounded; poorly graded, dark brown, loose to compact, moist.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.6 m
1.0	1048.0					**SILTY SAND** (0.6 to 2.3) Silty SAND; some gravel; trace cobbles; trace boulders, fine to coarse grained, sub angular to rounded, well graded, light greyish brown, massive, very dense, dry. [Glacial Till]	
2.0	1047.0					End of Test Pit: 2.3 m Refusal on dense material	
3.0	1046.0						
4.0	1045.0						
5.0	1044.0						

GENERAL REMARKS:
Pit walls stable, no groundwater, excavation difficult due to very dense material.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-195

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Contractor: Cobra Contracting Ltd.
Location: TSF Basin
Coordinates: 685,218 E , 5,605,280 N UTM NAD83 ZONE10

Test Pit No.: TP14-196
Equipment Used: CAT 320D L
Total Depth: 4.6 m
Elevation: 1057.7 m

Page: 1 of 1
Date Started: 30 Aug 14
Date Completed: 30 Aug 14
Logged by: MAP
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1057.7					**TOPSOIL/ORGANICS** (0 to 0.3) ORGANICS; root mat; and TOPSOIL; Sandy SILT; trace gravel, fine to coarse grained, sub angular to rounded; poorly graded, non plastic, dark brown, loose, moist.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.3 m
1.0	1057.0					**SAND** (0.3 to 4.6) SAND; some gravel; some silt; trace cobbles; fine to coarse grained, sub angular to sub rounded, poorly graded, non plastic, cohesive, light greyish brown, massive, compact, dry. [Loess]	
2.0	1056.0						
3.0	1055.0						
4.0	1054.0						
5.0	1053.0					End of Test Pit: 4.6 m Limit of excavator	
	1052.0						

GENERAL REMARKS:
Pit walls sloughing slightly, no groundwater, no excavation difficulties.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-196

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Contractor: Cobra Contracting Ltd.
Location: TSF Basin
Coordinates: 685,379 E , 5,605,147 N UTM NAD83 ZONE10

Test Pit No.: TP14-197
Equipment Used: CAT 320D L
Total Depth: 1.4 m
Elevation: 1076 m

Page: 1 of 1
Date Started: 30 Aug 14
Date Completed: 30 Aug 14
Logged by: MAP
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0						**TOPSOIL/ORGANICS** (0 to 0.2) ORGANICS; root mat; and TOPSOIL; SILT; some sand; trace gravel, fine to coarse grained, sub angular to rounded; poorly graded, dark brown, massive, loose to compact, moist.	0 m - A: 0 - 0.2 m
1.0	1075.0					**SILTY SAND** (0.2 to 1.1) Silty SAND; trace cobbles; trace gravel; fine to coarse grained, sub angular to rounded, poorly graded, non plastic, cohesive, medium brown, massive, dense, dry to moist. [Colluvium]	
						WEATHERED BEDROCK (1.1 to 1.4) medium grey, strong, oxidization staining.	
						End of Test Pit: 1.4 m Refusal on weathered bedrock	
2.0	1074.0						
3.0	1073.0						
4.0	1072.0						
5.0	1071.0						

GENERAL REMARKS:
Pit walls sloughing slightly, no groundwater, difficult to excavate after 1 m due to dense material.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-197

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-198
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 30 Aug 14

Location: Southeast Embankment
Total Depth: 4.6 m
Date Completed: 30 Aug 14

Coordinates: 685,071 E , 5,605,333 N UTM NAD83 ZONE10
Elevation: 1032.6 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1032.6					**TOPSOIL/ORGANICS** (0 to 0.2) ORGANICS; root mat; and TOPSOIL; SILT; some sand; trace gravel, fine to coarse grained, sub angular to rounded; poorly graded, non plastic, dark brown, loose, moist.	0 m - A: 0 - 0.2 m
						SILTY SAND (0.2 to 4.6) Silty SAND; some gravel; trace cobbles, fine to coarse grained, angular to sub rounded, poorly graded, non plastic, cohesive, light greyish brown, stratified, compact to dense, dry to moist [Loess].	
1.0	1032.0						
2.0	1031.0						
3.0	1030.0						
4.0	1029.0						
	1028.0	G B	TP14-198-1			End of Test Pit: 4.6 m Limit of excavator	
5.0	1027.0						

GENERAL REMARKS:
Pit walls stable, no groundwater, excavation difficult after 1 m.

SAMPLING SYMBOLS:
G B GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-198

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-199
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 30 Aug 14

Location: Southeast Embankment
Total Depth: 2.2 m
Date Completed: 30 Aug 14

Coordinates: 685,060 E , 5,605,089 N UTM NAD83 ZONE10
Elevation: 1053.6 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1053.6					**TOPSOIL/ORGANICS** (0 to 0.3) ORGANICS; root mat; and TOPSOIL; SILT; some sand; trace gravel, fine to coarse grained, sub angular to rounded; poorly graded, non plastic, dark brown, massive, loose, moist.	0 m - A: 0 - 0.3 m 0.3 m - B: 0.3 - 0.4 m
	1053.0					**SILTY SAND** (0.3 to 0.4) Silty SAND; some gravel, fine to coarse grained, angular to sub rounded, poorly graded, medium brown, massive, compact, moist. [Loess]	
1.0						**GRAVELLY SAND** (0.4 to 2.2) Gravelly SAND; some silt; trace cobbles, fine to coarse grained, angular to sub rounded, well graded, non plastic, cohesive, massive, very dense, moist. [Glacial Till]	
	1052.0						
2.0						End of Test Pit: 2.2 m Refusal on dense material	
	1051.0						
3.0							
	1050.0						
4.0							
	1049.0						
5.0							
	1048.0						

GENERAL REMARKS:
Pit walls stable, no groundwater, excavation difficult after 1 m.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-199

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-200
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 1 Sep 14

Location: Southeast Embankment
Total Depth: 4.6 m
Date Completed: 1 Sep 14

Coordinates: 684,804 E , 5,605,232 N UTM NAD83 ZONE10
Elevation: 1060.1 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1060.0					**TOPSOIL/ORGANICS** (0 to 0.3) ORGANICS; root mat; and TOPSOIL; SILT; some sand; trace gravel, fine to coarse grained, sub angular to rounded; poorly graded, non plastic, dark brown, loose, moist.	0 m - A: 0 - 0.3 m
						SILTY SAND (0.3 to 4.6) Silty SAND; some gravel; trace cobbles, fine to coarse grained, angular to sub rounded, gap graded, non to low plasticity, light to dark greyish brown, massive, compact to dense, dry to moist. [Glacial Till]	
1.0	1059.0						
2.0	1058.0						
3.0	1057.0						
4.0	1056.0						
						End of Test Pit: 4.6 m Limit of excavator	
5.0	1055.0						

GENERAL REMARKS:
Pit walls stable, no groundwater, excavation difficult after 2 m.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-200

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-201
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 1 Sep 14

Location: TSF Basin
Total Depth: 4.5 m
Date Completed: 1 Sep 14

Coordinates: 684,728 E , 5,605,141 N UTM NAD83 ZONE10
Elevation: 1078.7 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1078.7					**TOPSOIL/ORGANICS** (0 to 0.2) ORGANICS; root mat; and TOPSOIL; SILT; some sand; trace gravel, fine to coarse grained, sub angular to rounded; poorly graded, non plastic, dark brown, loose, moist.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.5 m
						SILTY SAND (0.2 to 0.5) Silty SAND; trace gravel; fine to coarse grained, sub angular to rounded, poorly graded, non plastic, medium brown, massive, dense, dry. [Loess]	
1.0	1078.0					**SILTY SAND AND GRAVEL** (0.5 to 4.5) Silty SAND; and GRAVEL; trace cobbles; fine to coarse grained, angular to sub rounded, well graded, non to low plasticity, cohesive, light to dark greyish brown, massive, dense, dry to moist. [Glacial Till]	
2.0	1077.0						
3.0	1076.0						
4.0	1075.0	G B	TP14-201-1				
	1074.0					End of Test Pit: 4.5 m Limit of excavator	
5.0	1073.0						

GENERAL REMARKS:
Pit walls stable, no groundwater, excavation difficult after 2 m.

SAMPLING SYMBOLS:
G B GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-201

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-202
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 1 Sep 14

Location: TSF Basin
Total Depth: 4.5 m
Date Completed: 1 Sep 14

Coordinates: 684,549 E , 5,605,260 N UTM NAD83 ZONE10
Elevation: 1078.8 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1078.8					**TOPSOIL/ORGANICS** (0 to 0.2) ORGANICS; root mat; and TOPSOIL; SILT; some sand; trace gravel; fine grained, non-plastic, sub angular to rounded, poorly graded, dark brown, massive, loose, moist.	0 m - A: 0 - 0.2 m 0.2 m - C: 0.2 - 0.4 m
						SILTY GRAVELLY SAND (0.2 to 0.4) Silty gravelly SAND; fine to coarse grained; non-plastic, angular to sub rounded; well graded, light grey, massive, moderately dense to dense, dry.	
1.0	1078.0					**SILTY GRAVELLY SAND** (0.4 to 4.5) Silty gravelly SAND; fine to coarse grained; low plasticity, angular to sub rounded; well graded, dark greyish-brown, massive, very dense, moist. [Glacial Till]	
2.0	1077.0						
3.0	1076.0						
4.0	1075.0						
4.5	1074.3					End of Test Pit: 4.5 m Limit of excavator	
5.0	1074.0						
	1073.0						

GENERAL REMARKS:
Pit walls stable, no groundwater, excavation difficult after 2 m.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-202

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-203
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 1 Sep 14

Location: TSF Basin
Total Depth: 3.7 m
Date Completed: 1 Sep 14

Coordinates: 684,494 E , 5,605,619 N UTM NAD83 ZONE10
Elevation: 1043 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
						TOPSOIL/ORGANICS (0 to 0.2) ORGANICS; root mat; and TOPSOIL; SILT; some sand; trace gravel; fine grained, non-plastic, sub angular to rounded, poorly graded, dark brown, massive, loose, moist.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.5 m
						SANDY SILT (0.2 to 0.5) Sandy SILT; trace gravel; fine grained, non-plastic, sub angular to rounded, poorly graded, medium brown, massive, moderately dense, moist. [Loess]	0.5 m - C: 0.5 - 1.0 m
1.0	1042.0					**SILTY GRAVELLY SAND** (0.5 to 1) Silty gravelly SAND; trace cobbles; fine to coarse grained; non-plastic, angular to sub rounded; well graded, light to medium greyish-brown, massive, moderately dense to dense, dry.	
						SILTY GRAVELLY SAND (1 to 3.7) Silty gravelly SAND; trace cobbles; fine to coarse grained; low plasticity, angular to sub rounded; well graded, dark greyish-brown, massive, very dense, moist. [Glacial Till]	
2.0	1041.0						
3.0	1040.0						
4.0	1039.0					End of Test Pit: 3.7 m Refusal on dense material	
5.0	1038.0						

GENERAL REMARKS:
Pit walls stable, no groundwater, excavation difficult after 2.5 m.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-203

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-204
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 1 Sep 14

Location: TSF Basin
Total Depth: 4.2 m
Date Completed: 1 Sep 14

Coordinates: 684,652 E , 5,605,437 N UTM NAD83 ZONE10
Elevation: 1051.4 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1051.0					**TOPSOIL/ORGANICS** (0 to 0.1) ORGANICS; root mat; and TOPSOIL; SILT; some sand; trace gravel; fine grained, non-plastic, sub angular to rounded, poorly graded, dark brown, massive, loose, moist.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.8 m
						SILT (0.1 to 0.8) SILT; some sand; trace gravel; fine grained, non-plastic, sub angular to rounded, poorly graded, medium greyish-brown, massive, dense, dry. [Loess]	
1.0	1050.0					**SILTY SAND** (0.8 to 4.2) Silty SAND; trace gravel; fine grained; non-plastic, sub angular to rounded; poorly graded, light brownish-grey, massive, very dense. Cohesive/blocky material. [Glacial Till]	
2.0	1049.0						
3.0	1048.0						
4.0	1047.0					End of Test Pit: 4.2 m Limit of excavator	
5.0	1046.0						

GENERAL REMARKS:
Pit walls stable, no groundwater, excavation difficult after 2 m.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-204

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-205
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 1 Sep 14

Location: TSF Basin
Total Depth: 3.8 m
Date Completed: 1 Sep 14

Coordinates: 684,865 E , 5,605,309 N UTM NAD83 ZONE10
Elevation: 1046.2 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1046.0					**TOPSOIL/ORGANICS** (0 to 0.3) ORGANICS; root mat; and TOPSOIL; SILT; some sand; trace gravel; fine grained, non-plastic, sub angular to rounded, poorly graded, dark brown, massive, loose, moist.	0 m - A: 0 - 0.3 m
						SILTY GRAVELLY SAND (0.3 to 1) Silty gravelly SAND; trace cobbles; fine to coarse grained; non-plastic, angular to sub rounded; well graded, medium greyish-brown, massive, dense, dry.	
1.0	1045.0					**SILTY GRAVELLY SAND** (1 to 3.8) Silty gravelly SAND; trace cobbles; fine to coarse grained; low plasticity, angular to sub rounded; well graded, dark greyish-brown, massive, very dense, moist. [Glacial Till]	
2.0	1044.0						
3.0	1043.0	G B	TP14-205-1				
4.0	1042.0					End of Test Pit: 3.8 m Limit of excavator	
5.0	1041.0						

GENERAL REMARKS:
Pit walls stable, no groundwater, no excavation difficulties.

SAMPLING SYMBOLS:
G B GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-205

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Contractor: Cobra Contracting Ltd.
Location: TSF Basin
Coordinates: 684,832 E , 5,605,548 N UTM NAD83 ZONE10

Test Pit No.: TP14-206
Equipment Used: CAT 320D L
Total Depth: 4.1 m
Elevation: 1024.6 m

Page: 1 of 1
Date Started: 2 Sep 14
Date Completed: 2 Sep 14
Logged by: MAP
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1024.6					**TOPSOIL/ORGANICS** (0 to 0.3) ORGANICS; root mat; and TOPSOIL; SILT; some sand; trace gravel; fine grained, non-plastic, sub angular to rounded, poorly graded, dark brown, massive, loose, moist.	0 m - A: 0 - 0.3 m
	1024.0					**SILT** (0.3 to 1) SILT; some sand; trace gravel; fine grained; sub angular to sub rounded, poorly graded, medium brown, massive, loose to moderately dense, dry. [Loess]	
1.0						**SAND** (1 to 4.1) SAND; some silt; trace gravel; trace cobbles; fine to coarse grained, non-plastic, sub angular to rounded, poorly graded, light to medium grey, massive, dense. [Loess]	
	1023.0						
2.0							
	1022.0						
3.0							
	1021.0						
4.0		G B	TP14-206-1			End of Test Pit: 4.1 m Limit of excavator	
	1020.0						
5.0							
	1019.0						

GENERAL REMARKS:
Pit walls stable, no groundwater, no excavation difficulties.

SAMPLING SYMBOLS:
G B GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-206

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-207
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 2 Sep 14

Location: TSF Basin
Total Depth: 4.5 m
Date Completed: 2 Sep 14

Coordinates: 684,809 E , 5,605,826 N UTM NAD83 ZONE10
Elevation: 1010.3 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1010.0					**TOPSOIL/ORGANICS** (0 to 0.2) ORGANICS; root mat; and TOPSOIL; SILT; some sand; trace gravel; fine grained, non-plastic, sub angular to rounded, poorly graded, dark brown, massive, moderately dense, moist.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.6 m
1.0	1009.0					**SILT** (0.2 to 0.6) SILT; some sand; trace gravel; fine grained; sub angular to sub rounded, poorly graded, medium brown, massive, loose to moderately dense, dry. [Loess] **SILTY SAND AND GRAVEL** (0.6 to 0.9) Silty SAND and GRAVEL; fine to coarse grained; non-plastic, angular to sub rounded; well graded, light grey, massive, dense, dry. **SILTY GRAVELLY SAND** (0.9 to 4.5) Silty gravelly SAND; some cobbles; fine to coarse grained; angular to sub rounded; well graded, dark greyish-brown, massive, very dense, moist.[Glacial Till]	0.6 m - C: 0.6 - 0.9 m
2.0	1008.0						
3.0	1007.0						
4.0	1006.0	G B	TP14-207-1			End of Test Pit: 4.5 m Limit of excavator	
5.0	1005.0						

GENERAL REMARKS:
Pit walls stable, no groundwater, no excavation difficulties.

SAMPLING SYMBOLS:
G B GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-207

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-208
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 2 Sep 14

Location: SMRSF
Total Depth: 4 m
Date Completed: 2 Sep 14

Coordinates: 685,102 E , 5,608,050 N UTM NAD83 ZONE10
Elevation: 980.9 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	980.0					**TOPSOIL/ORGANICS** (0 to 0.1) ORGANICS; root mat; and TOPSOIL; SILT; some sand; trace gravel; fine grained, non-plastic, sub angular to rounded, poorly graded, dark brown, massive, loose, moist.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.3 m 0.3 m - C: 0.3 - 0.5 m
						SILT (0.1 to 0.3) SILT; some sand; trace gravel; fine grained; sub angular to sub rounded, poorly graded, medium brown, massive, loose to moderately dense, dry. [Loess]	
1.0						**SILTY SAND AND GRAVEL** (0.3 to 0.5) Silty SAND and GRAVEL; trace cobbles; fine to coarse grained; non-plastic, angular to sub rounded; well graded, massive, dry.	
						SILTY SAND (0.5 to 4) Silty SAND; some gravel; some cobbles; fine to coarse grained; low plasticity, angular to rounded; well graded, medium to dark brown, massive, very dense, moist. [Glacial Till]	
2.0	979.0						
3.0	978.0						
4.0	977.0					End of Test Pit: 4 m Limit of excavator	
5.0	976.0						
	975.0						

GENERAL REMARKS:
Pit walls stable, no groundwater, excavation difficult after 1 m.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-208

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-209
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 3 Sep 14

Location: SMRSF
Total Depth: 0.9 m
Date Completed: 3 Sep 14

Coordinates: 685,069 E , 5,608,223 N UTM NAD83 ZONE10
Elevation: 1001.3 m
Logged by: JAG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1001.0					**TOPSOIL/ORGANICS** (0 to 0.1) ORGANICS; root mat; and TOPSOIL; SILT; some sand; trace gravel; fine grained, non-plastic, sub angular to sub rounded, poorly graded, dark brown, massive, loose, moist.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.8 m
						SANDY SILT (0.1 to 0.8) Sandy SILT; some gravel; trace cobbles; fine to coarse grained; non-plastic, angular to sub rounded; well graded, light to medium reddish-brown, massive, moderately dense, dry. [Colluvium]	
1.0	1000.0					**WEATHERED BEDROCK** (0.8 to 0.9) Light grey-green, massive, slightly weathered, strong, mafic volcanics ?	
						End of Test Pit: 0.9 m Refusal on weathered bedrock	
2.0	999.0						
3.0	998.0						
4.0	997.0						
5.0	996.0						

GENERAL REMARKS:
Pit walls stable, no groundwater, no excavation difficulties.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-209

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Contractor: Cobra Contracting Ltd.
Location: SMRSF Access Road
Coordinates: 685,021 E , 5,608,413 N UTM NAD83 ZONE10

Test Pit No.: TP14-210
Equipment Used: CAT 320D L
Total Depth: 0.6 m
Elevation: 983.6 m

Page: 1 of 1
Date Started: 3 Sep 14
Date Completed: 3 Sep 14
Logged by: JAG
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	983.6					**TOPSOIL/ORGANICS** (0 to 0.1) ORGANICS; root mat; and TOPSOIL; SILT; some sand; trace gravel; fine grained, non-plastic, sub angular to sub rounded, poorly graded, dark brown, massive, loose, moist.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.5 m
						SANDY SILT (0.1 to 0.5) Sandy SILT; some gravel; fine to coarse grained; non-plastic, angular to sub rounded; well graded, light to medium brown, massive, moderately dense, dry. [Colluvium]	
1.0	983.0					**WEATHERED BEDROCK** (0.5 to 0.6) Light grey-green, massive, slightly weathered, strong, mafic volcanics ?	
						End of Test Pit: 0.6 m Refusal on weathered bedrock	
2.0	982.0						
3.0	981.0						
4.0	980.0						
5.0	979.0						
	978.0						

GENERAL REMARKS:
No groundwater, difficult excavation due to shallow bedrock, bedrock outcrop surrounding site.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-210

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-211
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 3 Sep 14

Location: Overland Conveyor
Total Depth: 5.3 m
Date Completed: 3 Sep 14

Coordinates: 685,170 E , 5,608,749 N UTM NAD83 ZONE10
Elevation: 900.9 m
Logged by: JAG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
						TOPSOIL/ORGANICS (0 to 0.3) ORGANICS; root mat; and TOPSOIL; SILT; some sand; trace gravel; fine grained, non-plastic, sub angular to sub rounded, poorly graded, dark brown, massive, loose to moderately dense, moist.	0 m - A: 0 - 0.3 m 0.3 m - B: 0.3 - 0.5 m
						SILT (0.3 to 0.8) SILT; some sand; trace gravel; fine grained, non-plastic, sub angular to sub rounded, poorly graded, light brown, massive, moderately dense, dry. [Loess]	
1.0	900.0					**SILTY SAND** (0.8 to 5.3) Silty SAND; some gravel; trace cobbles; trace boulders; fine to coarse grained; low plasticity, sub angular to sub rounded; well graded, medium brown, massive, moderately dense to dense, dry to moist at 2.5 m. [Glaciofluvial]	
2.0	899.0						
3.0	898.0						
4.0	897.0						
5.0	896.0	GB	TP14-211-1				
	895.0					**WEATHERED BEDROCK** (5.3) Light grey-green, massive, slightly weathered, strong, mafic volcanics ? End of Test Pit: 5.3 m Limit of excavator	

GENERAL REMARKS:
Pit walls stable, no groundwater, excavation difficult due to boulders.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-211

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-212
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 3 Sep 14

Location: Overland Conveyor
Total Depth: 3.6 m
Date Completed: 3 Sep 14

Coordinates: 685,386 E , 5,608,826 N UTM NAD83 ZONE10
Elevation: 929.3 m
Logged by: JAG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	929.0					**TOPSOIL/ORGANICS** (0 to 0.15) ORGANICS; root mat; and TOPSOIL; SILT; some sand; trace gravel; fine grained, non-plastic, sub angular to sub rounded, poorly graded, dark brown, massive, loose, moist.	0 m - A: 0 - 0.15 m 0.15 m - B: 0.15 - 0.45 m
						SILT (0.15 to 0.45) SILT; some sand; trace gravel; fine grained, non-plastic, sub angular to sub rounded, poorly graded, light brown, massive, moderately dense, dry. [Loess]	0.45 m - C: 0.45 - 0.8 m
1.0						**SILTY SAND** (0.45 to 0.8) Silty SAND; some gravel; trace cobbles; fine to coarse grained; sub angular to sub rounded; well graded, light white-brown, massive, moderately dense, dry.	
	928.0					**SANDY SILT** (0.8 to 3.6) Sandy SILT; some gravel; trace cobbles; fine to coarse grained; sub angular to sub rounded; well graded, medium brown, massive, dense, moist. [Glacial Till]	
2.0	927.0						
3.0	926.0						
3.6						End of Test Pit: 3.6 m Refusal on dense material	
4.0	925.0						
5.0	924.0						

GENERAL REMARKS:
Pit walls stable, no groundwater, excavation difficult after 3.4 m.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-212

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-213
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 3 Sep 14

Location: Haul / Access Roads
Total Depth: 2.5 m
Date Completed: 3 Sep 14

Coordinates: 685,505 E , 5,609,015 N UTM NAD83 ZONE10
Elevation: 905.9 m
Logged by: JAG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	905.0					**TOPSOIL/ORGANICS** (0 to 0.2) ORGANICS; root mat; and TOPSOIL; SILT; some sand; trace gravel; trace cobbles; fine to coarse grained, sub angular to sub rounded, gap graded, dark brown, massive, loose, moist.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.4 m 0.4 m - C: 0.4 - 0.8 m
						SILT (0.2 to 0.4) SILT; some sand; trace gravel; trace cobbles; fine to coarse grained, sub angular to sub rounded, gap graded, medium brown, massive, moderately dense, dry. [Loess]	
1.0						**SILTY GRAVELLY SAND** (0.4 to 0.8) Silty gravelly SAND; trace cobbles; fine to coarse grained; sub angular to sub rounded; well graded, light greyish-brown, massive, moderately dense, dry to moist.	
	904.0					**SANDY GRAVEL** (0.8 to 2.5) Sandy GRAVEL; some silt; some cobbles; fine to coarse grained, sub angular to rounded, well graded, medium greyish-brown, massive, moderately dense to dense, moist. [Glaciofluvial]	
2.0		G B	TP14-213-1				
	903.0					End of Test Pit: 2.5 m Refusal on possible bedrock	
3.0							
	902.0						
4.0							
	901.0						
5.0							
	900.0						

GENERAL REMARKS:
Pit walls sloughing in, no groundwater, no excavation difficulties.

SAMPLING SYMBOLS:
G B GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-213

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-214
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 4 Sep 14

Location: Haul / Access Roads
Total Depth: 1.3 m
Date Completed: 4 Sep 14

Coordinates: 685,595 E , 5,609,127 N UTM NAD83 ZONE10
Elevation: 900.6 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	900.0					**TOPSOIL/ORGANICS** (0 to 0.2) ORGANICS; root mat; and TOPSOIL; SILT; some sand; trace gravel; fine grained; non-plastic, sub angular to rounded, poorly graded, dark brown, massive, loose.	0 m - A: 0 - 0.2 m 0.2 m - C: 0.2 - 0.7 m
						SAND (0.2 to 0.7) SAND; some gravel; some cobbles; some silt; fine to coarse grained; non-plastic, sub angular to rounded; gap graded, light greyish-brown, massive, moderately dense, dry.	
1.0	899.0					**SANDY GRAVEL** (0.7 to 1.3) Sandy GRAVEL; some silt; some cobbles; fine to coarse grained, non-plastic, angular to rounded, well graded, medium greyish-brown, massive, moderately dense, moist. [Glaciofluvial]	
2.0	898.0					End of Test Pit: 1.3 m Refusal on weathered bedrock	
3.0	897.0						
4.0	896.0						
5.0	895.0						

GENERAL REMARKS:
Pit walls sloughing in, no groundwater, no excavation difficulties.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-214

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-215
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 4 Sep 14

Location: Haul / Access Roads
Total Depth: 3.8 m
Date Completed: 4 Sep 14

Coordinates: 685,684 E , 5,609,225 N UTM NAD83 ZONE10
Elevation: 886.4 m
Logged by: JAG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	886.0					**TOPSOIL/ORGANICS** (0 to 0.05) ORGANICS; root mat; and TOPSOIL; SILT; some sand; trace gravel; fine grained; poorly graded, dark brown, massive, loose, moist.	0 m - A: 0 - 0.05 m
						SANDY SILT (0.05 to 0.3) Sandy SILT; some gravel; fine to coarse grained; sub angular to rounded; well graded, dark brown, massive, moderately dense, dry. [Loess]	
1.0	885.0					**SANDY GRAVEL** (0.3 to 1.7) Sandy GRAVEL; some silt; some cobbles; fine to coarse grained, sub angular to rounded, well graded, medium brown, massive, dense, moist. Grading to more coarse material with depth. [Glaciofluvial]	
2.0	884.0					**SANDY SILT** (1.7 to 3.8) Sandy SILT; some gravel; trace cobbles; fine to coarse grained; sub angular to sub rounded, well graded, medium brown, massive, dense, moist. [Glacial Till]	
3.0	883.0						
4.0	882.0					End of Test Pit: 3.8 m Wall instability / Dense Material	
5.0	881.0						

GENERAL REMARKS:
Pit walls sloughing near surface, no groundwater, no excavation difficulties.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-215

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-216
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 324
Date Started: 4 Sep 14

Location: Old Mine Rock Facility / Ore Stockpile
Total Depth: 3.5 m
Date Completed: 4 Sep 14

Coordinates: 684,582 E , 5,608,823 N UTM NAD83 ZONE10
Elevation: 933.5 m
Logged by: JAG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	933.0					**TOPSOIL/ORGANICS** (0 to 0.3) ORGANICS; root mat; and TOPSOIL; Sandy SILT; some gravel; fine to coarse grained; sub angular to sub rounded; poorly graded, medium brown, massive, moderately dense, moist.	0 m - Old Mine Rock Stockpile
						SANDY SILT (0.3 to 0.6) Sandy SILT; some gravel; fine to coarse grained; sub angular to sub rounded; poorly graded, medium brown, massive, moderately dense, dry.	
1.0	932.0					**SANDY COBBLY GRAVEL** (0.6 to 3.5) Sandy; COBBLY; GRAVEL; some silt; trace boulders; fine to coarse grained; angular to sub angular; well graded; light to medium brownish-grey, massive, dense, dry to moist. General gradation towards larger material with depth. [Mine Rock]	
2.0	931.0						
3.0	930.0					End of Test Pit: 3.5 m Wall instability	
4.0	929.0						
5.0	928.0						

GENERAL REMARKS:
Pit walls sloughing in below 0.6 m, no groundwater, excavation difficult due to dense material and boulders.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-216

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-217
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 324
Date Started: 4 Sep 14

Location: Old Mine Rock Facility / Ore Stockpile
Total Depth: 3.4 m
Date Completed: 4 Sep 14

Coordinates: 684,384 E , 5,608,794 N UTM NAD83 ZONE10
Elevation: 934.4 m
Logged by: JAG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	934.0					**TOPSOIL/ORGANICS** (0 to 0.4) ORGANICS; root mat; and TOPSOIL; Sandy SILT; some gravel; fine to coarse grained; sub angular to sub rounded; poorly graded, medium brown, massive, loose, moist.	0 m - Old Mine Rock Stockpile
						SANDY SILT (0.4 to 0.8) Sandy SILT; some gravel; trace cobbles; fine to coarse grained; sub angular to sub rounded; poorly graded, medium brown, massive, moderately dense, dry.	
1.0	933.0					**SANDY COBBLY GRAVEL** (0.8 to 3.4) Sandy; COBBLY; GRAVEL; some silt; trace boulders; fine to coarse grained; angular to sub angular; well graded; light brownish-grey, massive, dense, dry to moist. General gradation towards larger material with depth. [Mine Rock]	
2.0	932.0						
3.0	931.0					End of Test Pit: 3.4 m Wall instability	
4.0	930.0						
5.0	929.0						

GENERAL REMARKS:
Pit walls sloughing in below 0.8 m, no groundwater, excavation difficult due to dense material and boulders.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-217

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-218
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 324
Date Started: 5 Sep 14

Location: Old Mine Rock Facility / Ore Stockpile
Total Depth: 0.25 m
Date Completed: 5 Sep 14

Coordinates: 684,779 E , 5,608,826 N UTM NAD83 ZONE10
Elevation: 925 m
Logged by: JAG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	925.0					**TOPSOIL/ORGANICS** (0 to 0.2) ORGANICS; root mat; and TOPSOIL; Sandy SILT; trace gravel; fine grained; poorly graded, dark brown, massive, loose, moist.	0 m - Old Mine Rock Stockpile
						WEATHERED BEDROCK (0.2 to 0.25) Light grey-green, massive, slightly weathered, strong, mafic volcanics ?	
						End of Test Pit: 0.25 m Refusal on weathered bedrock	
1.0	924.0						
2.0	923.0						
3.0	922.0						
4.0	921.0						
5.0	920.0						

GENERAL REMARKS:
No groundwater, no excavation difficulties.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-218

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, TEST PIT LOG, 2014 KP DATA TEMPLATE REVB.GDT, 17-Mar-15

Project: AJAX PROJECT
Test Pit No.: TP14-219
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 5 Sep 14

Location: Old Mine Rock Facility / Ore Stockpile
Total Depth: 2.3 m
Date Completed: 5 Sep 14

Coordinates: 684,306 E , 5,608,451 N UTM NAD83 ZONE10
Elevation: 936.8 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	936.8					**TOPSOIL/ORGANICS** (0 to 0.2) ORGANICS; root mat; and TOPSOIL; SILT and SAND; some gravel; trace cobbles; fine grained; non-plastic, poorly graded, dark brown, massive, loose, moist.	0 m - Old Mine Rock Stockpile
						SANDY GRAVEL (0.2 to 0.4) Sandy GRAVEL; some cobbles; fine to coarse grained, non-plastic, angular, well graded, light grey and dark brown, massive, moderately dense, moist.	
1.0	936.0					**COBBLES AND BOULDERS** (0.4 to 2.3) COBBLES and BOULDERS; some gravel; some sand; angular, gap graded, light grey, loose, dry. [Mine Rock]	
2.0	935.0						
3.0	934.0						
4.0	933.0						
5.0	932.0						
	931.0					End of Test Pit: 2.3 m Wall instability	

GENERAL REMARKS:
Pit walls unstable, no groundwater, difficult excavation due to boulders.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-219

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, TEST PIT LOG, 2014 KP DATA TEMPLATE REVB.GDT, 17-Mar-15

Project: AJAX PROJECT
Test Pit No.: TP14-220
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 324
Date Started: 5 Sep 14

Location: Central Collection Pond
Total Depth: 4.6 m
Date Completed: 5 Sep 14

Coordinates: 684,985 E , 5,608,831 N UTM NAD83 ZONE10
Elevation: 912 m
Logged by: JAG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
						TOPSOIL/ORGANICS (0 to 0.25) ORGANICS; root mat; and TOPSOIL; Sandy SILT; trace gravel; fine grained; poorly graded, dark brown, massive, loose, moist.	0 m - A: 0 - 0 25 m 0.25 m - B: 0.25 - 0.6 m
						SILT (0.25 to 0.6) SILT; some sand; trace gravel; fine grained; sub angular to sub rounded, poorly graded, medium brown, massive, loose to moderately dense, dry. [Loess]	0.6 m - C: 0.6 - 0.8 m
1.0	911.0					**GRAVELLY SAND** (0.6 to 0.8) Gravelly SAND; some silt; trace cobbles; fine to coarse grained; sub angular to sub rounded, well graded, light white-brown, massive, moderately dense, dry.	
						SILTY SAND (0.8 to 4.6) Silty SAND; some gravel; trace cobbles; fine to coarse grained; sub angular to sub rounded; well graded, medium brown, massive, dense, dry to moist. [Glacial Till]	
2.0	910.0						
3.0	909.0						
4.0	908.0	G B	TP14-220-1			End of Test Pit: 4.6 m Limit of excavator	
5.0	907.0						

GENERAL REMARKS:
Pit walls stable, no groundwater, no excavation difficulties.

SAMPLING SYMBOLS:
G B GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-220

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-221
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 5 Sep 14

Location: Old Mine Rock Facility / Ore Stockpile
Total Depth: 3 m
Date Completed: 5 Sep 14

Coordinates: 684,494 E , 5,608,453 N UTM NAD83 ZONE10
Elevation: 933.6 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	933.0					**GRAVELLY SAND** (0 to 0.2) Gravelly SAND; some silt; trace cobbles; fine to coarse grained; non-plastic, angular to sub angular, well graded, dark brownish-grey, massive.. **GRAVELLY COBBLES** (0.2 to 3) Gravelly; COBBLES; some boulders; trace sand; coarse grained, angular, light grey, massive, loose, dry. [Mine Rock]	0 m - Old Mine Rock Stockpile
1.0	932.0	G B	TP14-221-1				
2.0	931.0						
3.0	930.0					End of Test Pit: 3 m Wall instability	
4.0	929.0						
5.0	928.0						

GENERAL REMARKS:
Pit walls sloughing, no groundwater, no excavation difficulties.

SAMPLING SYMBOLS:
G B GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-221

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-222
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 324
Date Started: 5 Sep 14

Location: Overland Conveyor
Total Depth: 4.1 m
Date Completed: 5 Sep 14

Coordinates: 685,176 E , 5,608,888 N UTM NAD83 ZONE10
Elevation: 891 m
Logged by: JAG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
						TOPSOIL/ORGANICS (0 to 0.15) ORGANICS; root mat; and TOPSOIL; Sandy SILT; trace gravel; fine grained; poorly graded, dark brown, massive, loose, moist.	0 m - A: 0 - 0.15 m 0.15 m - B: 0.15 - 0.6 m
						SILTY SAND (0.15 to 0.6) Silty SAND; some gravel; fine to coarse grained; sub angular to sub rounded; well graded, medium brown, massive, moderately dense, dry. [Loess]	0.6 m - C: 0.6 - 1.1 m
1.0	890.0					**GRAVELLY SAND** (0.6 to 1.1) Gravelly SAND; some silt; some cobbles; fine to coarse grained; sub angular to sub rounded, well graded, light yellowish-brownish-grey, massive, moderately dense, dry.	
						SANDY GRAVEL (1.1 to 4.1) Sandy GRAVEL; some silt; some cobbles, rounded; fine to coarse grained, sub angular to rounded, well graded, medium brown, massive, dense, dry to moist at 2.4 m. [Glacial Till]	
2.0	889.0						
3.0	888.0						
4.0	887.0					End of Test Pit: 4.1 m Limit of excavator	
5.0	886.0						

GENERAL REMARKS:
Pit walls stable, no groundwater, no excavation difficulties.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-222

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-223
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 5 Sep 14

Location: Old Mine Rock Facility / Ore Stockpile
Total Depth: 3 m
Date Completed: 5 Sep 14

Coordinates: 684,204 E , 5,608,650 N UTM NAD83 ZONE10
Elevation: 934.9 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	934.9					**GRAVELLY SAND** (0 to 0.3) Gravelly SAND; some cobbles; trace silt; fine to coarse grained; non-plastic, angular to sub angular, well graded, dark brownish-grey, massive, loose to moderately dense, moist.	0 m - Old Mine Rock Stockpile
						GRAVELLY COBBLES (0.3 to 3) Gravelly; COBBLES; some sand; some boulders; trace silt; fine to coarse grained, angular, light and dark grey, massive, loose, dry. [Mine Rock]	
1.0	934.0						
2.0	933.0						
3.0	932.0					End of Test Pit: 3 m Wall instability	
4.0	931.0						
5.0	930.0						
	929.0						

GENERAL REMARKS:
Pit walls unstable, no groundwater, no excavation difficulties.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-223

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, TEST PIT LOG, 2014 KP DATA TEMPLATE REVB.GDT, 17-Mar-15

Project: AJAX PROJECT
Test Pit No.: TP14-224
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 324
Date Started: 5 Sep 14

Location: Haul / Access Roads
Total Depth: 3.7 m
Date Completed: 5 Sep 14

Coordinates: 685,352 E , 5,609,023 N UTM NAD83 ZONE10
Elevation: 897 m
Logged by: JAG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
						TOPSOIL/ORGANICS (0 to 0.2) ORGANICS; root mat; and TOPSOIL; Sandy SILT; trace gravel; fine grained; poorly graded, dark brown, massive, loose, moist.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.3 m 0.3 m - C: 0.3 - 1.1 m
						SANDY SILT (0.2 to 0.3) Sandy SILT; trace gravel; fine grained; poorly graded, medium brown, massive, moderately dense, dry. [Loess]	
1.0	896.0					**SAND AND GRAVEL** (0.3 to 1.1) SAND and GRAVEL; some silt; some cobbles; fine to coarse grained; sub angular to rounded; well graded, light white-brown, massive, moderately dense, dry.	
						SILTY GRAVELLY SAND (1.1 to 3.7) Silty gravelly SAND; some cobbles; trace boulders; fine to coarse grained; sub angular to sub rounded; well graded, medium brown, massive, dense, moist. [Glacial Till]	
2.0	895.0						
3.0	894.0	G B	TP14-224-1				
						End of Test Pit: 3.7 m Refusal on dense material/ boulders	
4.0	893.0						
5.0	892.0						

GENERAL REMARKS:
Pit walls stable, no groundwater, excavation difficult due to dense material and boulders.

SAMPLING SYMBOLS:
G B GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-224

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, TEST PIT LOG, 2014 KP DATA TEMPLATE REVB.GDT, 17-Mar-15

Project: AJAX PROJECT
Test Pit No.: TP14-225
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 5 Sep 14

Location: Old Mine Rock Facility / Ore Stockpile
Total Depth: 4.2 m
Date Completed: 5 Sep 14

Coordinates: 684,401 E , 5,608,655 N UTM NAD83 ZONE10
Elevation: 937.4 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	937.0					**SAND** (0 to 0.4) SAND; some silt; some gravel; trace cobbles; fine to coarse grained, angular to sub rounded; poorly graded, medium to dark brown, massive, loose, moist.	0 m - Old Mine Rock Stockpile
						GRAVELLY COBBLES (0.4 to 4.2) Gravelly; COBBLES; some sand; trace silt; trace boulders; fine to coarse grained, non-plastic, angular, well graded, light grey, massive, loose, dry. [Mine Rock]	
1.0	936.0						
		G B	TP14-225-1				
2.0	935.0						
3.0	934.0						
4.0	933.0					End of Test Pit: 4.2 m Wall Instability	
5.0	932.0						

GENERAL REMARKS:
Pit walls stable, no groundwater, no excavation difficulties.

SAMPLING SYMBOLS:
G B GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-225

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, TEST PIT LOG, 2014 KP DATA TEMPLATE REVB.GDT, 17-Mar-15

Project: AJAX PROJECT
Test Pit No.: TP14-226
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 324
Date Started: 5 Sep 14

Location: Old Mine Rock Facility / Ore Stockpile
Total Depth: 4.3 m
Date Completed: 5 Sep 14

Coordinates: 684,930 E , 5,608,746 N UTM NAD83 ZONE10
Elevation: 918 m
Logged by: JAG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
						TOPSOIL/ORGANICS (0 to 0.2) ORGANICS; root mat; and TOPSOIL; Sandy SILT; trace gravel; trace cobbles; fine grained; poorly graded, dark brown, massive, loose, moist.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.3 m 0.3 m - C: 0.3 - 0.9 m
						SANDY SILT (0.2 to 0.3) Sandy SILT; trace gravel; trace cobbles; fine grained; poorly graded, medium brown, massive, moderately dense, dry. [Loess]	
1.0	917.0					**SILTY GRAVELLY SAND** (0.3 to 0.9) Silty gravelly SAND; trace cobbles; fine to coarse grained; sub angular to sub rounded; well graded, light white-brown, massive, moderately dense, dry.	
						SILTY SAND AND GRAVEL (0.9 to 4.3) Silty SAND and GRAVEL; trace cobbles; fine to coarse grained; sub angular to sub rounded; well graded, medium brown, massive, moderately dense to dense, dry to moist with moisture content increasing with depth. [Glacial Till]	
2.0	916.0						
3.0	915.0						
4.0	914.0					End of Test Pit: 4.3 m Limit of excavator	
5.0	913.0						

GENERAL REMARKS:
Pit walls stable, no groundwater, no excavation difficulties.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-226

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, TEST PIT LOG, 2014 KP DATA TEMPLATE REVB.GDT, 17-Mar-15

Project: AJAX PROJECT
Test Pit No.: TP14-227
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 5 Sep 14

Location: Old Mine Rock Facility / Ore Stockpile
Total Depth: 4.5 m
Date Completed: 5 Sep 14

Coordinates: 684,597 E , 5,608,655 N UTM NAD83 ZONE10
Elevation: 936 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
						SAND (0 to 0.5) SAND; some silt; some gravel; trace cobbles; fine to coarse grained; non-plastic, angular to sub rounded; poorly graded, medium brown, massive, loose, moist.	0 m - Old Mine Rock Stockpile
1.0	935.0					**GRAVELLY COBBLES** (0.5 to 4.5) Gravelly; COBBLES; some sand; trace silt; trace boulders; fine to coarse grained, non-plastic, angular sub angular, well graded, light to medium grey, massive, moderately dense, dry. [Mine Rock]	
2.0	934.0						
3.0	933.0						
4.0	932.0					End of Test Pit: 4.5 m Wall instability	
5.0	931.0						

GENERAL REMARKS:
Pit walls sloughing in, no groundwater, no excavation difficulties.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-227

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, TEST PIT LOG, 2014 KP DATA TEMPLATE REVB.GDT, 17-Mar-15

Project: AJAX PROJECT
Test Pit No.: TP14-228
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 324
Date Started: 5 Sep 14

Location: Old Mine Rock Facility / Ore Stockpile
Total Depth: 4.3 m
Date Completed: 5 Sep 14

Coordinates: 684,799 E , 5,608,657 N UTM NAD83 ZONE10
Elevation: 934 m
Logged by: JAG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0						**TOPSOIL/ORGANICS** (0 to 0.15) ORGANICS; root mat; and TOPSOIL; Sandy SILT; trace gravel; fine grained; poorly graded, dark brown, massive, loose, moist.	0 m - A: 0 - 0.15 m 0.15 m - B: 0.15 - 0.4 m 0.4 m - C: 0.4 - 0.9 m
						SANDY SILT (0.15 to 0.4) Sandy SILT; trace gravel; fine grained; poorly graded, medium brown, massive, moderately dense, dry. [Loess]	
1.0	933.0					**SILTY GRAVELLY SAND** (0.4 to 0.9) Silty gravelly SAND; trace cobbles; fine to coarse grained; sub angular to sub rounded; well graded, light greyish-brown, massive, moderately dense, dry.	
						SANDY GRAVELLY SILT (0.9 to 4.3) Sandy Gravelly SILT; trace cobbles; fine to coarse grained; sub angular to sub rounded; well graded, medium brown, massive, dense, moist. [Glacial Till]	
2.0	932.0						
3.0	931.0						
4.0	930.0					End of Test Pit: 4.3 m Limit of excavator	
5.0	929.0						

GENERAL REMARKS:
Pit walls stable, no groundwater, no excavation difficulties.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-228

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, TEST PIT LOG, 2014 KP DATA TEMPLATE REVB.GDT, 17-Mar-15

Project: AJAX PROJECT
Test Pit No.: TP14-229
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 5 Sep 14

Location: Old Mine Rock Facility / Ore Stockpile
Total Depth: 4 m
Date Completed: 5 Sep 14

Coordinates: 684,013 E , 5,608,660 N UTM NAD83 ZONE10
Elevation: 920.9 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	920.0					**TOPSOIL/ORGANICS** (0 to 0.05) ORGANICS; root mat; and TOPSOIL; SILT; some sand; trace gravel; fine to coarse grained; non-plastic; poorly graded, dark brown, massive, loose, moist.	0 m - A: 0 - 0.05 m 0.05 m - B: 0.05 - 0.3 m 0.3 m - C: 0.3 - 0.5 m
						SILT (0.05 to 0.3) SILT; some sand; trace gravel; fine to coarse grained; non-plastic; poorly graded, medium brown, massive, moderately dense, moist. [Loess]	
1.0						**GRAVELLY SAND** (0.3 to 0.5) Gravelly SAND; some silt; fine to coarse grained, non-plastic, well graded, light grey, massive, moderately dense, dry.	
						SILTY GRAVELLY SAND (0.5 to 4) Silty gravelly SAND; some cobbles; trace boulders; fine to coarse grained; low plasticity, angular to sub rounded, well graded, dark brown, massive, dense, moist. [Glacial Till]	
2.0	919.0						
3.0	918.0						
4.0	917.0					End of Test Pit: 4 m Limit of excavator	
5.0	916.0						
	915.0						

GENERAL REMARKS:
Pit walls stable, no groundwater, no excavation difficulties.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-229

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, TEST PIT LOG, 2014 KP DATA TEMPLATE REVB.GDT, 17-Mar-15

Project: AJAX PROJECT
Test Pit No.: TP14-230
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 324
Date Started: 6 Sep 14

Location: WMRSF
Total Depth: 2.2 m
Date Completed: 6 Sep 14

Coordinates: 683,822 E , 5,608,872 N UTM NAD83 ZONE10
Elevation: 919 m
Logged by: JAG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	919.0					**SANDY SILT** (0 to 0.2) Sandy SILT; some gravel; fine to coarse grained; sub angular to sub rounded, well graded, medium brown, massive, moderately dense, moist.	0 m - Old Mine Rock Stockpile
						SANDY GRAVEL (0.2 to 2.2) Sandy GRAVEL; some silt; some cobbles; fine to coarse grained, angular to sub angular, well graded, light brownish-grey, massive, moderately dense, dry. [Mine Rock]	
1.0	918.0						
2.0	917.0					End of Test Pit: 2.2 m Wall instability	
3.0	916.0						
4.0	915.0						
5.0	914.0						

GENERAL REMARKS:
Pit walls sloughing in, no groundwater, excavation difficult due to boulders and wall instability.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-230

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-231
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 6 Sep 14

Location: Old Mine Rock Facility / Ore Stockpile
Total Depth: 2.8 m
Date Completed: 6 Sep 14

Coordinates: 684,092 E , 5,608,453 N UTM NAD83 ZONE10
Elevation: 953.4 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	953.0					**TOPSOIL/ORGANICS** (0 to 0.1) ORGANICS; root mat; and TOPSOIL; Silty SAND; trace gravel; fine to coarse grained, sub angular to rounded, poorly graded, dark brown, massive, loose, dry.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.7 m
						SILTY SAND (0.1 to 0.7) Silty SAND; trace gravel; trace cobbles; fine to coarse grained, sub angular to rounded, poorly graded, medium brown, massive, moderately dense, dry. [Loess]	0.7 m - C: 0.7 - 1.0 m
1.0	952.0					**GRAVELLY SAND** (0.7 to 1) Gravelly SAND; some silt; fine to coarse grained, non-plastic, angular to sub rounded, well graded, light grey, massive, dense, dry.	
						SILTY GRAVELLY SAND (1 to 2.8) Silty gravelly SAND; some cobbles; fine to coarse grained; low plasticity, angular to sub rounded, well graded, dark greyish-brown, massive, very dense, moist. [Glacial Till]	
2.0	951.0						
3.0	950.0					End of Test Pit: 2.8 m Refusal on dense material	
4.0	949.0						
5.0	948.0						

GENERAL REMARKS:
Pit walls stable, no groundwater, excavation difficult after 1 m.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-231

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-232
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 324
Date Started: 6 Sep 14

Location: WMRSF
Total Depth: 4.2 m
Date Completed: 6 Sep 14

Coordinates: 683,993 E , 5,608,849 N UTM NAD83 ZONE10
Elevation: 926 m
Logged by: JAG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
						SILTY SAND (0 to 0.6) Silty SAND; some gravel; fine to coarse grained; angular to sub rounded; well graded, medium brown, massive, moderately dense, moist.	0 m - Old Mine Rock Stockpile
1.0	925.0					**GRAVEL COBBLES AND BOULDERS** (0.6 to 4.2) GRAVEL, COBBLES, and BOULDERS; some sand; trace silt; coarse grained, angular, light grey, massive, dense, dry. Increasing moisture content after 2.0 m. [Mine Rock]	
2.0	924.0						
3.0	923.0						
4.0	922.0					End of Test Pit: 4.2 m Limit of excavator	
5.0	921.0						

GENERAL REMARKS:
Pit walls slightly unstable, no groundwater, excavation difficult due to boulders and wall stability.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-232

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-233
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 6 Sep 14

Location: WMRSF
Total Depth: 0.5 m
Date Completed: 6 Sep 14

Coordinates: 683,898 E , 5,608,457 N UTM NAD83 ZONE10
Elevation: 957.7 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	957.7					**TOPSOIL/ORGANICS** (0 to 0.15) ORGANICS; root mat; and TOPSOIL; SAND and SILT; trace gravel; fine to coarse grained; sub angular to rounded, poorly graded, dark brown, massive, loose, moist.	0 m - A: 0 - 0.15 m 0.15 m - B: 0.15 - 0.5 m
						SILTY SAND (0.15 to 0.5) Silty SAND; trace gravel; trace cobbles; fine to coarse grained, non-plastic, angular to sub rounded, gap graded, medium brown, massive, moderately dense, dry. [Colluvium]	
1.0	957.0					**WEATHERED BEDROCK** (0.5) Light grey-green, massive, slightly weathered, strong, mafic volcanics ? End of Test Pit: 0.5 m Refusal on weathered bedrock	
2.0	956.0						
3.0	955.0						
4.0	954.0						
5.0	953.0						
	952.0						

GENERAL REMARKS:
No groundwater, no excavation difficulties, visible bedrock outcrop near site.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-233

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-234
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 324
Date Started: 6 Sep 14

Location: Old Mine Rock Facility / Ore Stockpile
Total Depth: 4.4 m
Date Completed: 6 Sep 14

Coordinates: 684,198 E , 5,608,831 N UTM NAD83 ZONE10
Elevation: 924 m
Logged by: JAG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0						**SILTY SAND** (0 to 0.5) Silty SAND; some gravel; trace cobbles; fine to coarse grained; angular to sub rounded; well graded, medium brown, massive, moderately dense, moist.	0 m - Old Mine Rock Stockpile
						SANDY GRAVEL (0.5 to 0.6) Sandy GRAVEL; some cobbles; coarse grained, angular to sub angular, poorly graded, light grey, massive, moderately dense, dry.	
1.0	923.0					**SILTY GRAVELLY SAND** (0.6 to 2.6) Silty gravelly SAND; some cobbles; fine to coarse grained; angular to sub rounded, well graded, medium brown, massive, moderately dense, moist. [Mine Rock]	
2.0	922.0						
						SANDY GRAVELLY COBBLES (2.6 to 4.4) Sandy Gravelly; COBBLES; trace boulders; coarse grained, angular to sub angular, medium brownish-grey, massive, loose to moderately dense, moist. [Mine Rock]	
3.0	921.0						
4.0	920.0					End of Test Pit: 4.4 m Limit of excavator	
5.0	919.0						

GENERAL REMARKS:
Pit walls slightly unstable, no groundwater, no excavation difficulties.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-234

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-235
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 6 Sep 14

Location: WMRSF
Total Depth: 4.6 m
Date Completed: 6 Sep 14

Coordinates: 683,903 E , 5,608,255 N UTM NAD83 ZONE10
Elevation: 973.3 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	973.0					**TOPSOIL/ORGANICS** (0 to 0.2) ORGANICS; root mat; and TOPSOIL; Silty SAND; trace gravel; fine to coarse grained, sub angular to rounded, poorly graded, dark brown, massive, loose, moist.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.6 m
						SILTY SAND (0.2 to 0.6) Silty SAND; trace gravel; fine to coarse grained, sub angular to rounded, poorly graded, medium brown, massive, moderately dense, dry.	0.6 m - C: 0.6 - 1.1 m
1.0	972.0					**SILTY GRAVELLY SAND** (0.6 to 1.1) Silty gravelly SAND; trace cobbles; fine to coarse grained; non-plastic, angular to sub rounded, well graded, light grey, massive, dense, dry.	
						SILTY GRAVELLY SAND (1.1 to 4.6) Silty gravelly SAND; trace cobbles; fine to coarse grained; low plasticity, angular to sub rounded, well graded, dark grey-brown, massive, very dense, moist. [Glacial Till]	
2.0	971.0						
3.0	970.0						
4.0	969.0	G B	TP14-235-1			End of Test Pit: 4.6 m Limit of excavator	
5.0	968.0						

GENERAL REMARKS:
Pit walls stable, no groundwater, excavation difficult due to dense material.

SAMPLING SYMBOLS:
G B GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-235

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-236
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 324
Date Started: 6 Sep 14

Location: Old Mine Rock Facility / Ore Stockpile
Total Depth: 3.8 m
Date Completed: 6 Sep 14

Coordinates: 684,281 E , 5,609,054 N UTM NAD83 ZONE10
Elevation: 909 m
Logged by: JAG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	909.0					**SILTY SAND** (0 to 0.4) Silty SAND; some gravel; trace cobbles; fine to coarse grained; sub angular to sub rounded; well graded, medium brown, massive, moderately dense, moist.	0 m - Old Mine Rock Stockpile
						GRAVEL AND COBBLES (0.4 to 3.8) GRAVEL and COBBLES; some silt; some sand; some boulders; coarse grained, angular, medium brownish-grey, massive, moderately dense to loose, dry to moist at 2.5 m. [Mine Rock]	
1.0	908.0						
2.0	907.0						
3.0	906.0						
4.0	905.0					End of Test Pit: 3.8 m Wall instability	
5.0	904.0						

GENERAL REMARKS:
Pit walls sloughing in, no groundwater, no excavation difficulties.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-236

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, TEST PIT LOG, 2014 KP DATA TEMPLATE REVB.GDT, 17-Mar-15

Project: AJAX PROJECT
Test Pit No.: TP14-237
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 6 Sep 14

Location: WMRSF
Total Depth: 4.8 m
Date Completed: 6 Sep 14

Coordinates: 684,193 E , 5,608,250 N UTM NAD83 ZONE10
Elevation: 960.8 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	960.8					**TOPSOIL/ORGANICS** (0 to 0.1) ORGANICS; root mat; and TOPSOIL; Sandy SILT; trace gravel; fine grained; poorly graded, dark brown, massive, loose, dry.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.5 m
						SANDY SILT (0.1 to 0.5) Sandy SILT; trace gravel; fine grained; poorly graded, medium brown, massive, moderately dense, dry. [Loess]	0.5 m - C: 0.5 - 1.1 m
1.0	960.0					**SILTY GRAVELLY SAND** (0.5 to 1.1) Silty gravelly SAND; trace cobbles; fine to coarse grained; non-plastic, angular to sub rounded, well graded, light grey, massive, dense, dry.	
						SILTY GRAVELLY SAND (1.1 to 4.8) Silty gravelly SAND; some cobbles; trace clay; fine to coarse grained; low to medium plasticity, angular to sub rounded, well graded, dark greyish-brown, massive, dense, moist. [Glacial Till]	
2.0	959.0						
3.0	958.0						
4.0	957.0						
5.0	956.0					End of Test Pit: 4.8 m Limit of excavator	
	955.0						

GENERAL REMARKS:
Pit walls stable, no groundwater, excavation difficult after 1 m.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-237

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, TEST PIT LOG, 2014 KP DATA TEMPLATE REVB.GDT, 17-Mar-15

Project: AJAX PROJECT
Test Pit No.: TP14-238
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 324
Date Started: 6 Sep 14

Location: Old Mine Rock Facility / Ore Stockpile
Total Depth: 4.3 m
Date Completed: 6 Sep 14

Coordinates: 684,067 E , 5,609,034 N UTM NAD83 ZONE10
Elevation: 899 m
Logged by: JAG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0						**TOPSOIL/ORGANICS** (0 to 0.1) ORGANICS; root mat; and TOPSOIL; Sandy SILT; trace gravel; fine grained; poorly graded, dark brown, massive, loose, moist.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.25 m 0.25 m - C: 0.25 - 0.8 m
						SANDY SILT (0.1 to 0.25) Sandy SILT; trace gravel; fine grained; poorly graded, medium brown, massive, moderately dense, dry.	
1.0	898.0					**SILTY GRAVELLY SAND** (0.25 to 0.8) Silty gravelly SAND; trace cobbles; fine to coarse grained; well graded, light white-brown, massive, moderately dense, dry. [Colluvium]	
						SILT (0.8 to 4.3) SILT; some sand; some gravel; fine to coarse grained; low plasticity, well graded, medium brown, massive, dense, dry to moist at 1.0 m. [Colluvium]	
2.0	897.0						
3.0	896.0						
4.0	895.0	GB	TP14-238-1				
						End of Test Pit: 4.3 m Limit of excavator	
5.0	894.0						

GENERAL REMARKS:
Pit walls stable, no groundwater, no excavation difficulties.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-238

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, TEST PIT LOG, 2014 KP DATA TEMPLATE REVB.GDT, 17-Mar-15

Project: AJAX PROJECT

Test Pit No.: TP14-239 **Page:** 1 of 1

Contractor: Cobra Contracting Ltd. Equipment Used: CAT 320D L Date Started: 6 Sep 14

Location: Old Mine Rock Facility / Ore Stockpile Total Depth: 4.4 m Date Completed: 6 Sep 14

Coordinates: 684,390 E , 5,608,252 N UTM NAD83 ZONE10 Elevation: 934.3 m Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	934.0					**TOPSOIL/ORGANICS** (0 to 0.2) ORGANICS; root mat; and TOPSOIL; Silty SAND; trace gravel; fine to coarse grained, sub angular to rounded, poorly graded, dark brown, massive, loose, dry.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.5 m
						SILTY SAND (0.2 to 0.5) Silty SAND; trace gravel; fine to coarse grained, sub angular to rounded, poorly graded, medium brown, massive, dense, dry.	0.5 m - C: 0.5 - 0.8 m
1.0	933.0					**SILTY SAND AND GRAVEL** (0.5 to 1.2) Silty sandy GRAVEL; trace cobbles; fine to coarse grained, non-plastic, angular to sub rounded, poorly graded, massive, dense.	
						SILTY GRAVELLY SAND (1.2 to 4.4) Silty gravelly SAND; some cobbles; fine to coarse grained, non-plastic, angular to sub rounded, well graded, dark greyish-brown, massive, dense to very dense, moist. [Glacial Till]	
2.0	932.0						
3.0	931.0						
4.0	930.0					End of Test Pit: 4.4 m Limit of excavator	
5.0	929.0						

GENERAL REMARKS:

Pit walls stable, no groundwater, excavation difficult after 0.5 m.

SAMPLING SYMBOLS:

GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-239

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, TEST PIT LOG, 2014 KP DATA TEMPLATE REVB.GDT, 17-Mar-15

Project: AJAX PROJECT
Test Pit No.: TP14-240
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 324
Date Started: 6 Sep 14

Location: Old Mine Rock Facility / Ore Stockpile
Total Depth: 3.2 m
Date Completed: 6 Sep 14

Coordinates: 684,468 E , 5,609,031 N UTM NAD83 ZONE10
Elevation: 921 m
Logged by: JAG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	921.0					**SANDY SILT** (0 to 0.4) Sandy SILT; some gravel; trace cobbles; fine to coarse grained; angular to sub rounded; well graded, medium brown, massive, loose, moist.	0 m - Old Mine Rock Stockpile
						SILTY SAND AND GRAVEL (0.4 to 3.2) Silty SAND and GRAVEL; some cobbles; some boulders; fine to coarse grained, angular to sub rounded, medium grey, massive, moderately dense, moist. [Mine Rock]	
1.0	920.0						
2.0	919.0						
3.0	918.0						
						End of Test Pit: 3.2 m Refusal on boulders	
4.0	917.0						
5.0	916.0						

GENERAL REMARKS:
Pit walls unstable due to large particle size, no groundwater, difficult excavation due to boulders.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-240

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, TEST PIT LOG, 2014 KP DATA TEMPLATE REVB.GDT, 17-Mar-15

Project: AJAX PROJECT
Test Pit No.: TP14-241
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 8 Sep 14

Location: Old Mine Rock Facility / Ore Stockpile
Total Depth: 4.9 m
Date Completed: 8 Sep 14

Coordinates: 684,706 E , 5,608,453 N UTM NAD83 ZONE10
Elevation: 936.7 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	936.7					**TOPSOIL/ORGANICS** (0 to 0.15) ORGANICS; root mat; and TOPSOIL; Sandy SILT; trace gravel; fine to coarse grained; sub angular to sub rounded, poorly graded, dark brown, massive, loose, moist.	0 m - A: 0 - 0.15 m
	936.0					**SILTY GRAVELLY SAND** (0.15 to 0.9) Silty gravelly SAND; some cobbles; fine to coarse grained; angular to sub rounded, well graded, medium brownish-grey, massive, dense, dry.	
1.0						**SILTY GRAVELLY SAND** (0.9 to 4.9) Silty gravelly SAND; some cobbles; fine to coarse grained; angular to sub rounded, well graded, medium to dark greyish-brown, massive, dense increasing with depth, dry to moist with water content increasing with depth. [Glacial Till]	
	935.0						
2.0							
	934.0						
3.0							
	933.0						
4.0							
	932.0						
5.0						End of Test Pit: 4.9 m Limit of excavator	
	931.0						

GENERAL REMARKS:
Walls stable, no groundwater, easy to excavate.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-241

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-242
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 324
Date Started: 8 Sep 14

Location: Old Mine Rock Facility / Ore Stockpile
Total Depth: 5.2 m
Date Completed: 8 Sep 14

Coordinates: 684,497 E , 5,608,072 N UTM NAD83 ZONE10
Elevation: 955 m
Logged by: JAG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
						TOPSOIL/ORGANICS (0 to 0.15) ORGANICS; root mat; and TOPSOIL; Sandy SILT; trace gravel; trace cobbles; fine grained; poorly graded, dark brown, massive, loose, spongy, moist.	0 m - A: 0 - 0.15 m
						SILTY SAND (0.15 to 0.9) Silty: SAND; some gravel; fine to coarse grained, sub angular to sub rounded; well graded, light brown, massive, moderately dense, dry.	
1.0	954.0					**SANDY SILT AND CLAY** (0.9 to 5.2) Sandy SILT and CLAY; fine grained; some gravel; trace cobbles; sub angular to sub rounded; well graded; medium plasticity, medium greyish brown, massive, dense, moist with water content increasing with depth. [Glacial Till]	
2.0	953.0						
3.0	952.0						
4.0	951.0						
5.0	950.0	GB	TP14-242-1			End of Test Pit: 5.2 m Limit of excavator	

GENERAL REMARKS:
Walls stable, no groundwater, easy excavation.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-242

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-243
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 8 Sep 14

Location: EMRSF
Total Depth: 4.5 m
Date Completed: 8 Sep 14

Coordinates: 684,870 E , 5,608,078 N UTM NAD83 ZONE10
Elevation: 953.8 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	953.8					**TOPSOIL/ORGANICS** (0 to 0.2) ORGANICS; root mat; and TOPSOIL; Sandy SILT; trace gravel; fine to coarse grained; sub angular to rounded; non-plastic; poorly graded, dark brown, massive, loose, moist.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.5 m
						SILTY SAND (0.2 to 0.5) Silty SAND; trace gravel; fine to coarse grained, angular to sub rounded, poorly graded, medium to light brown, moderately dense to dense.	0.5 m - C: 0.5 - 1.3 m
1.0	953.0					**SILTY GRAVELLY SAND** (0.5 to 1.3) Silty gravelly SAND; trace cobbles; fine to coarse grained; angular to sub rounded, non-plastic, well graded, light greyish-brown, massive, dense, dry.	
						SILTY GRAVELLY SAND (1.3 to 4.5) Silty gravelly SAND; trace clay; trace cobbles; fine to coarse grained; angular to sub rounded, non-plastic, well graded, dark greyish-brown, massive, very dense, moist. [Glacial Till]	
2.0	952.0						
3.0	951.0						
4.0	950.0						
						End of Test Pit: 4.5 m Limit of excavator	
5.0	949.0						
	948.0						

GENERAL REMARKS:
Walls stable, no groundwater, easy to excavate.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-243

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-244
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 324
Date Started: 8 Sep 14

Location: Old Mine Rock Facility / Ore Stockpile
Total Depth: 3.9 m
Date Completed: 8 Sep 14

Coordinates: 684,704 E , 5,608,040 N UTM NAD83 ZONE10
Elevation: 937 m
Logged by: JAG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0						**TOPSOIL/ORGANICS** (0 to 0.2) ORGANICS; root mat; and TOPSOIL; Sandy SILT; trace gravel; trace cobbles; fine grained; sub rounded; poorly graded, dark brown, massive, loose, moist.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.4 m 0.4 m - C: 0.4 - 1.0 m
						SANDY SILT (0.2 to 0.4) Sandy SILT; trace gravel; trace cobbles; fine grained; sub rounded; poorly graded, medium brown, massive, loose, dry.	
1.0	936.0					**SILTY GRAVELLY SAND** (0.4 to 1) Silty gravelly SAND; trace cobbles; fine to coarse grained; sub angular to sub rounded, light white-brown, massive, moderately dense, dry.	
						SANDY SILT (1 to 2.5) Sandy SILT; some gravel; trace cobbles; fine to coarse grained, sub angular to sub rounded, medium brown, massive, dense, moist.	
2.0	935.0						
3.0	934.0					**SILTY SAND AND GRAVEL** (2.5 to 3.9) Silty SAND and GRAVEL; some cobbles; coarse grained, angular to sub rounded, medium brown, massive, dense, moist. [Glacial Till]	
		GB	TP14-244-1				
4.0	933.0					End of Test Pit: 3.9 m Limit of excavator	
5.0	932.0						

GENERAL REMARKS:
Walls stable, no groundwater, easy excavation.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-244

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT

Contractor: Cobra Contracting Ltd.

Location: Old Mine Rock Facility / Ore Stockpile

Coordinates: 684,821 E , 5,608,241 N UTM NAD83 ZONE10

Test Pit No.: TP14-245

Equipment Used: CAT 320D L

Total Depth: 4.4 m

Elevation: 930.7 m

Page: 1 of 1

Date Started: 8 Sep 14

Date Completed: 8 Sep 14

Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	930.0					**TOPSOIL/ORGANICS** (0 to 0.2) ORGANICS; root mat; and TOPSOIL; Sandy SILT; trace gravel; fine to coarse grained; sub angular to rounded; poorly graded, dark brown, massive, loose, moist.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.5 m
						SANDY SILT (0.2 to 0.5) Sandy SILT; some gravel; fine to coarse grained, angular to sub rounded, poorly graded, medium brown, moderately dense to dense, dry.	
1.0						**SILTY GRAVELLY SAND** (0.5 to 4.4) Silty gravelly SAND; some cobbles; trace clay; fine to coarse grained; angular to sub rounded, low plasticity, gap graded, dark greyish-brown, massive, very dense, moist. [Glacial Till]	
2.0	929.0						
	928.0						
3.0							
	927.0						
4.0		GB	TP14-245-1				
	926.0					End of Test Pit: 4.4 m Limit of excavator	
5.0							
	925.0						

GENERAL REMARKS:

Walls stable, no groundwater, difficult to excavate.

SAMPLING SYMBOLS:

GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-245

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-246
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 324
Date Started: 8 Sep 14

Location: EMRSF
Total Depth: 4.1 m
Date Completed: 8 Sep 14

Coordinates: 684,800 E , 5,607,849 N UTM NAD83 ZONE10
Elevation: 967 m
Logged by: JAG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
						TOPSOIL/ORGANICS (0 to 0.2) ORGANICS; root mat; and TOPSOIL; Sandy SILT; trace gravel; fine grained; non-plastic; poorly graded, dark brown, massive, loose, moist.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.6 m
						SANDY SILT (0.2 to 0.6) Sandy SILT; some gravel; fine to coarse grained, subangular to subrounded, medium brown, massive, moderately dense, dry.	0.6 m - C: 0.6 - 1.2 m
1.0	966.0					**SILTY GRAVELLY SAND** (0.6 to 1.2) Silty gravelly SAND; fine to coarse grained; subangular to subrounded, light white-brown, massive, moderately dense, dry.	
		G B	TP14-246-1			**SILTY GRAVELLY SAND** (1.2 to 4.1) Silty gravelly SAND; some cobbles; trace boulders; fine to coarse grained; subangular to rounded, medium brown, massive, moderately dense to dense, moist. [Glacial Till]	
2.0	965.0						
3.0	964.0						
4.0	963.0					End of Test Pit: 4.1 m Limit of excavator	
5.0	962.0						

GENERAL REMARKS:
Walls stable, no groundwater, easy excavation.

SAMPLING SYMBOLS:
G B GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-246

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-247
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 8 Sep 14

Location: Old Mine Rock Facility / Ore Stockpile
Total Depth: 4 m
Date Completed: 8 Sep 14

Coordinates: 684,704 E , 5,608,249 N UTM NAD83 ZONE10
Elevation: 924.6 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	924.6					**TOPSOIL/ORGANICS** (0 to 0.2) ORGANICS; root mat; and TOPSOIL; Sandy SILT; trace gravel; fine to coarse grained; sub angular to rounded; non-plastic; poorly graded, dark brown, massive, loose, moist.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.4 m 0.4 m - C: 0.4 - 0.7 m
	924.0					**SANDY SILT** (0.2 to 0.4) Sandy SILT; some gravel; trace cobbles; fine to coarse grained; sub angular to rounded; non-plastic; poorly graded, medium brown, massive, moderately dense, moist.	
1.0						**SILTY GRAVELLY SAND** (0.4 to 1.3) Silty gravelly SAND; some cobbles; trace clay; fine to coarse grained; angular to sub rounded, well graded, light greyish-brown, massive, dense, dry.	
	923.0					**SILTY GRAVELLY SAND** (1.3 to 4) Silty gravelly SAND; some cobbles; trace clay; fine to coarse grained; angular to sub rounded, well graded, dark greyish-brown, massive, very dense, moist. [Glacial Till]	
2.0							
	922.0						
3.0							
	921.0						
4.0						**WEATHERED BEDROCK** (4) Light grey-green, massive, slightly weathered, strong, mafic volcanics End of Test Pit: 4 m Refusal on weathered bedrock	
	920.0						
5.0							
	919.0						

GENERAL REMARKS:
Walls stable, no groundwater, difficult to excavate from 1 m onwards.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-247

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-248
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 324
Date Started: 8 Sep 14

Location: EMRSF
Total Depth: 3.7 m
Date Completed: 8 Sep 14

Coordinates: 684,906 E , 5,607,647 N UTM NAD83 ZONE10
Elevation: 982 m
Logged by: JAG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0						**TOPSOIL/ORGANICS** (0 to 0.2) ORGANICS; root mat; and TOPSOIL; Sandy SILT; trace gravel; fine grained; non-plastic; poorly graded, dark brown, massive, loose, moist.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.3 m 0.3 m - C: 0.3 - 1.0 m
						SANDY SILT (0.2 to 0.3) Sandy SILT; trace gravel; fine grained; low plasticity; poorly graded, medium brown, massive, moderately dense, moist.	
1.0	981.0					**SILTY SAND** (0.3 to 1) Silty SAND; some gravel; fine to coarse grained, well graded, light white-brown, massive, moderately dense, dry.	
						SILTY SAND (1 to 3.7) Silty SAND; some gravel; fine to coarse grained, sub angular to sub rounded, slightly plastic, well graded, medium greyish-brown, massive, dense, moist. [Glacial Till]	
2.0	980.0						
3.0	979.0						
4.0	978.0					End of Test Pit: 3.7 m Limit of excavator	
5.0	977.0						

GENERAL REMARKS:
Walls stable, no groundwater, easy excavation.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-248

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-249
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 8 Sep 14

Location: EMRSF
Total Depth: 5 m
Date Completed: 8 Sep 14

Coordinates: 684,905 E , 5,607,876 N UTM NAD83 ZONE10
Elevation: 946.7 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	946.7					**TOPSOIL/ORGANICS** (0 to 0.2) ORGANICS; root mat; and TOPSOIL; Sandy SILT; trace gravel; fine to coarse grained; angular to rounded; poorly graded, dark brown, massive, loose, moist.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.6 m
	946.0					**SANDY SILT** (0.2 to 0.6) Silty SAND; some gravel; fine to coarse grained, angular to sub rounded, non-plastic, poorly graded, light grey, dense, moist. [Loess]	
1.0						**SANDY SILT** (0.6 to 5) Silty SAND; some gravel; trace cobbles; fine to coarse grained, sub angular to sub rounded, non-plastic, gap graded, medium to dark brown, dense, moist. [Glacial Till]	
	945.0						
2.0							
	944.0						
3.0							
	943.0						
4.0							
	942.0						
5.0						End of Test Pit: 5 m Limit of excavator	
	941.0						

GENERAL REMARKS:
Walls stable, no groundwater, easy to excavate to 5 m.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-249

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-250
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 324
Date Started: 8 Sep 14

Location: EMRSF
Total Depth: 0.45 m
Date Completed: 8 Sep 14

Coordinates: 684,689 E , 5,607,652 N UTM NAD83 ZONE10
Elevation: 984 m
Logged by: JAG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
						TOPSOIL/ORGANICS (0 to 0.35) ORGANICS; root mat; and TOPSOIL; Sandy SILT; trace gravel; fine grained; poorly graded, dark brown, massive, loose, spongy, moist.	0 m - A: 0 - 0.35 m
						SANDY SILT (0.35 to 0.45) Sandy SILT; trace gravel; fine grained; poorly graded, medium orange-brown, massive, moderately dense, dry.	
1.0	983.0					**WEATHERED BEDROCK** (0.45) Light grey-green, massive, slightly weathered, strong, mafic volcanics End of Test Pit: 0.45 m Refusal on bedrock	
2.0	982.0						
3.0	981.0						
4.0	980.0						
5.0	979.0						

GENERAL REMARKS:
No groundwater.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-250

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-251
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 324
Date Started: 8 Sep 14

Location: East Embankment
Total Depth: 0.8 m
Date Completed: 8 Sep 14

Coordinates: 684,458 E , 5,607,576 N UTM NAD83 ZONE10
Elevation: 1055 m
Logged by: JAG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0						**TOPSOIL/ORGANICS** (0 to 0.3) ORGANICS; root mat; and TOPSOIL; Sandy SILT; trace gravel; fine grained; non-plastic, poorly graded, dark brown, massive, loose, spongy, moist.	0 m - A: 0 - 0.3 m 0.3 m - B: 0.3 - 0.4 m 0.4 m - C: 0.4 - 0.8 m
						SANDY SILT (0.3 to 0.4) Sandy SILT; trace gravel; fine grained; non-plastic, poorly graded, medium brown, massive, moderately dense, dry.	
1.0	1054.0					**SILTY GRAVELLY SAND** (0.4 to 0.8) Silty gravelly SAND; fine to coarse grained; well graded, light white-brown, massive, moderately dense, dry.	
						WEATHERED BEDROCK (0.8) Light grey-green, massive, slightly weathered, strong, mafic volcanics End of Test Pit: 0.8 m Refusal on bedrock	
2.0	1053.0						
3.0	1052.0						
4.0	1051.0						
5.0	1050.0						

GENERAL REMARKS:
Walls stable, no groundwater.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-251

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, TEST PIT LOG, 2014 KP DATA TEMPLATE REVB.GDT, 17-Mar-15

Project: AJAX PROJECT
Test Pit No.: TP14-252
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 324
Date Started: 8 Sep 14

Location: TSF Basin
Total Depth: 3.8 m
Date Completed: 8 Sep 14

Coordinates: 684,166 E , 5,607,524 N UTM NAD83 ZONE10
Elevation: 1041 m
Logged by: JAG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0						**TOPSOIL/ORGANICS** (0 to 0.5) ORGANICS; root mat; and TOPSOIL; Sandy SILT; trace gravel; fine grained; non-plastic, poorly graded, dark brown, massive, loose, spongy, moist.	0 m - A: 0 - 0.5 m
						SILTY GRAVELLY SAND (0.5 to 0.9) Silty gravelly SAND; fine to coarse grained; well graded, light white-brown, massive, moderately dense, dry.	0.5 m - C: 0.5 - 0.9 m
1.0	1040.0					**SILTY SAND AND GRAVEL** (0.9 to 3.8) Silty SAND and GRAVEL; trace cobbles; fine to coarse grained, sub angular to sub rounded, well graded, medium brown, dense, moist. [Glacial Till]	
2.0	1039.0						
3.0	1038.0	G B	TP14-252-1				
4.0	1037.0					End of Test Pit: 3.8 m Refusal on dense material	
5.0	1036.0						

GENERAL REMARKS:
Walls stable, no groundwater, easy excavation.

SAMPLING SYMBOLS:
G B GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-252

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-253
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 324
Date Started: 8 Sep 14

Location: East Embankment
Total Depth: 0.5 m
Date Completed: 8 Sep 14

Coordinates: 684,341 E , 5,607,664 N UTM NAD83 ZONE10
Elevation: 1069 m
Logged by: JAG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
						TOPSOIL/ORGANICS (0 to 0.4) ORGANICS; root mat; and TOPSOIL; Sandy SILT; trace gravel; fine grained; non-plastic, poorly graded, dark brown, massive, loose, spongy, moist.	0 m - A: 0 - 0.4 m
						SANDY SILT (0.4 to 0.5) Sandy SILT; trace gravel; fine grained; non-plastic, poorly graded, medium brown, massive, loose, dry.	0.4 m - B: 0.4 - 0.5 m
1.0	1068.0					**WEATHERED BEDROCK** (0.5) Light grey-green, massive, slightly weathered, strong, mafic volcanics End of Test Pit: 0.5 m Refusal on bedrock	
2.0	1067.0						
3.0	1066.0						
4.0	1065.0						
5.0	1064.0						

GENERAL REMARKS:
No groundwater.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-253

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, TEST PIT LOG, 2014 KP DATA TEMPLATE REVB.GDT, 17-Mar-15

Project: AJAX PROJECT | **Test Pit No.:** TP14-254 | **Page:** 1 of 1

Contractor: Cobra Contracting Ltd. | Equipment Used: CAT 324 | Date Started: 9 Sep 14

Location: East Embankment | Total Depth: 2.9 m | Date Completed: 9 Sep 14

Coordinates: 684,654 E , 5,607,487 N UTM NAD83 ZONE10 | Elevation: 1017 m | Logged by: JAG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
						TOPSOIL/ORGANICS (0 to 0.2) ORGANICS; root mat; and TOPSOIL; Sandy SILT; trace gravel; fine grained; non-plastic, poorly graded, dark brown, massive, loose, spongy, moist.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.4 m 0.4 m - C: 0.4 - 0.8 m
						SANDY SILT (0.2 to 0.4) Sandy SILT; trace gravel; fine grained; non-plastic, poorly graded, medium brown, massive, moderately dense, dry.	
1.0	1016.0					**SILTY GRAVELLY SAND** (0.4 to 0.8) Silty gravelly SAND; fine to coarse grained; well graded, light white-brown, massive, moderately dense, dry.	
						SILTY SAND AND GRAVEL (0.8 to 2.9) Silty SAND and GRAVEL; trace cobbles; fine to coarse grained, sub angular to sub rounded, well graded, medium brown, massive, dense, moist. [Glacial Till]	
2.0	1015.0						
3.0	1014.0					End of Test Pit: 2.9 m Refusal on boulders/bedrock	
4.0	1013.0						
5.0	1012.0						

GENERAL REMARKS:

Walls stable, no groundwater, easy excavation.

SAMPLING SYMBOLS:

GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-254

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, TEST PIT LOG, 2014 KP DATA TEMPLATE REVB.GDT, 17-Mar-15

Project: AJAX PROJECT
Test Pit No.: TP14-255
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 9 Sep 14

Location: WMRSF
Total Depth: 1.2 m
Date Completed: 9 Sep 14

Coordinates: 683,892 E , 5,608,079 N UTM NAD83 ZONE10
Elevation: 977.7 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	977.7					**TOPSOIL/ORGANICS** (0 to 0.1) ORGANICS; root mat; and TOPSOIL; Sandy SILT; trace gravel; fine to coarse grained; sub angular to rounded; poorly graded, dark brown, massive, loose, moist.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.3 m 0.3 m - C: 0.3 - 1.2 m
	977.0					**SANDY SILT** (0.1 to 0.3) Sandy SILT; trace gravel; fine to coarse grained; sub angular to rounded; poorly graded, medium brown, massive, moderately dense, moist.	
1.0						**SILTY GRAVELLY SAND** (0.3 to 1.2) Silty gravelly SAND; trace cobbles; trace boulders; fine to coarse grained; angular to sub rounded, non-plastic, well graded, light greyish-brown, massive, very dense, dry.	
	976.0					**WEATHERED BEDROCK** (1.2) Light grey-green, massive, slightly weathered, strong, mafic volcanics End of Test Pit: 1.2 m Refusal on weathered bedrock	
2.0							
	975.0						
3.0							
	974.0						
4.0							
	973.0						
5.0							
	972.0						

GENERAL REMARKS:
Walls sloughing slightly, no groundwater.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-255

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, TEST PIT LOG, 2014 KP DATA TEMPLATE REVB.GDT, 17-Mar-15

Project: AJAX PROJECT | **Test Pit No.:** TP14-256 | **Page:** 1 of 1

Contractor: Cobra Contracting Ltd. | Equipment Used: CAT 324 | Date Started: 9 Sep 14

Location: East Embankment | Total Depth: 3 m | Date Completed: 9 Sep 14

Coordinates: 684,738 E , 5,607,170 N UTM NAD83 ZONE10 | Elevation: 988 m | Logged by: JAG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	988.0					**TOPSOIL/ORGANICS** (0 to 0.2) ORGANICS; root mat; and TOPSOIL; Sandy SILT; trace gravel; fine grained; non-plastic, poorly graded, dark brown, massive, loose, moist.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.4 m 0.4 m - C: 0.4 - 0.7 m
						SANDY SILT (0.2 to 0.4) Sandy SILT; trace gravel; fine grained; non-plastic, poorly graded, medium brown, massive, moderately dense, dry.	
1.0	987.0					**SILTY GRAVELLY SAND** (0.4 to 0.7) Silty gravelly SAND; fine to coarse grained; well graded, light white-brown, massive, moderately dense, dry.	
						SILTY GRAVELLY SAND (0.7 to 3) Silty gravelly SAND; trace cobbles; fine to coarse grained; well graded, sub angular to sub rounded, medium brown, massive, dense, moist. [Glacial Till]	
2.0	986.0						
3.0	985.0	G B	TP14-256-1			End of Test Pit: 3 m Refusal on boulders/bedrock	
4.0	984.0						
5.0	983.0						

GENERAL REMARKS:

Walls stable, no groundwater, easy excavation.

SAMPLING SYMBOLS:

G B GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-256

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, TEST PIT LOG, 2014 KP DATA TEMPLATE REVB.GDT, 17-Mar-15

Project: AJAX PROJECT
Test Pit No.: TP14-257
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 324
Date Started: 9 Sep 14

Location: East Embankment
Total Depth: 4.4 m
Date Completed: 9 Sep 14

Coordinates: 684,633 E , 5,607,366 N UTM NAD83 ZONE10
Elevation: 1019 m
Logged by: JAG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0						**TOPSOIL/ORGANICS** (0 to 0.2) ORGANICS; root mat; and TOPSOIL; Sandy SILT; trace gravel; fine grained; poorly graded, dark brown, massive, loose, moist.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.4 m 0.4 m - C: 0.4 - 0.7 m
						SANDY SILT (0.2 to 0.4) Sandy SILT; trace gravel; fine grained; non-plastic, poorly graded, medium brown, massive, moderately dense, dry.	
1.0	1018.0					**SILTY GRAVELLY SAND** (0.4 to 0.7) Silty gravelly SAND; fine to coarse grained; well graded, sub angular to sub rounded, light white-brown, massive, moderately dense, dry.	
						SANDY GRAVELLY SILT (0.7 to 4.4) Sandy Gravelly SILT; trace cobbles; fine to coarse grained, sub angular to sub rounded, slightly plastic, well graded, medium greyish-brown, massive, dense, moist. [Glacial Till]	
2.0	1017.0						
3.0	1016.0						
4.0	1015.0					End of Test Pit: 4.4 m Limit of excavator	
5.0	1014.0						

GENERAL REMARKS:
Walls stable, no groundwater, easy excavation.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-257

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, TEST PIT LOG, 2014 KP DATA TEMPLATE REVB.GDT, 17-Mar-15

Project: AJAX PROJECT
Test Pit No.: TP14-258
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 324
Date Started: 9 Sep 14

Location: East Embankment
Total Depth: 3.7 m
Date Completed: 9 Sep 14

Coordinates: 684,824 E , 5,607,479 N UTM NAD83 ZONE10
Elevation: 995 m
Logged by: JAG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
						TOPSOIL/ORGANICS (0 to 0.4) ORGANICS; root mat; and TOPSOIL; Sandy SILT; trace gravel; fine grained; poorly graded, dark brown, massive, loose, spongy, moist.	0 m - A: 0 - 0.4 m
						SILTY GRAVELLY SAND (0.4 to 0.6) Silty gravelly SAND; trace cobbles; fine to coarse grained; well graded, sub angular to sub rounded, light white-brown, massive, moderately dense, dry.	0.4 m - C: 0.4 - 0.6 m
1.0	994.0					**SANDY GRAVELLY SILT** (0.6 to 3.7) Sandy Gravelly SILT; trace cobbles; fine to coarse grained, sub angular to sub rounded, slightly plastic, well graded, medium greyish-brown, massive, dense, moist. [Glacial Till]	
2.0	993.0						
3.0	992.0						
4.0	991.0					End of Test Pit: 3.7 m Limit of excavator	
5.0	990.0						

GENERAL REMARKS:
Walls stable, no groundwater, easy excavation.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-258

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-259
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 9 Sep 14

Location: WMRSF
Total Depth: 4.9 m
Date Completed: 9 Sep 14

Coordinates: 684,056 E , 5,608,128 N UTM NAD83 ZONE10
Elevation: 998.9 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	998.9					**TOPSOIL/ORGANICS** (0 to 0.1) ORGANICS; root mat; and TOPSOIL; Silty SAND; trace gravel; fine to coarse grained; sub angular to sub rounded; poorly graded, dark brown, massive, loose, moist.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.5 m
						SILTY SAND (0.1 to 0.5) Silty SAND; some gravel; trace cobbles; fine to coarse grained, angular to sub rounded, non-plastic, poorly graded, medium brown, dense, dry.	0.5 m - C: 0.5 - 1.1 m
1.0	998.0					**SILTY GRAVELLY SAND** (0.5 to 4.9) Silty gravelly SAND; trace cobbles; trace clay; fine to coarse grained; angular to sub rounded, low plasticity, gap graded, dark greyish-brown, massive, very dense, moist. [Glacial Till]	
2.0	997.0						
3.0	996.0						
4.0	995.0						
5.0	994.0					End of Test Pit: 4.9 m Limit of excavator	
	993.0						

GENERAL REMARKS:
Walls stable, no groundwater, difficult to excavate from 0.5 m onwards.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-259

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-260
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 9 Sep 14

Location: EMRSF
Total Depth: 4 m
Date Completed: 9 Sep 14

Coordinates: 684,597 E , 5,607,846 N UTM NAD83 ZONE10
Elevation: 995.7 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	995.7					**TOPSOIL/ORGANICS** (0 to 0.4) ORGANICS; root mat; and TOPSOIL; Silty SAND; trace gravel; fine to coarse grained; sub angular to sub rounded; poorly graded, dark brown, massive, loose, moist.	0 m - A: 0 - 0.4 m
						SILTY SAND (0.4 to 4) Silty SAND; some gravel; some cobbles; trace boulders; fine to coarse grained, angular to sub rounded, non-plastic, well graded, medium greyish-brown, massive; moderately dense, dry. [Glacial Till]	
1.0	995.0						
1.0	994.0						
2.0							
2.0	993.0						
3.0							
3.0	992.0						
4.0						End of Test Pit: 4 m Refusal on bedrock	
4.0	991.0						
5.0							
5.0	990.0						

GENERAL REMARKS:
Walls slumping slightly, no groundwater, difficult to excavate due to boulders.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-260

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, TEST PIT LOG, 2014 KP DATA TEMPLATE REVB.GDT, 17-Mar-15

Project: AJAX PROJECT
Test Pit No.: TP14-261
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 324
Date Started: 9 Sep 14

Location: EMRSF
Total Depth: 1.6 m
Date Completed: 9 Sep 14

Coordinates: 684,401 E , 5,607,849 N UTM NAD83 ZONE10
Elevation: 1058 m
Logged by: JAG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
						TOPSOIL/ORGANICS (0 to 0.2) ORGANICS; root mat; and TOPSOIL; Sandy SILT; trace gravel; fine grained; poorly graded, dark brown, massive, loose, moist.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.4 m 0.4 m - C: 0.4 - 1.0 m
						SANDY SILT (0.2 to 0.4) Sandy SILT; trace gravel; fine grained; poorly graded, medium brown, massive, loose, dry. [Loess]	
1.0	1057.0					**SILTY SAND** (0.4 to 1) Silty SAND; some gravel; fine to coarse grained, sub angular to sub rounded, well graded, light white-brown, massive, moderately dense, dry.	
						SANDY SILT (1 to 1.6) Sandy SILT; some gravel; trace cobbles; fine to coarse grained, sub angular to sub rounded, well graded, medium greyish-brown, massive, dense, dry. [Colluvium]	
2.0	1056.0					**WEATHERED BEDROCK** (1.6) Light grey-green, massive, slightly weathered, strong, mafic volcanics End of Test Pit: 1.6 m Refusal on bedrock	
3.0	1055.0						
4.0	1054.0						
5.0	1053.0						

GENERAL REMARKS:
Walls stable, no groundwater, easy excavation.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-261

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, TEST PIT LOG, 2014 KP DATA TEMPLATE REVB.GDT, 17-Mar-15

Project: AJAX PROJECT
Test Pit No.: TP14-262
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 324
Date Started: 9 Sep 14

Location: East Embankment
Total Depth: 4 m
Date Completed: 9 Sep 14

Coordinates: 684,417 E , 5,607,410 N UTM NAD83 ZONE10
Elevation: 1032 m
Logged by: JAG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1032.0					**TOPSOIL/ORGANICS** (0 to 0.4) ORGANICS; root mat; and TOPSOIL; Sandy SILT; some gravel; fine grained; poorly graded, dark brown, massive, loose, moist.	0 m - A: 0 - 0.4 m
						SANDY SILT (0.4 to 0.5) Sandy SILT; some gravel; fine grained; poorly graded, medium brown, massive, moderately dense, dry.	0.4 m - B: 0.4 - 0.5 m 0.5 m - C: 0.5 - 1.0 m
1.0	1031.0					**SILTY GRAVELLY SAND** (0.5 to 1) Silty gravelly SAND; trace cobbles; fine to coarse grained; sub angular to sub rounded, well graded, light white-brown, massive, moderately dense, dry.	
						SILTY SAND (1 to 4) Silty SAND; some gravel; trace cobbles; fine to coarse grained, sub angular to sub rounded, well graded, medium brown, massive, dense, moist. [Reworked Glaciofluvial]	
2.0	1030.0						
3.0	1029.0						
4.0	1028.0					End of Test Pit: 4 m Limit of excavator	
5.0	1027.0						

GENERAL REMARKS:
Walls stable, no groundwater, easy excavation.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-262

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, TEST PIT LOG, 2014 KP DATA TEMPLATE REVB.GDT, 17-Mar-15

Project: AJAX PROJECT
Test Pit No.: TP14-263
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 9 Sep 14

Location: TSF Basin
Total Depth: 4.7 m
Date Completed: 9 Sep 14

Coordinates: 684,396 E , 5,607,225 N UTM NAD83 ZONE10
Elevation: 1009.4 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1009.0					**TOPSOIL/ORGANICS** (0 to 0.1) ORGANICS; root mat; and TOPSOIL; Sandy SILT; trace gravel; trace cobbles; fine to coarse grained; sub angular to rounded; poorly graded, dark brown, massive, loose.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.3 m
						SANDY SILT (0.1 to 0.3) Sandy SILT; trace gravel; trace cobbles; fine to coarse grained; sub angular to rounded; poorly graded, medium brown, moderately dense, dry. [Loess]	
1.0	1008.0					**GRAVELLY SAND** (0.3 to 4.7) Gravelly SAND; some silt; some cobbles; trace clay; fine to coarse grained; angular to sub rounded, medium plasticity, well graded, dark brown, massive, dense, moist to wet. [Glacial Till]	
2.0	1007.0						
3.0	1006.0						
4.0	1005.0	G B	TP14-263-1			End of Test Pit: 4.7 m Limit of excavator	
5.0	1004.0						

GENERAL REMARKS:
Walls stable, no groundwater, easy to excavate.

SAMPLING SYMBOLS:
G B GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-263

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, TEST PIT LOG, 2014 KP DATA TEMPLATE REVB.GDT, 17-Mar-15

Project: AJAX PROJECT
Test Pit No.: TP14-264
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 324
Date Started: 9 Sep 14

Location: TSF Basin
Total Depth: 2.9 m
Date Completed: 9 Sep 14

Coordinates: 684,229 E , 5,607,292 N UTM NAD83 ZONE10
Elevation: 1011 m
Logged by: JAG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0						**TOPSOIL/ORGANICS** (0 to 0.25) ORGANICS; root mat; and TOPSOIL; Sandy SILT; trace gravel; fine grained; poorly graded, dark brown, massive, loose, moist.	0 m - A: 0 - 0.25 m 0.25 m - B: 0.25 - 0.4 m 0.4 m - C: 0.4 - 1.0 m
						SANDY SILT (0.25 to 0.4) Sandy SILT; some gravel; some grained; poorly graded, medium brown, massive, moderately dense, dry. [Loess]	
1.0	1010.0					**GRAVELLY SILT AND SAND** (0.4 to 1) Gravelly SILT and SAND; trace cobbles; fine to coarse grained, well graded, light white-brown, massive, moderately dense, dry.	
						SANDY GRAVELLY SILT (1 to 2.9) Sandy Gravelly SILT; trace cobbles; fine to coarse grained, sub angular to sub rounded, well graded, medium brown, massive, very dense, moist. [Glacial Till]	
2.0	1009.0						
		GB	TP14-264-1				
3.0	1008.0					End of Test Pit: 2.9 m Refusal on boulders/bedrock	
4.0	1007.0						
5.0	1006.0						

GENERAL REMARKS:
Walls stable, no groundwater, difficult to excavate due to dense material.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-264

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-265
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 10 Sep 14

Location: TSF Basin
Total Depth: 4.1 m
Date Completed: 10 Sep 14

Coordinates: 684,281 E , 5,607,115 N UTM NAD83 ZONE10
Elevation: 992.1 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	992.0					**TOPSOIL/ORGANICS** (0 to 0.2) ORGANICS; root mat; and TOPSOIL; Sandy SILT; trace gravel; fine to coarse grained; sub angular to rounded; poorly graded, dark brown, massive, loose, moist.	0 m - A: 0 - 0.2 m 0.2 m - C: 0.2 - 0.5 m
						SILTY SAND (0.2 to 0.5) Silty SAND; some gravel; trace cobbles; fine to coarse grained, angular to rounded, gap graded, light to medium greyish-brown, massive, dense, dry to moist.	
1.0	991.0					**SILTY SAND** (0.5 to 4.1) Silty SAND; some gravel; trace cobbles; fine to coarse grained, angular to rounded, gap graded, dark greyish-brown, massive, very dense, moist. [Glacial Till]	
2.0	990.0						
3.0	989.0						
4.0	988.0					End of Test Pit: 4.1 m Limit of excavator	
5.0	987.0						

GENERAL REMARKS:
Walls stable, no groundwater, easy to excavate.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-265

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-266
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 324
Date Started: 10 Sep 14

Location: TSF Basin
Total Depth: 4 m
Date Completed: 10 Sep 14

Coordinates: 684,141 E , 5,606,863 N UTM NAD83 ZONE10
Elevation: 963 m
Logged by: JAG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0						**TOPSOIL/ORGANICS** (0 to 0.2) ORGANICS; root mat; and TOPSOIL; SILT; some sand; fine grained; non-plastic; poorly graded, dark brown, massive, loose, moist.	0 m - A: 0 - 0.25 m
						SILT (0.2 to 1.3) SILT; some fine sand; fine grained; non-plastic, poorly graded, medium brown, massive, moderately dense to dense, moist. 10 cm layer of calciferous sand at 0.7 m. [Loess]	
1.0	962.0						
						SAND (1.3 to 4) SAND; trace gravel; coarse grained, non-plastic, poorly graded, light brown, massive, moderately dense, moist. [Loess]	
2.0	961.0						
3.0	960.0						
		G B	TP14-266-1				
4.0	959.0					End of Test Pit: 4 m Limit of excavator	
5.0	958.0						

GENERAL REMARKS:
Walls stable, no groundwater, very easy to excavate.

SAMPLING SYMBOLS:
G B GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-266

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-267
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 10 Sep 14

Location: TSF Basin
Total Depth: 4.3 m
Date Completed: 10 Sep 14

Coordinates: 684,304 E , 5,606,953 N UTM NAD83 ZONE10
Elevation: 978.6 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	978.0					**TOPSOIL/ORGANICS** (0 to 0.1) ORGANICS; root mat; and TOPSOIL; Sandy SILT; trace gravel; fine to coarse grained; sub angular to rounded; poorly graded, dark brown, massive, loose, dry.	0 m - A: 0 - 0.1 m
						SILTY SAND (0.1 to 1.2) Silty SAND; some gravel; trace cobbles; fine to coarse grained, angular to sub rounded, well graded, dark to medium brown, massive, dense, dry.	
1.0							
	977.0					**SILTY SAND** (1.2 to 4.3) Silty SAND; some gravel; some cobbles; fine to coarse grained, angular to sub rounded, well graded, dark brown, massive, dense, moist. [Glacial Till]	
2.0							
	976.0						
3.0							
	975.0						
4.0		G B	TP14-267-1				
	974.0					End of Test Pit: 4.3 m Limit of excavator	
5.0							
	973.0						

GENERAL REMARKS:
Walls stable, no groundwater, easy to excavate.

SAMPLING SYMBOLS:
G B GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-267

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-268
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 324
Date Started: 10 Sep 14

Location: TSF Basin
Total Depth: 2.8 m
Date Completed: 10 Sep 14

Coordinates: 684,109 E , 5,606,975 N UTM NAD83 ZONE10
Elevation: 964 m
Logged by: JAG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	964.0					**TOPSOIL/ORGANICS** (0 to 0.5) ORGANICS; root mat; and TOPSOIL; Silty SAND; fine grained; non-plastic; poorly graded, dark brown, massive, loose, moist.	0 m - A: 0 - 0.05 m
1.0	963.0					**SILTY SAND** (0.5 to 2.8) Silty SAND; some medium sand; fine grained, non-plastic, poorly graded, medium brown, massive, moderately dense, moist. [Loess]	
2.0	962.0						
3.0	961.0					End of Test Pit: 2.8 m Decommisioned water pipe encountered	
4.0	960.0						
5.0	959.0						

GENERAL REMARKS:
Walls stable, no groundwater, old black pipe in way of excavation (not in use).

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-268

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-269
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 10 Sep 14

Location: TSF Basin
Total Depth: 4.8 m
Date Completed: 10 Sep 14

Coordinates: 684,401 E , 5,606,729 N UTM NAD83 ZONE10
Elevation: 970.5 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	970.0					**TOPSOIL/ORGANICS** (0 to 0.1) ORGANICS; root mat; and TOPSOIL; Sandy SILT; trace gravel; fine to coarse grained; sub angular to rounded; poorly graded, dark brown, massive, loose, moist.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.4 m
						SANDY SILT (0.1 to 0.4) Sandy SILT; trace gravel; fine to coarse grained; sub angular to rounded; poorly graded, dark brown, massive, loose, moist. [Loess]	
1.0	969.0					**SILT AND SAND** (0.4 to 4.5) SILT and SAND; trace gravel; trace cobbles; fine grained, non-plastic, poorly graded, light greyish brown, massive, loose to moderately dense, dry. [Glacial Till]	
2.0	968.0						
3.0	967.0						
4.0	966.0					**SILTY SAND** (4.5 to 4.8) Silty SAND; some gravel; trace cobbles; fine to coarse grained, angular to sub rounded, low plasticity; well graded, medium greyish-brown, massive, dense, moist. [Glacial Till]	
5.0	965.0					End of Test Pit: 4.8 m Limit of excavator	

GENERAL REMARKS:
Walls stable, no groundwater, very easy to excavate.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-269

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-270
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 10 Sep 14

Location: TSF Basin
Total Depth: 4.6 m
Date Completed: 10 Sep 14

Coordinates: 683,844 E , 5,606,999 N UTM NAD83 ZONE10
Elevation: 962 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
						TOPSOIL/ORGANICS (0 to 0.3) ORGANICS; root mat; and TOPSOIL; Sandy SILT; some gravel; fine grained; poorly graded, dark brown, massive, moderately dense, moist.	0 m - A: 0 - 0.3 m
						SAND (0.3 to 0.6) SAND; medium grained, poorly graded, medium brown, massive, moderately dense, moist. [Loess]	
1.0	961.0					**SAND** (0.6 to 1.3) SAND; fine to medium, poorly graded, light to medium brown, massive, moderately dense, moist. [Loess]	
						SAND (1.3 to 4.6) SAND, medium grained, some find sand; poorly graded, light to medium brown, massive, moderately dense, moist. [Loess]	
2.0	960.0						
3.0	959.0						
4.0	958.0	GB	TP14-270-1			End of Test Pit: 4.6 m Limit of excavator	
5.0	957.0						

GENERAL REMARKS:
Walls stable, no groundwater, very easy excavation.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-270

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-271
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 10 Sep 14

Location: TSF Basin
Total Depth: 2.5 m
Date Completed: 10 Sep 14

Coordinates: 684,582 E , 5,607,048 N UTM NAD83 ZONE10
Elevation: 1008.4 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1008.0					**TOPSOIL/ORGANICS** (0 to 0.2) ORGANICS; root mat; and TOPSOIL; Sandy SILT; trace gravel; fine to coarse grained; sub angular to rounded; poorly graded, dark brown, massive, loose, moist.	0 m - A: 0 - 0.2 m
						GRAVELLY SAND (0.2 to 2.5) Gravelly SAND; some silt; some cobbles; fine to coarse grained, sub angular to rounded, non-plastic, well graded, medium greyish-brown, massive, dense to very dense, dry to moist. [Reworked Glaciofluvial]	
1.0	1007.0						
2.0	1006.0					End of Test Pit: 2.5 m Refusal on boulders/bedrock	
3.0	1005.0						
4.0	1004.0						
5.0	1003.0						

GENERAL REMARKS:
Walls stable, no groundwater, difficult to excavate.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-271

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-272
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 324
Date Started: 10 Sep 14

Location: TSF Basin
Total Depth: 4.5 m
Date Completed: 10 Sep 14

Coordinates: 683,936 E , 5,606,870 N UTM NAD83 ZONE10
Elevation: 977 m
Logged by: JAG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
						TOPSOIL/ORGANICS (0 to 0.4) ORGANICS; root mat; and TOPSOIL; Sandy SILT; trace gravel; fine grained; poorly graded, dark brown, massive, loose, spongy, moist.	0 m - A: 0 - 0.4 m
						SANDY SILT (0.4 to 1) Sandy SILT; trace gravel; trace cobbles; fine grained; gap graded, medium brown, massive, moderately dense, dry.	0.4 m - B: 0.4 - 1.0 m
1.0	976.0					**SILTY GRAVELLY SAND** (1 to 1.3) Silty gravelly SAND; trace cobbles; fine to coarse grained; sub angular to sub rounded, well graded, light white-brown, massive, dense, dry.	1 m - C: 1.0 - 1.3 m
						SANDY GRAVELLY SILT (1.3 to 4.5) Sandy Gravelly SILT; trace cobbles; fine to coarse grained, sub angular to sub rounded, low plasticity, well graded, medium brown, massive, dense, moist. [Reworked Glaciofluvial]	
2.0	975.0						
3.0	974.0						
4.0	973.0						
						End of Test Pit: 4.5 m Refusal on boulders/bedrock	
5.0	972.0						

GENERAL REMARKS:
Walls stable, no groundwater, difficult to excavate from 1.5 m onwards.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-272

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-273
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 10 Sep 14

Location: TSF Basin
Total Depth: 3.9 m
Date Completed: 10 Sep 14

Coordinates: 684,571 E , 5,606,838 N UTM NAD83 ZONE10
Elevation: 983.5 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	983.0					**TOPSOIL/ORGANICS** (0 to 0.1) ORGANICS; root mat; and TOPSOIL; Sandy SILT; trace gravel; fine to coarse grained; sub angular to rounded; poorly graded, dark brown, massive, loose, moist.	0 m - A: 0 - 0.1 m
1.0	982.0					**SAND** (0.1 to 3.9) SAND; some silt; some gravel; trace cobbles; fine to coarse grained, sub angular to sub rounded, non-plastic, well graded, medium brown (getting darker with depth), massive, moderately dense to dense, dry. [Loess]	
2.0	981.0						
3.0	980.0						
4.0	979.0					End of Test Pit: 3.9 m Refusal on boulders/bedrock	
5.0	978.0						

GENERAL REMARKS:
Walls stable, no groundwater, easy to excavate to 1.5 m.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-273

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-274
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 324
Date Started: 10 Sep 14

Location: TSF Basin
Total Depth: 4.8 m
Date Completed: 10 Sep 14

Coordinates: 683,826 E , 5,607,235 N UTM NAD83 ZONE10
Elevation: 963 m
Logged by: JAG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	963.0					**TOPSOIL/ORGANICS** (0 to 0.3) ORGANICS; root mat; and TOPSOIL; Sandy SILT; trace gravel; fine to coarse grained; sub angular to rounded; poorly graded, dark brown, massive, loose, moist.	0 m - A: 0 - 0.3 m 0.3 m - C: 0.3 - 0.6 m
						SILTY GRAVELLY SAND (0.3 to 0.6) Silty gravelly SAND; trace cobbles; fine to coarse grained, sub angular to sub rounded, non-plastic, well graded, white to brown, massive, moderately dense, massive, dry.	
1.0	962.0					**SANDY SILT** (0.6 to 4.8) Sandy SILT; some gravel; trace cobbles; fine to coarse grained, sub angular to sub rounded, non-plastic, well graded, medium brown (getting darker with depth), massive, moderately dense to dense, dry. [Glacial Till]	
2.0	961.0						
3.0	960.0						
4.0	959.0						
4.8	958.2					End of Test Pit: 4.8 m Limit of excavator	
5.0	958.0						

GENERAL REMARKS:
Walls stable, no groundwater, easy excavation.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-274

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-275
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 10 Sep 14

Location: TSF Basin
Total Depth: 2.5 m
Date Completed: 10 Sep 14

Coordinates: 684,542 E , 5,606,663 N UTM NAD83 ZONE10
Elevation: 986.5 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	986.0					**TOPSOIL/ORGANICS** (0 to 0.1) ORGANICS; root mat; and TOPSOIL; SILT; some sand; trace gravel; fine grained; sub angular to rounded; poorly graded, dark brown, massive, loose, dry.	0 m - A: 0 - 0.1 m
1.0	985.0					**SANDY SILT** (0.1 to 2.5) Sandy SILT; trace gravel; trace cobbles; fine to coarse grained; sub angular to rounded; gap graded, light greyish-brown, massive, moderately dense to dense, dry. [Loess]	
2.0	984.0					**WEATHERED BEDROCK** (2.5) Light grey-green, massive, slightly weathered, strong, mafic volcanics End of Test Pit: 2.5 m Refusal on bedrock	
3.0	983.0						
4.0	982.0						
5.0	981.0						

GENERAL REMARKS:
Walls stable, no groundwater, very easy to excavate to 2.5 m.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-275

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-276
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 11 Sep 14

Location: TSF Basin
Total Depth: 4.8 m
Date Completed: 11 Sep 14

Coordinates: 683,447 E , 5,606,876 N UTM NAD83 ZONE10
Elevation: 962.1 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	962.0					**TOPSOIL/ORGANICS** (0 to 0.2) ORGANICS; root mat; and TOPSOIL; SILT; some sand; trace gravel; fine grained; sub angular to rounded; poorly graded, dark brown, massive, loose, dry.	0 m - A: 0 - 0.2 m (in hayfield)
						SILT (0.2 to 1.3) SILT; some sand; trace gravel; fine grained; non-plastic, poorly graded, light greyish-brown, blocky/layered, moderately dense to dense, dry. [Loess]	
1.0	961.0	G B	GP14-011				
						SILTY SAND (1.3 to 4.8) Silty SAND; some gravel; some cobbles; trace boulders; fine to coarse grained, sub angular to rounded, non-plastic; gap graded, medium brown, massive, moderately dense, moist. [Glacial Till]	
2.0	960.0						
3.0	959.0						
4.0	958.0						
		G B	TP14-276-1				
5.0	957.0					End of Test Pit: 4.8 m Limit of excavator	

GENERAL REMARKS:
Walls stable, no groundwater, easy to excavate to 1.5 m.

SAMPLING SYMBOLS:
G B GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-276

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-277
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 11 Sep 14

Location: TSF Basin
Total Depth: 4.2 m
Date Completed: 11 Sep 14

Coordinates: 683,442 E , 5,606,494 N UTM NAD83 ZONE10
Elevation: 1008.3 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1008.0					**TOPSOIL/ORGANICS** (0 to 0.4) ORGANICS; root mat; and TOPSOIL; Sandy SILT; trace gravel; fine to coarse grained; sub angular to rounded; poorly graded, dark brown, massive, loose, moist.	0 m - A: 0 - 0.4 m
						GRAVELLY SAND (0.4 to 4.2) Gravelly SAND; some silt; some cobbles; fine to coarse grained, sub angular to sub rounded, low plasticity, well graded, dark greyish-brown, massive, dense, moist. [Reworked Glaciofluvial]	
1.0	1007.0	G B	GP14-013				
2.0	1006.0						
3.0	1005.0						
4.0	1004.0					End of Test Pit: 4.2 m Limit of excavator	
5.0	1003.0	G B	TP14-277-1				

GENERAL REMARKS:
Walls stable, no groundwater, easy to excavate.

SAMPLING SYMBOLS:
G B GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-277

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-278
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 11 Sep 14

Location: Haul / Access Roads
Total Depth: 3.5 m
Date Completed: 11 Sep 14

Coordinates: 685,434 E , 5,609,309 N UTM NAD83 ZONE10
Elevation: 883 m
Logged by: JAG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	883.0					**TOPSOIL/ORGANICS** (0 to 0.3) ORGANICS; root mat; and TOPSOIL; SILT; some sand; trace gravel; fine grained; poorly graded, dark brown, massive, loose, moist.	0 m - A: 0 - 0.3 m 0.3 m - B: 0.3 - 0.4 m 0.4 m - C: 0.4 - 0.6 m
						SILT (0.3 to 0.4) SILT; some sand; trace gravel; fine grained; poorly graded, medium brown, massive, moderately dense, dry. [Loess]	
1.0	882.0					**SILT** (0.4 to 0.6) SILT; some sand; trace gravel; fine grained; poorly graded, light white-brown, massive, moderately dense, dry. [Loess]	
						SILTY SAND (0.6 to 1) Silty; fine SAND; trace gravel; fine grained, poorly graded, medium brown, massive, moderately dense, dry. [Glaciofluvial]	
						SAND AND GRAVEL (1 to 1.5) SAND and GRAVEL; some silt; coarse grained, well graded, medium greyish-brown, massive, moderately dense, moist. [Glaciofluvial]	
2.0	881.0					**SILTY SAND** (1.5 to 2.3) Silty SAND; poorly graded, medium brown, massive, moderately dense, moist. [Glaciofluvial]	
						SAND AND GRAVEL (2.3 to 3.5) SAND and GRAVEL; some silt; some cobbles; fine to coarse grained, well graded, medium greyish-brown, stratified moderately dense, moist. [Glaciofluvial]	
3.0	880.0						
						End of Test Pit: 3.5 m Limit of excavator	
4.0	879.0						
5.0	878.0						

GENERAL REMARKS:
Walls sloughing, no groundwater, difficult to excavate due to wall stability.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-278

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-279
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 11 Sep 14

Location: Haul / Access Roads
Total Depth: 4 m
Date Completed: 11 Sep 14

Coordinates: 685,295 E , 5,609,230 N UTM NAD83 ZONE10
Elevation: 898 m
Logged by: JAG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
						TOPSOIL/ORGANICS (0 to 0.2) ORGANICS; root mat; and TOPSOIL; SILT; some sand; trace gravel; fine grained; poorly graded, dark brown, massive, loose, dry.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.3 m 0.3 m - C: 0.3 - 0.8 m
						SILTY GRAVELLY SAND (0.2 to 0.3) Silty GRAVEL; some sand; fine to coarse grained; sub angular to sub rounded, well graded, medium brown, massive, moderately dense, dry.	
1.0	897.0					**SILTY GRAVELLY SAND** (0.3 to 4) Silty GRAVEL; some sand; fine to coarse grained; sub angular to sub rounded, well graded, light white-brown, massive, moderately dense, dry. [Colluvium]	
2.0	896.0						
3.0	895.0						
4.0	894.0					**WEATHERED BEDROCK** (4) Light grey-green, massive, slightly weathered, strong, mafic volcanics End of Test Pit: 4 m Refusal on weathered bedrock	
5.0	893.0						

GENERAL REMARKS:
Walls stable, no groundwater, easy excavation.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-279

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-280
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 11 Sep 14

Location: Central Collection Pond
Total Depth: 2.8 m
Date Completed: 11 Sep 14

Coordinates: 685,090 E , 5,609,191 N UTM NAD83 ZONE10
Elevation: 898 m
Logged by: JAG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0						**TOPSOIL/ORGANICS** (0 to 0.1) ORGANICS; root mat; and TOPSOIL; SILT; some sand; trace gravel; fine grained; poorly graded, medium to dark brown, massive, loose, dry.	0 m - A: 0 - 0.1 m
						SANDY SILT (0.1 to 1.1) Sandy SILT; trace gravel; fine grained; poorly graded, medium brown, massive, moderately dense, dry.	
1.0	897.0					**SILTY SAND** (1.1 to 2.4) Silty SAND; some gravel; poorly graded, sub angular to sub rounded, medium brown, massive, moderately dense, dry. [Loess]	
2.0	896.0					**WEATHERED BEDROCK** (2.4 to 2.8) Light grey-green, massive, highly weathered, weak, mafic volcanics	
3.0	895.0					End of Test Pit: 2.8 m Refusal on weathered bedrock	
4.0	894.0						
5.0	893.0						

GENERAL REMARKS:
Walls stable, no groundwater, easy excavation.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-280

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-281
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 11 Sep 14

Location: Central Collection Pond
Total Depth: 4.2 m
Date Completed: 11 Sep 14

Coordinates: 685,088 E , 5,609,033 N UTM NAD83 ZONE10
Elevation: 885 m
Logged by: JAG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
						TOPSOIL/ORGANICS (0 to 0.2) ORGANICS; root mat; and TOPSOIL; SILT; some sand; trace gravel; fine grained; poorly graded, dark brown, massive, loose, spongy, moist.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.4 m
						SILT (0.2 to 0.4) SILT; some sand; trace gravel; fine grained; poorly graded, medium brown, massive, moderately dense, dry. [Loess]	
1.0	884.0					**SILTY SAND AND GRAVEL** (0.4 to 1.1) Silty SAND and GRAVEL; some cobbles; trace boulders; fine to coarse grained, sub angular to sub rounded, well graded, light white-brown, massive, moderately dense, dry.	
						SILT AND SAND (1.1 to 4.2) SILT and fine SAND; some gravel; trace cobbles; trace boulders; fine to coarse grained; well graded, medium greyish-brown, massive, very dense, moist. [Glacial Till]	
2.0	883.0						
3.0	882.0						
4.0	881.0	G B	TP14-281-1			End of Test Pit: 4.2 m Limit of excavator	
5.0	880.0						

GENERAL REMARKS:
No groundwater, possible waste rock at 0.5 m.

SAMPLING SYMBOLS:
G B GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-281

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-282
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 11 Sep 14

Location: Central Collection Pond
Total Depth: 4.6 m
Date Completed: 11 Sep 14

Coordinates: 684,880 E , 5,609,026 N UTM NAD83 ZONE10
Elevation: 895 m
Logged by: JAG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0						**TOPSOIL/ORGANICS** (0 to 0.2) ORGANICS; root mat; and TOPSOIL; SILT; some sand; trace gravel; fine grained; poorly graded, dark brown, massive, loose, dry.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.3 m 0.3 m - C: 0.3 - 1.1 m
						SILT (0.2 to 0.3) SILT; some sand; trace gravel; fine grained; poorly graded, medium brown, massive, moderately dense, dry. [Loess]	
1.0	894.0					**SILTY GRAVELLY SAND** (0.3 to 1.1) Gravelly SILT and SAND; fine to coarse grained; sub angular to sub rounded, well graded, light white-brown, massive, moderately dense, dry.	
						SILT AND SAND (1.1 to 4.6) SILT and fine SAND; some gravel; trace cobbles; trace boulders; fine to coarse grained; sub angular to sub rounded, well graded, medium greyish-brown, massive, very dense, moist. [Glacial Till]	
2.0	893.0						
3.0	892.0						
4.0	891.0						
						End of Test Pit: 4.6 m Limit of excavator	
5.0	890.0						

GENERAL REMARKS:
Walls stable, no groundwater, easy excavation.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-282

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-283
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 12 Sep 14

Location: Haul / Access Roads
Total Depth: 4.4 m
Date Completed: 12 Sep 14

Coordinates: 684,765 E , 5,609,065 N UTM NAD83 ZONE10
Elevation: 891 m
Logged by: JAG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0						**TOPSOIL/ORGANICS** (0 to 0.1) ORGANICS; root mat; and TOPSOIL; sandy SILT; trace gravel; fine grained; poorly graded, medium to dark brown, massive, loose, dry.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.3 m 0.3 m - C: 0.3 - 0.6 m
						SANDY SILT (0.1 to 0.3) Sandy SILT; trace gravel; fine grained; poorly graded, medium brown, massive, moderately dense, dry.	
1.0	890.0					**SILTY GRAVELLY SAND** (0.3 to 0.6) Silty gravelly SAND; fine to coarse grained; sub angular to sub rounded, well graded, light greyish-brown, massive, moderately dense, dry.	
						SILTY GRAVELLY SAND (0.6 to 3.2) Gravelly SILT and SAND; some cobbles; fine to coarse grained; angular to sub rounded, well graded, medium brown, massive, dense, moist. [Glacial Till]	
2.0	889.0						
3.0	888.0						
						GRAVELLY SAND (3.2 to 4.4) Gravelly SAND; some silt; some cobbles; fine to coarse grained; sub angular to rounded, well graded, medium brown, massive, dense, moist. [Glacial Till]	
4.0	887.0	GB	TP14-283-1				
						End of Test Pit: 4.4 m Limit of excavator	
5.0	886.0						

GENERAL REMARKS:
Walls stable, no groundwater, difficult to excavate due to dense material.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-283

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-284
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 12 Sep 14

Location: TSF Basin
Total Depth: 5.3 m
Date Completed: 12 Sep 14

Coordinates: 682,684 E , 5,607,530 N UTM NAD83 ZONE10
Elevation: 958.2 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	958.0					**TOPSOIL/ORGANICS** (0 to 0.1) ORGANICS; root mat; and TOPSOIL; SILT; some sand; trace gravel; fine grained; sub angular to rounded; poorly graded, medium brown, massive, loose, moist.	0 m - A: 0 - 0.1 m
		G B	GP14-014			**SAND** (0.1 to 0.8) SAND; some silt; some gravel; trace cobbles; fine to coarse grained, angular to sub rounded, non-plastic, poorly graded, medium grey, massive, dense, moist. [Loess]	
1.0	957.0					**SILT** (0.8 to 5.3) SILT; some sand; trace gravel; trace cobbles; fine grained, non-plastic, poorly graded, light grey to light brown, stratified, dense, dry to moist. [Loess]	
2.0	956.0						
3.0	955.0						
4.0	954.0						
5.0	953.0	G B	TP14-285-1			End of Test Pit: 5.3 m Limit of excavator	

GENERAL REMARKS:
GP14-014, walls stable, no groundwater, very easy to excavate.

SAMPLING SYMBOLS:
G B GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-284

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-285
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 12 Sep 14

Location: North Embankment
Total Depth: 5.5 m
Date Completed: 12 Sep 14

Coordinates: 682,762 E , 5,608,050 N UTM NAD83 ZONE10
Elevation: 968.2 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	968.0					**TOPSOIL/ORGANICS** (0 to 0.1) ORGANICS; root mat; and TOPSOIL; SILT; some sand; trace gravel; fine grained; sub angular to rounded; poorly graded, massive, loose, dry.	0 m - Disturbed Material at Surface
						SAND (0.1 to 1) SAND; some gravel; some cobbles; fine to coarse grained, angular to sub rounded, non-plastic, gap graded, dark to medium grey, massive, dense, dry. [Loess]	
1.0	967.0					**SILT** (1 to 5.5) SILT; some sand; trace gravel; trace cobbles; fine grained, angular to sub rounded, non-plastic, poorly graded, light grey to light brown, stratified, dense, dry. [Loess]	
2.0	966.0						
3.0	965.0						
4.0	964.0						
5.0	963.0						
		GB	Proctor-TP-285			End of Test Pit: 5.5 m Limit of excavator	

GENERAL REMARKS:
Walls stable, no groundwater, very easy to excavate.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-285

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-286
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 15 Oct 14

Location: SMRSF
Total Depth: 3.8 m
Date Completed: 15 Oct 14

Coordinates: 685,264 E , 5,607,701 N UTM NAD83 ZONE10
Elevation: 1012.2 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1012.0					**TOPSOIL & ORGANICS** (0 to 0.3) ORGANICS, root inclusions; and TOPSOIL; Sandy; SILT, trace gravel, fine to coarse grained; subrounded to angular, poorly graded, medium brown, non plastic, loose, dry.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.3 m
						SILTY SAND (0.3 to 1) Silty SAND; trace gravel; trace cobbles, fine to coarse grained, subrounded to angular, poorly graded, light greyish brown, dense, dry, massive.	
1.0	1011.0					**GRAVELLY SANDY SILT** (1 to 3.8) Gravelly sandy SILT; trace cobbles, fine to coarse grained, angular to rounded, gap graded, light to medium greyish brown, non plastic, very dense, dry. [Glacial Till]	
2.0	1010.0						
3.0	1009.0						
3.8	1008.4					End of Test Pit: 3.8 m Refusal on dense material	
4.0	1008.0						
5.0	1007.0						

GENERAL REMARKS:
Bedrock outcrops nearby, difficult to excavate, no groundwater, walls stable.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-286

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-287
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 15 Oct 14

Location: SMRSF
Total Depth: 3.7 m
Date Completed: 15 Oct 14

Coordinates: 685,213 E , 5,607,414 N UTM NAD83 ZONE10
Elevation: 996.8 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	996.8					**TOPSOIL & ORGANICS** (0 to 0.2) ORGANICS, root inclusions; and TOPSOIL; Sandy; SILT, trace gravel, fine to coarse grained; subrounded to angular, poorly graded, light greyish brown, non plastic, loose, dry.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.2 m 0.2 m - C: 0.2 - 0.3 m
						SILTY SAND (0.2 to 0.6) Silty SAND; trace gravel; trace cobbles, fine to coarse grained, subrounded to angular, poorly graded, light greyish brown, dense, dry. [Loess]	
1.0	996.0					**GRAVELLY SANDY SILT** (0.6 to 3.7) Gravelly Sandy SILT; some cobbles, fine to coarse grained, angular to subrounded, gap graded, medium greyish brown, low to no plasticity, very dense, moist. [Glacial Till]	
2.0	995.0						
3.0	994.0						
4.0	993.0					End of Test Pit: 3.7 m Refusal on dense material	
5.0	992.0						
	991.0						

GENERAL REMARKS:
Difficult to excavate after 2 m, no groundwater, walls stable.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-287

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-288
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 15 Oct 14

Location: SMRSF
Total Depth: 2 m
Date Completed: 15 Oct 14

Coordinates: 685,479 E , 5,607,567 N UTM NAD83 ZONE10
Elevation: 1024.8 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1024.8					**TOPSOIL & ORGANICS** (0 to 0.3) ORGANICS, root inclusions; and TOPSOIL; Sandy; SILT, trace gravel, fine to coarse grained; rounded to angular, poorly graded, medium brown, non plastic, loose, dry.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.3 m 0.3 m - C: 0.3 - 0.4 m
						SILTY SAND (0.3 to 1) Silty SAND; some gravel; trace cobbles; fine to coarse grained, angular to subrounded, well graded, medium greyish brown, non plastic, dense, dry, massive. [Loess]	
1.0	1024.0					**GRAVELLY SANDY SILT** (1 to 2) gravelly sandy SILT; trace cobbles, fine to coarse grained, medium greyish brown, very dense, moist, massive. [Glacial Till]	
2.0	1023.0					End of Test Pit: 2 m Refusal on dense material	
3.0	1022.0						
4.0	1021.0						
5.0	1020.0						
	1019.0						

GENERAL REMARKS:
Difficult to excavate after 1.5 m, no groundwater, walls stable.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-288

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-289
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 15 Oct 14

Location: SMRSF
Total Depth: 3.4 m
Date Completed: 15 Oct 14

Coordinates: 685,853 E , 5,607,397 N UTM NAD83 ZONE10
Elevation: 1015.8 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1015.0					**TOPSOIL & ORGANICS** (0 to 0.4) ORGANICS, root inclusions; and TOPSOIL; SILT; some sand; trace gravel, fine to coarse grained; rounded to subangular, poorly graded, dark brown, non plastic, loose, dry to moist.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.4 m
1.0						**SILTY SAND** (0.4 to 1.1) Silty SAND; trace gravel; trace cobbles; fine grained, light greyish brown, non plastic, loose, dry, massive.	
	1014.0					**GRAVELLY SANDY SILT** (1.1 to 3.4) Gravelly Sandy SILT; trace cobbles, fine to coarse grained, angular to subrounded, gap graded, medium greyish brown, low to no plasticity, very dense, moist, massive. [Glacial Till]	
2.0							
	1013.0						
3.0		G B	TP14-289-1				
						End of Test Pit: 3.4 m Refusal on dense material	
	1012.0						
4.0							
	1011.0						
5.0							
	1010.0						

GENERAL REMARKS:
Relatively easy to excavate, no groundwater, walls sloughing from 0 - 0.4 m.

SAMPLING SYMBOLS:
G B GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-289

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-290
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 15 Oct 14

Location: SMRSF
Total Depth: 4.1 m
Date Completed: 15 Oct 14

Coordinates: 685,795 E , 5,607,202 N UTM NAD83 ZONE10
Elevation: 991.7 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	991.7					**TOPSOIL & ORGANICS** (0 to 0.1) ORGANICS, root inclusions; and TOPSOIL; SILT; some sand; trace gravel, fine grained; subrounded to angular, poorly graded, dark brown, loose, dry.	0 m - A: 0 - 0.1 m
						SAND AND SILT (0.1 to 0.9) SILT and SAND; trace cobbles; trace gravel; fine to medium grained, poorly graded, medium brown, non plastic, cohesive, loose, dry, massive.	
1.0	991.0					**GRAVELLY SANDY SILT** (0.9 to 4.1) Gravelly Sandy SILT; trace cobbles, fine to coarse grained, angular to subrounded, gap graded, medium to dark brownish grey, low to medium plasticity, very dense, moist, massive. [Glacial Till]	
2.0	990.0						
3.0	989.0						
4.0	988.0					End of Test Pit: 4.1 m Limit of excavator	
5.0	987.0						
	986.0						

GENERAL REMARKS:
Very easy to excavate 0 - 0.9 m, then difficult, no groundwater, walls stable.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-290

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-291
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 15 Oct 14

Location: SMRSF
Total Depth: 2.8 m
Date Completed: 15 Oct 14

Coordinates: 686,004 E , 5,607,052 N UTM NAD83 ZONE10
Elevation: 980.5 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	980.0					**TOPSOIL & ORGANICS** (0 to 0.1) ORGANICS, root inclusions; and TOPSOIL; silty; SAND; trace gravel, fine grained, poorly graded, very dark brown/black, non plastic, loose, moist.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.3 m 0.3 m - C: 0.3 - 0.6 m
						SILTY SAND (0.1 to 0.3) Silty SAND; some gravel; some cobbles; fine grained, poorly graded, medium orangey brown, compact, moist.	
1.0						**COBBLES AND SILT** (0.3 to 0.6) COBBLES and SILT; some sand, trace gravel, fine to coarse grained, rounded, gap graded, light greyish brown, non plastic, compact, dry. [Fill ?]	
	979.0					**SILTY SAND** (0.6 to 2.8) Silty SAND; trace gravel, fine grained, poorly graded, medium brown, non plastic, compact to loose, dry, massive. [Loess]	
2.0							
	978.0						
3.0						End of Test Pit: 2.8 m Refusal on bedrock	
	977.0						
4.0							
	976.0						
5.0							
	975.0						

GENERAL REMARKS:
Very easy to excavate (same sand material at TP14-290), no groundwater, walls stable.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-291

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Contractor: Cobra Contracting Ltd.
Location: SMRSF
Coordinates: 685,559 E , 5,607,117 N UTM NAD83 ZONE10

Test Pit No.: TP14-292
Equipment Used: CAT 320D L
Total Depth: 1.8 m
Elevation: 992.4 m

Page: 1 of 1
Date Started: 16 Oct 14
Date Completed: 16 Oct 14
Logged by: MAP
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	992.0					**TOPSOIL & ORGANICS** (0 to 0.2) ORGANICS, root inclusions; and TOPSOIL; SILT; some sand; trace gravel, fine to coarse grained; rounded to angular, poorly graded, dark brown, non plastic, loose, dry.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.2 m
						GRAVELLY SILTY SAND (0.2 to 1.8) Gravelly Silty SAND; trace cobbles; fine to coarse grained, angular to subrounded, poorly graded, medium brown, non plastic, dense, dry, massive. [Glacial Till]	
1.0	991.0						
2.0	990.0					End of Test Pit: 1.8 m Refusal on bedrock	
3.0	989.0						
4.0	988.0						
5.0	987.0						

GENERAL REMARKS:
Difficult to excavate, no groundwater, walls stable.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-292

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-293
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 16 Oct 14

Location: SMRSF
Total Depth: 4.7 m
Date Completed: 16 Oct 14

Coordinates: 685,460 E , 5,607,272 N UTM NAD83 ZONE10
Elevation: 1004.1 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1004.0					**TOPSOIL & ORGANICS** (0 to 0.4) ORGANICS, root inclusions; and TOPSOIL; SILT; some sand; trace cobbles; trace gravel, fine to coarse grained, rounded, poorly graded, medium to dark brown, non plastic, loose, dry.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.4 m
						SANDY GRAVEL (0.4 to 1.5) Sandy GRAVEL; some silt; some cobbles; fine to coarse grained, angular to rounded, well graded, loose to compact, light brownish grey, non plastic, dry, massive.	
1.0	1003.0						
						GRAVELLY SILT (1.5 to 4.7) gravelly SILT; some sand; trace cobbles; trace clay, fine grained, gap graded, angular to subrounded, dark greyish brown, low to medium plasticity, very dense, moist, massive. [Glacial Till]	
2.0	1002.0						
3.0	1001.0						
4.0	1000.0						
						End of Test Pit: 4.7 m Limit of excavator	
5.0	999.0						

GENERAL REMARKS:
Easy to excavate up to 3 m, walls sloughing from 0 - 1.5 m, no groundwater.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-293

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Contractor: Cobra Contracting Ltd.
Location: East Embankment - East Abutment
Coordinates: 685,340 E , 5,606,888 N UTM NAD83 ZONE10

Test Pit No.: TP14-294
Equipment Used: CAT 320D L
Total Depth: 1.9 m
Elevation: 1041.3 m

Page: 1 of 1
Date Started: 16 Oct 14
Date Completed: 16 Oct 14
Logged by: MAP
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1041.0					**TOPSOIL & ORGANICS** (0 to 0.5) ORGANICS, root inclusions; and TOPSOIL; Sandy; SILT, trace gravel, fine grained; rounded to subangular, poorly graded, dark brown, non plastic, loose, dry.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.3 m
1.0	1040.0					**SILTY SAND** (0.5 to 1.9) Silty SAND; some gravel; trace cobbles, fine to coarse grained, angular to subrounded, gap graded, light grey, non plastic, dense, dry, massive. [Colluvium]	
2.0	1039.0					End of Test Pit: 1.9 m Refusal on bedrock	
3.0	1038.0						
4.0	1037.0						
5.0	1036.0						

GENERAL REMARKS:
Bedrock outcrops nearby, easy to excavate, no groundwater, walls stable.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-294

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-295
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 16 Oct 14

Location: Tailings and Reclaim Pipeline Corridor
Total Depth: 2.8 m
Date Completed: 16 Oct 14

Coordinates: 685,378 E , 5,606,425 N UTM NAD83 ZONE10
Elevation: 1078.4 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1078.0					**TOPSOIL & ORGANICS** (0 to 0.2) ORGANICS, root inclusions; and TOPSOIL; SILT; some sand; trace gravel, fine to coarse grained; rounded to subangular, poorly graded, medium to dark brown, non plastic, loose, dry.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.2 m 0.2 m - C: 0.2 - 0.9 m
						SANDY GRAVEL (0.2 to 0.9) Sandy GRAVEL; some silt; some cobbles; fine to coarse grained, subangular to rounded, well graded, light grey, non plastic, loose, dry.	
1.0	1077.0					**GRAVELLY SILT** (0.9 to 2.8) gravelly SILT; some sand; trace boulders; trace cobbles; trace clay, fine to coarse grained, gap graded, angular to rounded, medium to dark greyish brown, low plasticity, very dense, moist, massive. [Glacial Till]	
2.0	1076.0	G B	TP14-295-1				
3.0	1075.0					End of Test Pit: 2.8 m Refusal on dense material	
4.0	1074.0						
5.0	1073.0						

GENERAL REMARKS:
Very difficult to excavate after 1 m, no groundwater, walls stable.

SAMPLING SYMBOLS:
G B GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-295

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT | **Test Pit No.:** TP14-296 | **Page:** 1 of 1

Contractor: Cobra Contracting Ltd. | Equipment Used: CAT 320D L | Date Started: 16 Oct 14

Location: Tailings and Reclaim Pipeline Corridor | Total Depth: 4.1 m | Date Completed: 16 Oct 14

Coordinates: 685,446 E , 5,606,231 N UTM NAD83 ZONE10 | Elevation: 1065.8 m | Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1065.0					**TOPSOIL & ORGANICS** (0 to 0.3) ORGANICS, root inclusions; and TOPSOIL; SILT; some sand; trace gravel, fine to coarse grained; rounded to subangular, poorly graded, medium brown, non plastic, loose, dry., massive.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.3 m 0.3 m - C: 0.3 - 0.7 m
						GRAVELLY SAND (0.3 to 0.7) Gravelly SAND; some silt; trace cobbles, fine to coarse grained, angular to subrounded, well graded, light to medium greyish brown, loose, dry.	
1.0						**GRAVELLY SILT** (0.7 to 4.1) Gravelly SILT; some sand; trace cobbles; trace boulders; fine to coarse grained, angular to subrounded, gap graded, non plastic, cohesive, dark greyish brown, very dense, dry to moist, massive. [Glacial Till]	
2.0	1064.0						
3.0	1063.0						
4.0	1062.0					End of Test Pit: 4.1 m Limit of excavator	
5.0	1061.0						
	1060.0						

GENERAL REMARKS:

Easy to excavate, no groundwater, walls stable.

SAMPLING SYMBOLS:

GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-296

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-297
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 16 Oct 14

Location: Tailings and Reclaim Pipeline Corridor
Total Depth: 1.4 m
Date Completed: 16 Oct 14

Coordinates: 685,658 E , 5,605,991 N UTM NAD83 ZONE10
Elevation: 1065.2 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1065.0					**TOPSOIL & ORGANICS** (0 to 0.2) ORGANICS, root inclusions; and TOPSOIL; SILT; some sand; trace gravel, fine grained; subrounded to angular, poorly graded, dark brown, non plastic, loose, dry, massive.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.4 m
1.0	1064.0					**SAND AND SILT** (0.2 to 1.4) SILT and SAND; some gravel; trace cobbles; fine to coarse grained, angular to subrounded, gap graded, light greyish brown, non plastic, loose to compact, dry, massive. [Colluvium]	
1.4						End of Test Pit: 1.4 m Refusal on bedrock	
2.0	1063.0						
3.0	1062.0						
4.0	1061.0						
5.0	1060.0						

GENERAL REMARKS:
Bedrock outcrops nearby, very easy to excavate, no groundwater, walls stable.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-297

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-298
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 16 Oct 14

Location: SMRSF
Total Depth: 3.3 m
Date Completed: 16 Oct 14

Coordinates: 686,150 E , 5,607,203 N UTM NAD83 ZONE10
Elevation: 989.1 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	989.0					**TOPSOIL & ORGANICS** (0 to 0.2) ORGANICS, root inclusions; and TOPSOIL; Sandy; SILT, trace gravel, fine grained; subrounded to angular, poorly graded, dark brown, non plastic, loose, dry, massive.	0 m - A: 0 - 0.2 m
						GRAVELLY SANDY SILT (0.2 to 3.3) Gravelly Sandy SILT; trace cobbles; trace boulders, fine to coarse grained, angular to subrounded, well graded, medium greyish brown, non plastic, compact to dense, dry to moist, massive. [Glacial Till]	
1.0	988.0						
2.0	987.0						
3.0	986.0					End of Test Pit: 3.3 m Refusal on dense material	
4.0	985.0						
5.0	984.0						

GENERAL REMARKS:
Easy to excavate up to 2 m, no groundwater, walls stable.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-298

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-299
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 16 Oct 14

Location: Tailings and Reclaim Pipeline Corridor
Total Depth: 0.2 m
Date Completed: 16 Oct 14

Coordinates: 686,081 E , 5,606,774 N UTM NAD83 ZONE10
Elevation: 1023.2 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1023.0					**TOPSOIL & ORGANICS** (0 to 0.05) ORGANICS, root inclusions; and TOPSOIL; Sandy; SILT, trace gravel, fine grained, poorly graded, dark brown, non plastic, loose, dry.	0 m - No Soil Horizons
						WEATHERED BEDROCK (0.05 to 0.2) Moderately weathered, light grey, strong iron oxide staining, strong, moderately fractured.	
						End of Test Pit: 0.2 m Refusal on bedrock	
1.0	1022.0						
2.0	1021.0						
3.0	1020.0						
4.0	1019.0						
5.0	1018.0						

GENERAL REMARKS:
Bedrock outcrops nearby; bedrock at surface; no groundwater.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-299

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-300
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 17 Oct 14

Location: Tailings and Reclaim Pipeline Corridor
Total Depth: 2 m
Date Completed: 17 Oct 14

Coordinates: 685,838 E , 5,606,715 N UTM NAD83 ZONE10
Elevation: 1061.4 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1061.0					**TOPSOIL & ORGANICS** (0 to 0.9) ORGANICS, root inclusions; and TOPSOIL; SILT; some sand; trace gravel, fine to coarse grained; subrounded to angular, poorly graded, dark brown, non plastic, loose, dry.	0 m - A: 0 - 0.9 m
1.0	1060.0					**SILTY SAND** (0.9 to 2) Silty SAND; some gravel; trace cobbles; fine to coarse grained, angular to subrounded, gap graded, light greyish brown, non plastic, compact, dry, massive. [Colluvium]	
2.0	1059.0					End of Test Pit: 2 m Refusal on highly weathered rock	
3.0	1058.0						
4.0	1057.0						
5.0	1056.0						

GENERAL REMARKS:
Easy to excavate up to 2 m, no groundwater, walls sloughing slightly.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-300

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-301
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 17 Oct 14

Location: Tailings and Reclaim Pipeline Corridor
Total Depth: 3.3 m
Date Completed: 17 Oct 14

Coordinates: 685,616 E , 5,606,665 N UTM NAD83 ZONE10
Elevation: 1076.8 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1076.0					**TOPSOIL & ORGANICS** (0 to 0.2) ORGANICS, root inclusions; and TOPSOIL; SILT; some sand; fine grained; subrounded to angular, poorly graded, dark brown to black, non plastic, loose, moist to saturated.	0 m - No Soil Horizons
						SILT (0.2 to 0.3) SILT; some sand; trace gravel; trace clay; fine grained, poorly graded, light grey to white, high plasticity, loose, moist.	
1.0						**SAND** (0.3 to 2) SAND; some silt; trace gravel; trace clay; fine to coarse grained, angular to subrounded, poorly graded, dark grey, low plasticity.	
	1075.0	G B	TP14-301-1				
2.0					▼	**SILT SOME SAND, CLAY AND GRAVEL** (2 to 3.3) SILT; some sand; some clay; some gravel; trace cobbles; fine to coarse grained, angular to subrounded, poorly graded, light orangey yellowish brown, medium plasticity, saturated, loose, massive. [Completely Weathered Bedrock]	2 m - Groundwater Seepage at 2.0 m
	1074.0						
3.0						End of Test Pit: 3.3 m Refusal on highly weathered rock	
	1073.0						
4.0							
	1072.0						
5.0							
	1071.0						

GENERAL REMARKS:

Groundwater at 2 m, material at 2 m onwards appears to be completely weathered rock, test pit located in small valley and may not be representative of deeper ground.

SAMPLING SYMBOLS:

G B GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-301

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-302
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 17 Oct 14

Location: SMRSF
Total Depth: 4.1 m
Date Completed: 17 Oct 14

Coordinates: 686,051 E , 5,607,452 N UTM NAD83 ZONE10
Elevation: 1021 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1021.0					**TOPSOIL & ORGANICS** (0 to 0.2) ORGANICS, root inclusions; and TOPSOIL; SILT; some sand; fine grained; rounded to subangular, poorly graded, light to medium brown, non plastic, loose, dry.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.2 m 0.2 m - C: 0.2 - 0.3 m
						GRAVELLY SANDY SILT (0.2 to 4.1) Gravelly Sandy SILT; some cobbles; trace boulders, fine to coarse grained, angular to rounded, gap graded, medium greyish brown, non plastic, very dense, moist to dry, massive. [Glacial Till]	
1.0	1020.0						
2.0	1019.0						
3.0	1018.0						
4.0	1017.0					End of Test Pit: 4.1 m Limit of excavator	
5.0	1016.0						

GENERAL REMARKS:
Difficult to excavate, no groundwater, walls stable.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-302

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-303
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 17 Oct 14

Location: SMRSF
Total Depth: 0.9 m
Date Completed: 17 Oct 14

Coordinates: 686,009 E , 5,607,686 N UTM NAD83 ZONE10
Elevation: 1019.8 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1019.0					**TOPSOIL & ORGANICS** (0 to 0.4) ORGANICS, root inclusions; and TOPSOIL; SILT; some sand; trace gravel, fine to coarse grained; rounded to angular, poorly graded, dark to medium brown, non plastic, loose to compact, dry.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.4 m 0.4 m - C: 0.4 - 0.7 m
1.0	1018.0					**SILTY SAND** (0.4 to 0.7) Silty SAND; some gravel; trace cobbles; fine to coarse grained, angular to subrounded, poorly graded, light grey, compact, dry.	
						GRAVELLY SAND (0.7 to 0.9) Gravelly SAND; some silt; trace cobbles, fine to coarse grained, angular to rounded, well graded, medium greyish brown, non plastic, compact, dry, massive. [Colluvium]	
2.0	1017.0					**BEDROCK** (0.9) End of Test Pit: 0.9 m Refusal on bedrock	
3.0	1016.0						
4.0	1015.0						
5.0	1014.0						

GENERAL REMARKS:
Bedrock outcrops nearby, easy to excavate, walls sloughing.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-303

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-304
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 17 Oct 14

Location: SMRSF
Total Depth: 3.5 m
Date Completed: 17 Oct 14

Coordinates: 685,752 E , 5,607,794 N UTM NAD83 ZONE10
Elevation: 1031.8 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1031.0					**TOPSOIL & ORGANICS** (0 to 0.3) ORGANICS, root inclusions; and TOPSOIL; SILT; some sand; trace gravel, fine to coarse grained; rounded to subangular, poorly graded, dark to medium brown, non plastic, loose, dry.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.3 m
						GRAVELLY SAND (0.3 to 3.5) gravelly SAND; some silt; trace cobbles; fine to coarse grained, subangular to rounded, well graded, non plastic, compact, dry, massive. [Glacial Till]	
1.0	1030.0						
2.0	1029.0						
3.0		G B	TP14-304-1				
	1028.0					End of Test Pit: 3.5 m Refusal on dense material	
4.0	1027.0						
5.0	1026.0						

GENERAL REMARKS:
Difficult to excavate after 3 m, no groundwater, walls stable.

SAMPLING SYMBOLS:
G B GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-304

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-305
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 17 Oct 14

Location: SMRSF
Total Depth: 1.1 m
Date Completed: 17 Oct 14

Coordinates: 686,305 E , 5,607,041 N UTM NAD83 ZONE10
Elevation: 976.4 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	976.0					**TOPSOIL & ORGANICS** (0 to 0.2) ORGANICS, root inclusions; and TOPSOIL; SILT; some sand; fine grained, poorly graded, black, non plastic, loose, saturated.	0 m - A: 0 - 0.2 m
						SILTY SAND (0.2 to 0.7) Silty SAND; trace gravel; trace cobbles, fine to coarse grained, angular to subrounded, poorly graded, dark grey, loose, saturated.	
1.0	975.0				▼	**WEATHERED BEDROCK** (0.7 to 1.1) Completely weathered bedrock, resembles CLAY/SILT, green/orange/grey, soft, saturated, medium plasticity. [Completely Weathered Bedrock]	1 m - Groundwater Seepage at 1.0 m
						End of Test Pit: 1.1 m Refusal on bedrock	
2.0	974.0						
3.0	973.0						
4.0	972.0						
5.0	971.0						

GENERAL REMARKS:
Very easy to excavate, bottom 20 cm of test pit filled with groundwater in less than 1 minute, walls sloughing.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-305

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Contractor: Cobra Contracting Ltd.
Location: SMRSF Water Management Pond
Coordinates: 686,459 E , 5,606,863 N UTM NAD83 ZONE10

Test Pit No.: TP14-306
Equipment Used: CAT 320D L
Total Depth: 2.6 m
Elevation: 977.5 m

Page: 1 of 1
Date Started: 17 Oct 14
Date Completed: 17 Oct 14
Logged by: MAP
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	977.5					**TOPSOIL & ORGANICS** (0 to 0.5) ORGANICS, root inclusions; and TOPSOIL; SILT; trace sand; trace gravel, fine grained, poorly graded, dark brown to black, non plastic, loose, moist.	0 m - A: 0 - 0.3 m 0.3 m - B: 0.3 - 0.5 m
1.0	976.5					**SANDY GRAVEL** (0.5 to 2.6) Sandy GRAVEL; some silt; trace cobbles; fine to coarse grained, rounded to subrounded, well graded, grey to brown, non plastic, loose, dry to saturated, massive. [Glaciofluvial]	
2.0	975.5	G B	TP14-306-1				
2.6	974.9					End of Test Pit: 2.6 m Wall instability / groundwater	2.6 m - Groundwater Seepage at 2.6 m
3.0	974.5						
4.0	973.5						
5.0	972.5						

GENERAL REMARKS:
Very easy to excavate, gravel material sloughing beneath topsoil layer.

SAMPLING SYMBOLS:
G B GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-306

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-307
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 18 Oct 14

Location: SMRSF Water Management Pond
Total Depth: 0.6 m
Date Completed: 18 Oct 14

Coordinates: 686,604 E , 5,606,835 N UTM NAD83 ZONE10
Elevation: 991.9 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	991.9					**TOPSOIL & ORGANICS** (0 to 0.05) ORGANICS, root inclusions; and TOPSOIL; SILT; trace sand; trace gravel, fine grained, subangular to rounded, poorly graded, medium to dark brown, non plastic, loose, dry, massive.	0 m - A: 0 - 0.05 m 0.05 m - B: 0.05 - 0.3 m
						SILT (0.05 to 0.3) SILT; trace sand; trace gravel, fine grained, subangular to rounded, poorly graded, medium to dark brown, non plastic, loose, dry, massive.	
1.0	991.0					**WEATHERED BEDROCK** (0.3 to 0.6) Rubblized bedrock, dark grey, very strong, iron oxide staining.	
						End of Test Pit: 0.6 m Refusal on bedrock	
2.0	990.0						
3.0	989.0						
4.0	988.0						
5.0	987.0						
	986.0						

GENERAL REMARKS:
Bedrock outcrops nearby, easy to excavate up to bedrock, no groundwater, walls stable.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-307

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-308
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 18 Oct 14

Location: SMRSF Water Management Pond
Total Depth: 3.2 m
Date Completed: 18 Oct 14

Coordinates: 686,699 E , 5,606,967 N UTM NAD83 ZONE10
Elevation: 982.6 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	982.0					**TOPSOIL & ORGANICS** (0 to 0.4) ORGANICS, root inclusions; and TOPSOIL; SILT; trace sand; trace gravel, fine grained, poorly graded, dark brown, non plastic, loose, dry.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.4 m
						SILT (0.4 to 0.8) SILT; trace sand; trace gravel, fine grained, poorly graded, dark brown, non plastic, loose, dry.	
1.0						**GRAVELLY SANDY SILT** (0.8 to 3.2) Gravelly Sandy SILT; trace cobbles, fine to coarse grained, angular to subrounded, gap graded, medium grey, low to no plasticity, very dense, moist, massive. [Glacial Till]	
	981.0	G B	GP14-016				
2.0							
	980.0						
3.0						End of Test Pit: 3.2 m Refusal on bedrock	
	979.0						
4.0							
	978.0						
5.0							
	977.0						

GENERAL REMARKS:
Difficult to excavate, no groundwater, walls stable.

SAMPLING SYMBOLS:
G B GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-308

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Contractor: Cobra Contracting Ltd.
Location: Tailings and Reclaim Pipeline Corridor
Coordinates: 686,812 E , 5,607,361 N UTM NAD83 ZONE10

Test Pit No.: TP14-309
Equipment Used: CAT 320D L
Total Depth: 3.1 m
Elevation: 985.5 m

Page: 1 of 1
Date Started: 18 Oct 14
Date Completed: 18 Oct 14
Logged by: MAP
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	985.5					**TOPSOIL & ORGANICS** (0 to 0.3) ORGANICS, root inclusions; and TOPSOIL; SILT; trace sand; trace gravel, fine grained, poorly graded, dark brown, non plastic, loose, dry.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.3 m
						GRAVELLY SANDY SILT (0.3 to 3.1) Gravelly Sandy SILT; trace cobbles, fine to coarse grained, angular to subrounded, gap graded, dark greyish brown, non plastic, very dense, moist, massive. [Glacial Till]	
1.0	984.0						
2.0	983.0						
3.0	982.0					End of Test Pit: 3.1 m Refusal on dense material	
4.0	981.0						
5.0	980.0						

GENERAL REMARKS:
Difficult to excavate; no groundwater; walls stable.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-309

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Project: AJAX PROJECT
Contractor: Cobra Contracting Ltd.
Location: SMRSF
Coordinates: 686,478 E , 5,607,227 N UTM NAD83 ZONE10

Test Pit No.: TP14-310
Equipment Used: CAT 320D L
Total Depth: 4.3 m
Elevation: 1006.5 m

Page: 1 of 1
Date Started: 18 Oct 14
Date Completed: 18 Oct 14
Logged by: MAP
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1006.0					**TOPSOIL & ORGANICS** (0 to 0.4) ORGANICS, root inclusions; and TOPSOIL; SILT; some sand; trace gravel, fine to coarse grained; rounded to subangular, poorly graded, dark to medium brown, non plastic, loose to compact, dry.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.4 m 0.4 m - C: 0.4 - 0.7 m
						SILTY SAND (0.4 to 0.7) Silty SAND; some gravel; trace cobbles; fine to coarse grained, well graded, non plastic, light grey, dense, dry.	
1.0	1005.0					**GRAVELLY SILT** (0.7 to 4.3) Gravelly SILT; some sand; trace cobbles, fine to coarse grained, subangular to rounded, well graded, dark greyish brown, very dense, low plasticity, moist, massive. [Glacial Till]	
2.0	1004.0						
3.0	1003.0						
4.0		G B	TP14-310-1				
	1002.0					End of Test Pit: 4.3 m Limit of excavator	
5.0	1001.0						

GENERAL REMARKS:
Difficult to excavate, no groundwater, walls stable.

SAMPLING SYMBOLS:
G B GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-310

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Contractor: Cobra Contracting Ltd.
Location: SMRSF
Coordinates: 686,312 E , 5,607,361 N UTM NAD83 ZONE10

Test Pit No.: TP14-311
Equipment Used: CAT 320D L
Total Depth: 4.2 m
Elevation: 1017.8 m

Page: 1 of 1
Date Started: 18 Oct 14
Date Completed: 18 Oct 14
Logged by: MAP
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1017.8					**TOPSOIL & ORGANICS** (0 to 0.2) ORGANICS, root inclusions; and TOPSOIL; SILT; trace sand; trace gravel, fine to coarse grained; rounded to angular, poorly graded, medium brown, non plastic, loose, dry.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.2 m 0.2 m - C: 0.2 - 0.5 m
						GRAVELLY SAND (0.2 to 0.8) Gravelly SAND; some silt; fine to coarse grained, angular to subrounded, well graded, light grey, non plastic, compact to dense, dry, massive.	
1.0	1017.0					**GRAVELLY SILT** (0.8 to 4.2) gravelly SILT; some sand; trace cobbles; trace boulders, fine to coarse grained, well graded, dark brownish grey, low to no plasticity, very dense, moist, massive. [Glacial Till]	
2.0	1016.0						
3.0	1015.0						
4.0	1014.0					End of Test Pit: 4.2 m Limit of excavator	
5.0	1013.0						
	1012.0						

GENERAL REMARKS:
Difficult to excavate, no groundwater, walls stable.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-311

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-312
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 18 Oct 14

Location: SMRSF
Total Depth: 4.5 m
Date Completed: 18 Oct 14

Coordinates: 686,571 E , 5,607,422 N UTM NAD83 ZONE10
Elevation: 1018.4 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1018.0					**TOPSOIL & ORGANICS** (0 to 0.2) ORGANICS, root inclusions; and TOPSOIL; SILT; trace sand; trace gravel, fine to coarse grained; rounded, poorly graded, dark to medium brown, non plastic, loose, dry, massive.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.2 m
						SANDY GRAVEL (0.2 to 1.5) Sandy GRAVEL; some silt; trace cobbles; fine to coarse grained, rounded to subangular, well graded, grey to brown, non plastic, loose, dry to saturated, massive.	
1.0	1017.0						
						GRAVELLY SILT (1.5 to 4.5) gravelly SILT; some sand; trace cobbles; fine to coarse grained, angular to rounded, gap graded, dark brownish grey, low plasticity, very dense, moist, massive. [Glacial Till]	
2.0	1016.0						
3.0	1015.0						
4.0	1014.0					End of Test Pit: 4.5 m Limit of excavator	
5.0	1013.0						

GENERAL REMARKS:
Very easy to excavate, no groundwater, walls sloughing from 0.2 - 1.5 m in gravel material.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-312

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-313
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 18 Oct 14

Location: SMRSF
Total Depth: 4.2 m
Date Completed: 18 Oct 14

Coordinates: 686,436 E , 5,607,616 N UTM NAD83 ZONE10
Elevation: 1025.5 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1025.0					**TOPSOIL & ORGANICS** (0 to 0.4) ORGANICS, root inclusions; and TOPSOIL; SILT; trace sand; trace gravel, fine grained; subangular to rounded, poorly graded, dark brown, non plastic, loose, dry to moist, massive.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.4 m 0.4 m - C: 0.4 - 0.7 m
						SAND AND GRAVEL (0.4 to 0.7) SAND and GRAVEL; some silt; trace cobbles, fine to coarse grained, angular to subrounded, well graded, non plastic, light grey, compact, dry, massive.	
1.0	1024.0					**GRAVELLY SANDY SILT** (0.7 to 4.2) Gravelly Sandy SILT; trace cobbles; fine to coarse grained, angular to rounded, gap graded, dark greyish brown, low plasticity, very dense, moist, massive. [Glacial Till]	
2.0	1023.0						
3.0	1022.0						
4.0	1021.0					End of Test Pit: 4.2 m Limit of excavator	
5.0	1020.0						

GENERAL REMARKS:
Difficult to excavate, no groundwater, walls stable.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-313

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Contractor: Cobra Contracting Ltd.
Location: SMRSF
Coordinates: 686,248 E , 5,607,752 N UTM NAD83 ZONE10

Test Pit No.: TP14-314
Equipment Used: CAT 320D L
Total Depth: 3.3 m
Elevation: 1001.5 m

Page: 1 of 1
Date Started: 20 Oct 14
Date Completed: 20 Oct 14
Logged by: MAP
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1001.0					**TOPSOIL & ORGANICS** (0 to 0.3) ORGANICS, root inclusions; and TOPSOIL; SILT; some sand; trace gravel, fine to coarse grained; subangular to rounded, poorly graded, medium brown, non plastic, loose, dry, massive.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.3 m
1.0						**SILT** (0.3 to 1.5) SILT; some sand; trace gravel; fine to coarse grained, subangular to rounded, poorly graded, medium brown, non plastic, compact, dry, massive. [Loess]	
	1000.0					**GRAVELLY SANDY SILT** (1.5 to 3.3) Gravelly Sandy SILT; trace cobbles; fine to coarse grained, subangular to rounded, poorly graded, medium brown, non plastic, compact, dry, massive. [Glacial Till]	
2.0							
	999.0						
3.0						End of Test Pit: 3.3 m Refusal on dense material	
	998.0						
4.0							
	997.0						
5.0							
	996.0						

GENERAL REMARKS:
Difficult to excavate 1 m onward, no groundwater, walls stable.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-314

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Contractor: Cobra Contracting Ltd.
Location: SMRSF
Coordinates: 686,081 E , 5,607,913 N UTM NAD83 ZONE10

Test Pit No.: TP14-315
Equipment Used: CAT 320D L
Total Depth: 1.3 m
Elevation: 990.1 m

Page: 1 of 1
Date Started: 20 Oct 14
Date Completed: 20 Oct 14
Logged by: MAP
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0.0	990.0					**TOPSOIL & ORGANICS** (0 to 0.2) ORGANICS, root inclusions; and TOPSOIL; Sandy; SILT; trace gravel, fine to coarse grained; subangular to rounded, poorly graded, dark brown, non plastic, loose, dry, massive.	0 m - A: 0 - 0.2 m
1.0	989.0					**SILTY SAND** (0.2 to 1.3) Silty SAND; trace gravel; trace cobbles; fine to coarse grained, subangular to subrounded, poorly graded, medium brown, compact, dry, massive. [Colluvium]	
1.3	988.7					**WEATHERED BEDROCK** (1.3 to 1.3) Bedrock, medium grey, strong, slightly weathered with iron oxide staining. End of Test Pit: 1.3 m Refusal on bedrock	
2.0	988.0						
3.0	987.0						
4.0	986.0						
5.0	985.0						

GENERAL REMARKS:
Bedrock outcrops nearby, easy to excavate, no groundwater, walls stable.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-315

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Contractor: Cobra Contracting Ltd.
Location: SMRSF
Coordinates: 685,369 E , 5,608,152 N UTM NAD83 ZONE10

Test Pit No.: TP14-316
Equipment Used: CAT 320D L
Total Depth: 1.1 m
Elevation: 992.6 m

Page: 1 of 1
Date Started: 20 Oct 14
Date Completed: 20 Oct 14
Logged by: MAP
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	992.6					**TOPSOIL & ORGANICS** (0 to 0.4) ORGANICS, root inclusions; and TOPSOIL; SILT; trace sand; fine grained; angular to subrounded, poorly graded, dark greyish brown, non plastic, loose, dry, massive.	0 m - A: 0 - 0.3 m 0.3 m - B: 0.3 - 0.4 m
1.0	992.0					**SANDY SILT** (0.4 to 1.1) Sandy SILT; trace gravel; trace cobbles, fine grained, angular to subrounded, poorly graded, light grey, non plastic, loose, dry, massive. [Loess?]	
1.1	991.5					**WEATHERED BEDROCK** (1.1 to 1.1) Bedrock, dark grey, fresh, strong. End of Test Pit: 1.1 m Refusal on bedrock	
2.0	991.0						
3.0	990.0						
4.0	989.0						
5.0	988.0						
	987.0						

GENERAL REMARKS:
Bedrock outcrops nearby, no groundwater, walls stable.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-316

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-317
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 20 Oct 14

Location: SMRSF
Total Depth: 2.1 m
Date Completed: 20 Oct 14

Coordinates: 685,184 E , 5,608,336 N UTM NAD83 ZONE10
Elevation: 998 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
						TOPSOIL & ORGANICS (0 to 0.2) ORGANICS, root inclusions; and TOPSOIL; SILT; some sand; trace gravel, fine grained; poorly graded, medium brown, non plastic, loose, dry, massive.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.2 m
						SILT (0.2 to 1) SILT; some sand; trace gravel; trace cobbles; fine grained, poorly graded, medium brown, non plastic, loose, dry, massive. [Loess]	
1.0	997.0					**SANDY SILT** (1 to 2.1) Sandy SILT; trace cobbles; trace gravel; fine to coarse grained, angular to subrounded, poorly graded, medium greyish brown, non plastic, dense, dry, massive. [Glacial Till]	
2.0	996.0					**WEATHERED BEDROCK** (2.1 to 2.1) Bedrock, medium grey, strong, fresh. End of Test Pit: 2.1 m Refusal on bedrock	
3.0	995.0						
4.0	994.0						
5.0	993.0						

GENERAL REMARKS:
Bedrock outcrops nearby, easy to excavate, no groundwater, walls stable.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-317

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-318
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 20 Oct 14

Location: SMRSF
Total Depth: 2.1 m
Date Completed: 20 Oct 14

Coordinates: 685,228 E , 5,607,913 N UTM NAD83 ZONE10
Elevation: 1006 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1006.0					**TOPSOIL & ORGANICS** (0 to 0.4) ORGANICS, root inclusions; and TOPSOIL; SILT; some sand; trace gravel, fine to coarse grained; angular to subrounded, poorly graded, medium brown, non plastic, loose to compact, dry, massive.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.4 m
						GRAVELLY SANDY SILT (0.4 to 2.1) Gravelly Sandy SILT; trace cobbles; fine to coarse grained, subangular to subrounded, poorly graded, medium greyish brown, non plastic, very dense, dry. [Glacial Till]	
1.0	1005.0						
2.0	1004.0					End of Test Pit: 2.1 m Limit of excavator on steep hillside	
3.0	1003.0						
4.0	1002.0						
5.0	1001.0						

GENERAL REMARKS:
Steep hillside, east to excavate up to 1.5 m, no groundwater, walls stable.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-318

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, TEST PIT LOG, 2014 KP DATA TEMPLATE REVB.GDT, 17-Mar-15

Project: AJAX PROJECT
Test Pit No.: TP14-319
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 20 Oct 14

Location: Conveyor Corridor
Total Depth: 3.7 m
Date Completed: 20 Oct 14

Coordinates: 686,030 E , 5,608,440 N UTM NAD83 ZONE10
Elevation: 946.5 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	946.0					**TOPSOIL & ORGANICS** (0 to 0.4) ORGANICS, root inclusions; and TOPSOIL; SILT; trace sand, fine grained; subangular to rounded, poorly graded, dark brown, loose, dry, massive.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.4 m 0.4 m - C: 0.4 - 0.7 m
						GRAVELLY SAND (0.4 to 0.7) Gravelly SAND; some silt; trace cobbles; fine to coarse grained, angular to subrounded, well graded, light grey, non plastic, dense, dry, massive.	
1.0	945.0					**SANDY, GRAVELLY, SILT** (0.7 to 3.7) Sandy gravelly SILT; some to trace cobbles; fine to coarse grained, angular to subrounded, well graded, dark greyish brown, low to no plasticity, moist, very dense, moist, massive. [Glacial Till]	
2.0	944.0						
3.0	943.0						
3.7	942.8					End of Test Pit: 3.7 m Refusal on dense material	
4.0	942.0						
5.0	941.0						

GENERAL REMARKS:
Difficult to excavate, no groundwater, walls stable.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-319

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-320
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 20 Oct 14

Location: Conveyor Corridor
Total Depth: 1.6 m
Date Completed: 20 Oct 14

Coordinates: 685,845 E , 5,608,576 N UTM NAD83 ZONE10
Elevation: 940.9 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	940.9					**TOPSOIL & ORGANICS** (0 to 0.4) ORGANICS, root inclusions; and TOPSOIL; SILT; some sand; trace gravel, fine to coarse grained; subangular to rounded, poorly graded, medium to dark brown, non plastic, loose to compact, dry, massive.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.4 m
1.0	940.0					**SANDY SILT** (0.4 to 1.6) Sandy SILT; some gravel; trace cobbles; fine to coarse grained, angular to subrounded, well graded, medium greyish brown, non plastic, very dense, dry, massive. [Colluvium]	
2.0	939.0					**WEATHERED BEDROCK** (1.6 to 1.6) Medium to dark grey, strong, fresh to slightly weathered, calcite on surfaces. End of Test Pit: 1.6 m Refusal on bedrock	
3.0	938.0						
4.0	937.0						
5.0	936.0						
	935.0						

GENERAL REMARKS:
Bedrock outcrops nearby, easy to excavate, no groundwater, walls stable.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-320

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-321
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 21 Oct 14

Location: Conveyor Corridor
Total Depth: 4.4 m
Date Completed: 21 Oct 14

Coordinates: 685,672 E , 5,608,697 N UTM NAD83 ZONE10
Elevation: 931.8 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	931.8					**TOPSOIL & ORGANICS** (0 to 0.4) ORGANICS, root inclusions; and TOPSOIL; SILT; some sand; trace gravel, fine to coarse grained; subangular to subrounded, poorly graded, dark brown, non plastic, loose, dry.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.4 m
						GRAVELLY SANDY SILT (0.4 to 4.4) Gravelly Sandy SILT; trace boulders; trace cobbles, fine to coarse grained, gap graded, angular to subrounded, medium greyish brown, medium plasticity, dense, moist, massive. [Glacial Till]	
1.0	931.0						
2.0	930.0						
3.0	929.0						
4.0	928.0						
4.4	927.4					End of Test Pit: 4.4 m Limit of excavator	
5.0	927.0						
	926.0						

GENERAL REMARKS:
Relatively easy to excavate, no groundwater, walls stable.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-321

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-322
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 21 Oct 14

Location: Conveyor Corridor
Total Depth: 3.6 m
Date Completed: 21 Oct 14

Coordinates: 685,557 E , 5,608,792 N UTM NAD83 ZONE10
Elevation: 928.7 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	928.7					**TOPSOIL & ORGANICS** (0 to 0.3) ORGANICS, root inclusions; and TOPSOIL; SILT; some sand; trace gravel, fine to coarse grained; subangular to rounded, poorly graded, medium to dark brown, non plastic, loose, dry.	0 m - A: 0 - 0.3 m
0.3	928.4					**SILTY SAND** (0.3 to 0.6) Silty SAND; trace cobbles; trace gravel; fine to coarse grained, subangular to subrounded, poorly graded, medium greyish brown, non plastic, dense, dry, massive.	
0.6	928.1					**GRAVELLY SANDY SILT** (0.6 to 3.6) Gravelly Sandy SILT; trace boulders; trace cobbles, fine to coarse grained, gap graded, angular to subrounded, medium greyish brown, medium plasticity, dense, moist, massive. [Glacial Till]	
1.0	928.0						
2.0	927.0						
3.0	926.0						
3.6	925.1					End of Test Pit: 3.6 m Refusal on cobbles / boulders	
4.0	925.0						
5.0	924.0						
	923.0						

GENERAL REMARKS:
Easy to excavate up to 3 m, no groundwater, walls stable.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-322

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Contractor: Cobra Contracting Ltd.
Location: Plant Site
Coordinates: 686,319 E , 5,608,348 N UTM NAD83 ZONE10

Test Pit No.: TP14-323
Equipment Used: CAT 320D L
Total Depth: 4.4 m
Elevation: 971.4 m

Page: 1 of 1
Date Started: 21 Oct 14
Date Completed: 21 Oct 14
Logged by: MAP
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	971.0					**TOPSOIL & ORGANICS** (0 to 0.3) ORGANICS, root inclusions; and TOPSOIL; SILT; some sand; trace gravel, fine to coarse grained; subangular to rounded, poorly graded, non plastic, loose, dry.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.3 m
						SILTY SAND (0.3 to 1) Silty SAND; some gravel; trace cobbles; fine to coarse grained, angular to subrounded, well graded, light greyish brown, non plastic, compact to dense, dry, massive.	
1.0	970.0					**GRAVELLY SILT** (1 to 4.4) gravelly SILT; some sand; trace cobbles, fine to coarse grained, angular to rounded, poorly graded, dark greyish brown, medium plasticity, very dense, moist, massive. [Glacial Till]	
2.0	969.0						
3.0	968.0						
4.0	967.0	G B	TP14-323-1			End of Test Pit: 4.4 m Limit of excavator	
5.0	966.0						

GENERAL REMARKS:
Difficult to excavate, no groundwater, walls stable.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-323

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Contractor: Cobra Contracting Ltd.
Location: Plant Site
Coordinates: 686,645 E , 5,608,170 N UTM NAD83 ZONE10

Test Pit No.: TP14-324
Equipment Used: CAT 320D L
Total Depth: 2.9 m
Elevation: 967.4 m

Page: 1 of 1
Date Started: 21 Oct 14
Date Completed: 21 Oct 14
Logged by: MAP
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	967.0					**TOPSOIL & ORGANICS** (0 to 0.3) ORGANICS, root inclusions; and TOPSOIL; SILT; some sand; trace gravel, fine to coarse grained; subangular to rounded, poorly graded, medium to dark brown, non plastic, loose to compact, dry.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.3 m
1.0	966.0					**SILTY GRAVELLY SAND** (0.3 to 1) Silty gravelly SAND; trace cobbles, fine to coarse grained, angular to subrounded, well graded, light to medium greyish brown, non plastic, dense, dry, massive.	
2.0	965.0					**GRAVELLY SILT** (1 to 2.9) gravelly SILT; some sand; trace cobbles, fine to coarse grained, angular to rounded, poorly graded, dark greyish brown, low plasticity, very dense, moist, massive. [Glacial Till]	
3.0	964.0					End of Test Pit: 2.9 m Refusal on bedrock	
4.0	963.0						
5.0	962.0						

GENERAL REMARKS:
Easy to excavate, no groundwater, walls stable.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-324

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-325
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 21 Oct 14

Location: Plant Site
Total Depth: 4 m
Date Completed: 21 Oct 14

Coordinates: 686,859 E , 5,608,012 N UTM NAD83 ZONE10
Elevation: 962.4 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	962.0					**TOPSOIL & ORGANICS** (0 to 0.3) ORGANICS, root inclusions; and TOPSOIL; SILT; some sand; trace gravel, fine to coarse grained; subangular to rounded, poorly graded, medium to dark brown, loose, dry.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.3 m 0.3 m - C: 0.3 - 0.7 m
						SILTY SAND (0.3 to 0.7) Silty SAND; some gravel; trace cobbles; fine to coarse grained, angular to subrounded, well graded, light grey, non plastic, dense, dry, massive.	
1.0	961.0					**GRAVELLY SILT** (0.7 to 4) gravelly SILT; some sand; trace cobbles, fine to coarse grained, subangular to subrounded, poorly graded, dark greyish brown, low plasticity, very dense, moist, massive. [Glacial Till]	
2.0	960.0						
3.0	959.0						
4.0	958.0					End of Test Pit: 4 m Refusal on dense material	
5.0	957.0						

GENERAL REMARKS:
Difficult to excavate, no groundwater, walls stable.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-325

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-326
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 21 Oct 14

Location: Plant Site
Total Depth: 3.9 m
Date Completed: 21 Oct 14

Coordinates: 686,869 E , 5,608,170 N UTM NAD83 ZONE10
Elevation: 963 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
						TOPSOIL & ORGANICS (0 to 0.3) ORGANICS, root inclusions; and TOPSOIL; SILT; some sand; trace gravel, fine to coarse grained; subangular to rounded, poorly graded, non plastic, medium to dark brown, loose, dry, massive.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.3 m 0.3 m - C: 0.3 - 0.9 m
						SILTY SAND (0.3 to 0.9) Silty SAND; some gravel; trace cobbles, fine to coarse grained, angular to subrounded, gap graded, light grey, non plastic, dense, dry, massive.	
1.0	962.0					**GRAVELLY SILT** (0.9 to 3.9) gravelly SILT; some to trace sand; trace cobbles, fine to coarse grained, subangular to rounded, poorly graded, dark greyish brown, low plasticity, very dense, moist, massive. [Glacial Till]	
2.0	961.0						
3.0	960.0						
4.0	959.0					End of Test Pit: 3.9 m Refusal on dense material	
5.0	958.0						

GENERAL REMARKS:
Difficult to excavate, no groundwater, walls stable.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-326

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-327
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 21 Oct 14

Location: Plant Site
Total Depth: 4.5 m
Date Completed: 21 Oct 14

Coordinates: 686,708 E , 5,608,348 N UTM NAD83 ZONE10
Elevation: 948.4 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	948.0					**TOPSOIL & ORGANICS** (0 to 0.4) ORGANICS, root inclusions; and TOPSOIL; SILT; some sand; trace gravel, fine to coarse grained; subangular to rounded, poorly graded, non plastic, medium to dark brown, loose, dry.	0 m - A: 0 - 0.3 m 0.3 m - B: 0.3 - 0.4 m
1.0	947.0					**SILTY GRAVELLY SAND** (0.4 to 4.5) silty gravelly SAND; some cobbles; trace boulders, fine to coarse grained, angular to rounded, well graded, non plastic, dark greyish brown, moist, dense, massive. [Glacial Till]	
2.0	946.0						
3.0	945.0						
4.0	944.0					End of Test Pit: 4.5 m Limit of excavator	
5.0	943.0						

GENERAL REMARKS:
Easy to excavate, no groundwater, walls stable.

SAMPLING SYMBOLS:
G B GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-327

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-328
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 22 Oct 14

Location: Plant Site
Total Depth: 4.3 m
Date Completed: 22 Oct 14

Coordinates: 686,510 E , 5,607,990 N UTM NAD83 ZONE10
Elevation: 993.3 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	993.0					**TOPSOIL & ORGANICS** (0 to 0.2) ORGANICS, root inclusions; and TOPSOIL; SILT; trace gravel; trace sand, fine grained, medium brown, loose, dry.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.2 m 0.2 m - C: 0.2 - 0.5 m
						GRAVELLY SAND (0.2 to 0.5) Gravelly SAND; some silt; trace cobbles; fine to coarse grained, angular to subrounded, well graded, light grey, non plastic, dense, dry.	
1.0	992.0					**GRAVELLY SANDY SILT** (0.5 to 4.3) Gravelly Sandy SILT; trace cobbles, fine to coarse grained, subangular to subrounded, poorly graded, dark greyish brown, low plasticity, very dense, moist, massive. [Glacial Till]	
2.0	991.0						
3.0	990.0						
4.0	989.0					End of Test Pit: 4.3 m Limit of excavator	
5.0	988.0						

GENERAL REMARKS:
Difficult to excavate, no groundwater, walls stable.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-328

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-329
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 22 Oct 14

Location: Haul road
Total Depth: 3.9 m
Date Completed: 22 Oct 14

Coordinates: 686,740 E , 5,607,652 N UTM NAD83 ZONE10
Elevation: 983.8 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	983.8					**TOPSOIL & ORGANICS** (0 to 0.2) ORGANICS, root inclusions; and TOPSOIL; SILT; some sand; trace gravel, fine to coarse grained, subangular to rounded, poorly graded, dark to medium brown, loose to compact, dry.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.2 m 0.2 m - C: 0.2 - 0.5 m
						SAND (0.2 to 0.6) SAND; some gravel; some silt; trace cobbles, fine to coarse grained, angular to subrounded, well graded, light grey, non plastic, dense, dry.	
1.0	983.0					**GRAVELLY SANDY SILT** (0.6 to 3.9) Gravelly Sandy SILT: trace cobbles; fine to coarse grained, angular to subrounded, poorly graded, low to medium plasticity, very dense, moist, massive. [Glacial Till]	
2.0	982.0						
3.0	981.0						
4.0	980.0					End of Test Pit: 3.9 m Refusal on dense material	
5.0	979.0						
	978.0						

GENERAL REMARKS:
Difficult to excavate, no groundwater, walls stable.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-329

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-330
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 22 Oct 14

Location: SMRSF Water Management Pond
Total Depth: 3 m
Date Completed: 22 Oct 14

Coordinates: 686,459 E , 5,606,823 N UTM NAD83 ZONE10
Elevation: 979.8 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	979.0					**SAND** (0 to 1) SAND; some silt; trace gravel, fine to coarse grained, subangular to rounded, poorly graded, light brown, loose to compact, dry, massive.	0 m - TP on Existing Road
1.0						**GRAVELLY SANDY SILT** (1 to 3) Gravelly Sandy SILT; trace boulders; trace cobbles, fine to coarse grained, angular to subrounded, poorly graded, dark grey/brown, medium plasticity, very dense, massive. [Glacial Till]	
2.0	978.0						
3.0	977.0					End of Test Pit: 3 m Refusal on dense material	
4.0	976.0						
5.0	975.0						
	974.0						

GENERAL REMARKS:
Difficult to excavate, no groundwater, walls stable.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-330

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-331
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 22 Oct 14

Location: Potential Borrow Area
Total Depth: 3.9 m
Date Completed: 22 Oct 14

Coordinates: 686,764 E , 5,608,708 N UTM NAD83 ZONE10
Elevation: 885.8 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	885.0					**TOPSOIL & ORGANICS** (0 to 0.5) ORGANICS, root inclusions; and TOPSOIL; SILT; some sand; trace gravel, fine grained, poorly graded, dark brownish black, loose, moist.	0 m - A: 0 - 0.5 m
1.0						**SAND** (0.5 to 0.8) SAND; some silt; trace gravel, fine to medium grained, subangular to rounded, poorly graded, medium grey, loose, moist, massive.	
						SAND (0.8 to 2) SAND; some silt; trace gravel, fine to medium grained, subangular to rounded, poorly graded, orangey brown, loose, moist, massive. [Glaciofluvial]	
2.0	884.0						
3.0	883.0					**SILT** (2 to 3.9) SILT; some sand; trace cobbles; trace gravel; trace cobbles; trace boulders; fine to coarse grained, subangular to subrounded, poorly graded, medium plasticity, dark grey, dense, moist, massive. [Glacial Till]	
4.0	882.0	GB	TP14-331-1			End of Test Pit: 3.9 m Refusal on dense material	
5.0	881.0						
	880.0						

GENERAL REMARKS:
Easy to excavate up to 2 m, no groundwater, walls stable.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-331

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-332
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 22 Oct 14

Location: Potential Borrow Area
Total Depth: 3.3 m
Date Completed: 22 Oct 14

Coordinates: 685,957 E , 5,609,137 N UTM NAD83 ZONE10
Elevation: 882.1 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	882.0					**TOPSOIL & ORGANICS** (0 to 0.3) ORGANICS, root inclusions; and TOPSOIL; SILT; some sand; trace gravel, fine to coarse grained, poorly graded, medium brown, loose, dry.	0 m - A: 0 - 0.3 m 0.3 m - C: 0.3 - 0.7 m
						GRAVELLY SAND (0.3 to 0.7) Gravelly SAND; some silt; some to trace cobbles; fine to coarse grained, angular to rounded, well graded, light grey, non plastic, dense, dry, massive.	
1.0	881.0					**GRAVELLY SANDY SILT** (0.7 to 3.3) Gravelly Sandy SILT; trace cobbles; fine to coarse grained, subangular to rounded, poorly graded, dark greyish brown, low to medium plasticity, very dense, moist, massive. [Glacial Till]	
2.0	880.0						
3.0	879.0					End of Test Pit: 3.3 m Refusal on dense material	
4.0	878.0						
5.0	877.0						

GENERAL REMARKS:
Easy to excavate, no groundwater, walls sloughing slightly.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-332

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-333
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 23 Oct 14

Location: Potential Borrow Area
Total Depth: 5 m
Date Completed: 23 Oct 14

Coordinates: 685,702 E , 5,609,502 N UTM NAD83 ZONE10
Elevation: 899.5 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	899.0					**TOPSOIL & ORGANICS** (0 to 0.2) ORGANICS, root inclusions; and TOPSOIL; SILT; some sand; trace gravel, fine grained, subangular to rounded, poorly graded, medium brown, non plastic, loose, dry.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.4 m
						SANDY SILT (0.2 to 0.9) Sandy SILT; trace gravel, fine to coarse grained, subangular to rounded, poorly graded, medium brown, non plastic, compact, dry.	
1.0	898.0					**GRAVELLY SILT** (0.9 to 2) Gravelly SILT; some sand; some cobbles, fine to coarse grained, angular to subrounded, well graded, medium greyish brown, dense, non plastic, moist, massive. [Glacial Till]	
2.0	897.0					**SILT** (2 to 5) SILT; some clay; trace cobbles; fine grained, poorly graded, medium grey, dense, moist, stratified. [Glaciolacustrine]	
3.0	896.0						
4.0	895.0						
5.0	894.0					End of Test Pit: 5 m Limit of excavator	

GENERAL REMARKS:
Easy to excavate, no groundwater, walls stable.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-333

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-334
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 23 Oct 14

Location: Potential Borrow Area
Total Depth: 4.4 m
Date Completed: 23 Oct 14

Coordinates: 685,902 E , 5,609,354 N UTM NAD83 ZONE10
Elevation: 889.5 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	889.0					**TOPSOIL & ORGANICS** (0 to 0.1) ORGANICS, root inclusions; and TOPSOIL; SILT; some sand; trace gravel, fine grained, subangular to rounded, poorly graded, medium brown, non plastic, loose, dry.	0 m - A: 0 - 0.1 m
						SILT (0.1 to 1.3) SILT; trace sand; trace gravel; trace cobbles; fine to coarse grained, subangular to subrounded, poorly graded, medium brown, non plastic, loose to compact, dry, massive. [Loess]	
1.0							
	888.0					**SANDY GRAVEL** (1.3 to 2.5) Sandy GRAVEL; some cobbles; some silt; fine to coarse grained, subangular to rounded, well graded, medium brown, non plastic, compact, dry, massive. [Glaciofluvial]	
2.0							
	887.0					**SANDY SILT** (2.5 to 4.4) Sandy SILT; some gravel; some cobbles, fine to coarse grained, subangular to subrounded, poorly graded, dark greyish brown, low to medium plasticity, dense, moist, massive. [Glacial Till]	
3.0							
	886.0						
4.0							
	885.0					End of Test Pit: 4.4 m Limit of excavator	
5.0							
	884.0						

GENERAL REMARKS:
Easy to excavate, walls sloughing in gravel material from 1.3 - 2.5 m, no groundwater.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-334

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-335
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 23 Oct 14

Location: Potential Borrow Area
Total Depth: 4 m
Date Completed: 23 Oct 14

Coordinates: 686,176 E , 5,609,177 N UTM NAD83 ZONE10
Elevation: 886.8 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	886.8					**TOPSOIL & ORGANICS** (0 to 0.05) ORGANICS, root inclusions; and TOPSOIL; SILT; some sand; trace gravel, fine grained, subangular to rounded, poorly graded, medium brown, non plastic, loose, dry.	0 m - No Soil Horizons
						SANDY GRAVEL (0.05 to 2.5) Sandy GRAVEL; some cobbles; some silt; fine to coarse grained, subangular to rounded, well graded, brown/grey, non plastic, loose to compact, dry, massive. [Glaciofluvial]	
1.0	886.0						
2.0	885.0						
						SANDY SILT (2.5 to 4) Sandy SILT; trace cobbles; trace gravel; fine to coarse grained, angular to subrounded, poorly graded, dark greyish brown, low plasticity, dense, moist, massive. [Glaciofluvial]	
3.0	884.0						
4.0	883.0					End of Test Pit: 4 m Wall instability	
5.0	882.0						
	881.0						

GENERAL REMARKS:
Easy to excavate, walls sloughing from 0 - 2.5 m, no groundwater.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-335

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-336
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 23 Oct 14

Location: Potential Borrow Area
Total Depth: 3.7 m
Date Completed: 23 Oct 14

Coordinates: 686,415 E , 5,609,180 N UTM NAD83 ZONE10
Elevation: 893.6 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	893.6					**TOPSOIL & ORGANICS** (0 to 0.2) ORGANICS, root inclusions; and TOPSOIL; SILT; some sand; trace gravel, fine grained, subangular to rounded, poorly graded, medium brown, non plastic, loose, dry.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.2 m 0.2 m - C: 0.2 - 0.4 m
	893.0					**GRAVELLY SILT** (0.2 to 0.4) gravelly SILT; some sand; fine grained, subangular to rounded, poorly graded, light, non plastic, loose, dry.	
1.0						**GRAVELLY SAND** (0.4 to 0.6) gravelly SAND; some gravel; some silt; trace cobbles, fine to coarse grained, angular to subrounded, well graded, light grey, non plastic, dense, dry.	
	892.0					**GRAVELLY SANDY SILT** (0.6 to 3.7) Gravelly Sandy SILT; trace cobbles, fine to coarse grained, subangular to rounded, poorly graded, dark greyish brown, very dense, low to medium plasticity, moist, massive. [Glacial Till]	
2.0							
	891.0						
3.0							
	890.0					End of Test Pit: 3.7 m Refusal on dense material	
4.0							
	889.0						
5.0							
	888.0						

GENERAL REMARKS:
Difficult to excavate, no groundwater, walls stable.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-336

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-337
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 23 Oct 14

Location: Haul Road
Total Depth: 2.9 m
Date Completed: 23 Oct 14

Coordinates: 685,996 E , 5,609,537 N UTM NAD83 ZONE10
Elevation: 915.6 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	915.6					**TOPSOIL & ORGANICS** (0 to 0.4) ORGANICS, root inclusions; and TOPSOIL; Sandy; SILT; trace cobbles; trace gravel, fine to coarse grained, angular to subrounded, poorly graded, medium brown, non plastic, compact, dry, massive.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.4 m 0.4 m - C: 0.4 - 0.7 m
	915.0					**GRAVELLY SAND** (0.4 to 0.7) Gravelly SAND; some silt; trace cobbles, fine to coarse grained, angular to subrounded, well graded, light grey, dense, dry, massive.	
1.0						**GRAVELLY SILT** (0.7 to 2.9) Gravelly SILT; some cobbles; some sand, fine to coarse grained, subangular to subrounded, well graded, medium brown, non plastic, very dense, dry, massive. [Glacial Till]	
	914.0						
2.0							
	913.0						
3.0						End of Test Pit: 2.9 m Refusal on dense material	
	912.0						
4.0							
	911.0						
5.0							
	910.0						

GENERAL REMARKS:
Difficult to excavate, no groundwater, walls stable.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-337

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-338
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 23 Oct 14

Location: Haul Road
Total Depth: 3.5 m
Date Completed: 23 Oct 14

Coordinates: 686,191 E , 5,609,671 N UTM NAD83 ZONE10
Elevation: 932.4 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	932.0					**TOPSOIL & ORGANICS** (0 to 0.3) ORGANICS, root inclusions; and TOPSOIL; SILT; some sand; trace cobbles; trace gravel, fine to coarse grained, angular to subrounded, poorly graded, medium brown, non plastic, loose, dry, massive.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.3 m 0.3 m - C: 0.3 - 0.7 m
						GRAVELLY SAND (0.3 to 0.9) Gravelly SAND; some silt; trace cobbles, fine to coarse grained, subangular to rounded, well graded, light grey, non plastic, dense, dry.	
1.0	931.0					**GRAVELLY SANDY SILT** (0.9 to 3.5) Gravelly Sandy SILT: trace cobbles, fine to coarse grained, subangular to subrounded, poorly graded, non plastic, very dense, dry. [Glacial Till]	
2.0	930.0						
3.0	929.0					End of Test Pit: 3.5 m Refusal on dense material	
4.0	928.0						
5.0	927.0						

GENERAL REMARKS:
Difficult to excavate, no groundwater, walls stable.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-338

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-339
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 24 Oct 14

Location: Haul Road
Total Depth: 3.6 m
Date Completed: 24 Oct 14

Coordinates: 686,346 E , 5,609,951 N UTM NAD83 ZONE10
Elevation: 944.7 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	944.7					**TOPSOIL & ORGANICS** (0 to 0.2) ORGANICS, root inclusions; and TOPSOIL; SILT; some sand; trace cobbles; trace gravel, fine to coarse grained, subangular to rounded, gap graded, dark brown, loose, dry, massive.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.2 m 0.2 m - C: 0.2 - 0.6 m
	944.0					**SILTY SAND** (0.2 to 0.6) Silty SAND; some gravel; trace cobbles; fine to coarse grained, angular to subrounded, well graded, medium greyish brown, non plastic, dense, dry, massive.	
1.0						**GRAVELLY SANDY SILT** (0.6 to 3) gravelly Sandy SILT; trace cobbles; fine to coarse grained, angular to subrounded, poorly graded, dark greyish brown, non plastic, very dense, dry to moist, massive.	
	943.0						
2.0							
	942.0						
3.0						**WEATHERED BEDROCK** (3 to 3.6) Dark grey/orange, very strong, oxidization of joint surfaces, moderately weathered.	
	941.0					End of Test Pit: 3.6 m Refusal on weathered bedrock	
4.0							
	940.0						
5.0							
	939.0						

GENERAL REMARKS:
Difficult to excavate, no groundwater, walls stable.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-339

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-340
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 24 Oct 14

Location: EMRSF
Total Depth: 4 m
Date Completed: 24 Oct 14

Coordinates: 686,374 E , 5,610,113 N UTM NAD83 ZONE10
Elevation: 957.6 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	957.6					**TOPSOIL & ORGANICS** (0 to 0.4) ORGANICS, root inclusions; and TOPSOIL; SILT; some sand; trace cobbles; trace gravel, fine to coarse grained, poorly graded, dark brown, non plastic, loose to compact, dry, massive.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.4 m 0.4 m - C: 0.4 - 0.9 m
	957.0					**SANDY GRAVEL** (0.4 to 0.9) Sandy GRAVEL; some silt; some to trace cobbles, fine to coarse grained, subangular to rounded, well graded, non plastic, light grey, compact to dense, dry, massive.	
1.0						**GRAVELLY SAND AND SILT** (0.9 to 4) Gravelly SAND and SILT; trace cobbles, fine to coarse grained, subangular to subrounded, well graded, dark brown, low plasticity, very dense, moist, massive. [Glacial Till]	
	956.0						
2.0							
	955.0						
3.0							
	954.0						
4.0						End of Test Pit: 4 m Refusal on dense material	
	953.0						
5.0							
	952.0						

GENERAL REMARKS:
Difficult to excavate, no groundwater, walls stable.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-340

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-341
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 24 Oct 14

Location: Haul Road
Total Depth: 3.3 m
Date Completed: 24 Oct 14

Coordinates: 686,525 E , 5,610,184 N UTM NAD83 ZONE10
Elevation: 980 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	980.0					**TOPSOIL & ORGANICS** (0 to 0.3) ORGANICS, root inclusions; and TOPSOIL; SILT; some sand; trace cobbles; trace gravel, fine to coarse grained, subangular to rounded, poorly graded, medium to dark brown, non plastic, dense, dry, massive.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.3 m 0.3 m - C: 0.3 - 0.6 m
						GRAVELLY SAND (0.3 to 0.6) Gravelly SAND; some silt; trace cobbles; fine to coarse grained, angular to rounded, well graded, light grey, non plastic, dense, dry, massive.	
1.0	979.0					**GRAVELLY SILTY SAND** (0.6 to 3.3) Gravelly silty SAND; trace cobbles; fine to coarse grained, angular to rounded, well graded, medium to dark greyish brown, non to low plasticity, very dense, dry to moist, massive. [Glacial Till]	
2.0	978.0						
3.0	977.0					End of Test Pit: 3.3 m Refusal on dense material	
4.0	976.0						
5.0	975.0						

GENERAL REMARKS:
Difficult to excavate, no groundwater, walls stable.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-341

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Contractor: Cobra Contracting Ltd.
Location: EMRSF
Coordinates: 686,595 E , 5,610,007 N UTM NAD83 ZONE10

Test Pit No.: TP14-342
Equipment Used: CAT 320D L
Total Depth: 2.4 m
Elevation: 945 m

Page: 1 of 1
Date Started: 24 Oct 14
Date Completed: 24 Oct 14
Logged by: MAP
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	945.0					**TOPSOIL & ORGANICS** (0 to 0.4) ORGANICS, root inclusions; and TOPSOIL; SILT; trace gravel; trace sand, fine grained, subangular to rounded, poorly graded, very dark brown to black, loose, dry, massive.	0 m - A: 0 - 0.4 m 0.4 m - B: 0.4 - 1.2 m
						GRAVELLY SILT (0.4 to 1.2) gravelly SILT; trace cobbles; trace sand, fine grained, subangular to rounded, poorly graded, medium brown, compact, moist, massive. [Colluvium]	
1.0	944.0					**WEATHERED BEDROCK** (1.2 to 2.4) Medium grey/orange, highly weathered, highly fractured, oxidization on surfaces, strong.	
2.0	943.0						
						End of Test Pit: 2.4 m Refusal on weathered bedrock	
3.0	942.0						
4.0	941.0						
5.0	940.0						

GENERAL REMARKS:
Easy to excavate, no groundwater, walls stable.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-342

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-343
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 24 Oct 14

Location: EMRSF
Total Depth: 4.3 m
Date Completed: 24 Oct 14

Coordinates: 686,696 E , 5,609,861 N UTM NAD83 ZONE10
Elevation: 930.2 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	930.0					**TOPSOIL & ORGANICS** (0 to 0.4) ORGANICS, root inclusions; and TOPSOIL; SILT; some sand; trace gravel, fine to coarse grained, subangular to rounded, poorly graded, dark brown, loose to compact, dry.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.4 m 0.4 m - C: 0.4 - 0.9 m
						GRAVELLY SAND (0.4 to 0.9) Gravelly SAND; some silt; trace cobbles; fine to coarse grained, angular to subrounded, well graded, dense, light grey, non plastic, dry.	
1.0	929.0					**GRAVELLY SANDY SILT** (0.9 to 4.3) Gravelly Sandy SILT; trace cobbles; fine to coarse grained, angular to rounded, poorly graded, dark greyish brown, very dense, moist, massive. [Glacial Till]	
2.0	928.0						
3.0	927.0						
4.0	926.0	G B	TP14-343-1			End of Test Pit: 4.3 m Refusal on dense material	
5.0	925.0						

GENERAL REMARKS:
Easy to excavate, no groundwater, walls stable.

SAMPLING SYMBOLS:
G B GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-343

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-344
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 24 Oct 14

Location: EMRSF Water Management Pond
Total Depth: 3.9 m
Date Completed: 24 Oct 14

Coordinates: 687,197 E , 5,609,561 N UTM NAD83 ZONE10
Elevation: 880.3 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	880.0					**TOPSOIL & ORGANICS** (0 to 0.2) ORGANICS, root inclusions; and TOPSOIL; SILT; some sand; trace gravel, fine to coarse grained, subangular to rounded, poorly graded, dark brown, loose to compact, dry.	0 m - A: None 0.1 m - B: 0 - 1 m
						SILT (0.2 to 1) SILT; some sand, poorly graded, brown, medium plasticity, dense, massive. [Loess]	
1.0	879.0					**SANDY GRAVEL** (1 to 1.5) Sandy GRAVEL; some silt; trace cobbles, fine to coarse grained, subangular to rounded, well graded, grey/brown, loose, dry. [Glaciofluvial]	
						GRAVELLY SANDY SILT (1.5 to 3.9) Gravelly Sandy SILT; trace cobbles, fine to coarse grained, subangular to rounded, poorly graded, dark brown, low to medium plasticity, very dense, moist, massive. [Glacial Till]	
2.0	878.0						
3.0	877.0	G B	TP14-344-1				
4.0	876.0					End of Test Pit: 3.9 m Refusal on boulder	
5.0	875.0						

GENERAL REMARKS:
Easy to excavate, no groundwater, walls sloughing slightly from 1 - 1.5 m.

SAMPLING SYMBOLS:
G B GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-344

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-345
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 25 Oct 14

Location: EMRSF Water Management Pond
Total Depth: 4.3 m
Date Completed: 25 Oct 14

Coordinates: 687,051 E , 5,609,455 N UTM NAD83 ZONE10
Elevation: 883.5 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	883.0					**TOPSOIL & ORGANICS** (0 to 0.3) ORGANICS, root inclusions; and TOPSOIL; Sandy; SILT; trace cobbles; trace gravel, fine to coarse grained, subangular to rounded, poorly graded, medium to dark brown, non plastic, compact, dry.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.3 m 0.3 m - C: 0.3 - 1.2 m
1.0	882.0					**GRAVELLY SAND** (0.3 to 1.2) Gravelly SAND; trace cobbles; trace sand, fine to coarse grained, angular to subrounded, well graded, light greyish brown, non plastic, dense, dry, massive.	
2.0	881.0					**GRAVELLY SANDY SILT** (1.2 to 4.3) Gravelly Sandy SILT; trace cobbles, fine to coarse grained, subangular to rounded, poorly graded, dark greyish brown, very dense, low to medium plasticity, moist, massive. [Glacial Till]	
3.0	880.0						
4.0	879.0					End of Test Pit: 4.3 m Refusal on dense material	
5.0	878.0						

GENERAL REMARKS:
Difficult to excavate, no groundwater, walls stable.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-345

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-346
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 25 Oct 14

Location: EMRSF Water Management Pond
Total Depth: 4.7 m
Date Completed: 25 Oct 14

Coordinates: 687,252 E , 5,609,421 N UTM NAD83 ZONE10
Elevation: 878 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0						**TOPSOIL & ORGANICS** (0 to 0.3) ORGANICS, root inclusions; and TOPSOIL; SILT; some sand; trace gravel, fine to coarse grained, subangular to rounded, poorly graded, medium to dark brown, non plastic, compact, dry.	0 m - A: 0 - 0.3 m
						GRAVEL (0.3 to 1.1) GRAVEL; some sand; some silt; trace cobbles, subangular to rounded, well graded, grey, compact, dry, massive, trace organics.	
1.0	877.0					**SILTY SAND** (1.1 to 4.7) Silty SAND; trace gravel, fine grained, poorly graded, light greyish brown, non plastic, compact, dry, massive. [Glaciolacustrine]	
2.0	876.0						
3.0	875.0						
4.0	874.0	G B	TP14-346-1				
						End of Test Pit: 4.7 m Limit of excavator	
5.0	873.0						

GENERAL REMARKS:
Very easy to excavate, no groundwater, walls sloughing from 0.3 - 1.1 m.

SAMPLING SYMBOLS:
G B GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-346

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-347
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 25 Oct 14

Location: EMRSF
Total Depth: 3.2 m
Date Completed: 25 Oct 14

Coordinates: 687,350 E , 5,609,722 N UTM NAD83 ZONE10
Elevation: 886.8 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	886.8					**TOPSOIL & ORGANICS** (0 to 0.5) ORGANICS, root inclusions; and TOPSOIL; Sandy; SILT; trace cobbles; trace gravel, fine to coarse grained, subangular to rounded, gap graded, medium brown, compact, dry, massive.	0 m - A: 0 - 0.05 m 0.05 m - B: 0.05 - 0.5 m
1.0	886.0					**GRAVELLY SANDY SILT** (0.5 to 3.2) Gravelly Sandy SILT; trace cobbles; trace boulders, fine to coarse grained, angular to rounded, poorly graded, medium greyish brown, very dense, dry. [Glacial Till]	
2.0	885.0						
3.0	884.0						
3.2	883.6					End of Test Pit: 3.2 m Refusal on dense material	
4.0	883.0						
5.0	882.0						
	881.0						

GENERAL REMARKS:
Difficult to excavate, no groundwater, walls stable.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-347

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Contractor: Cobra Contracting Ltd.
Location: EMRSF
Coordinates: 687,454 E , 5,609,859 N UTM NAD83 ZONE10

Test Pit No.: TP14-348
Equipment Used: CAT 320D L
Total Depth: 2.5 m
Elevation: 902.7 m

Page: 1 of 1
Date Started: 25 Oct 14
Date Completed: 25 Oct 14
Logged by: MAP
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	902.7					**TOPSOIL & ORGANICS** (0 to 0.4) ORGANICS, root inclusions; and TOPSOIL; SILT; some sand; trace cobbles; trace gravel, fine to coarse grained, subangular to rounded, gap graded, dark brown, non plastic, compact, dry.	0 m - A: 0 - 0.4 m 0.4 m - B: 0.4 - 0.9 m
	902.0					**SILT** (0.4 to 0.9) SILT; some sand; trace cobbles; trace gravel, fine to coarse grained, subangular to rounded, gap graded, medium brown, non plastic, compact to dense, dry.	0.9 m - C: 0.9 - 1.1 m
1.0						**GRAVELLY SAND** (0.9 to 1.1) Gravelly SAND; some silt; trace cobbles, fine to coarse grained, angular to subrounded, well graded, light grey, non plastic, dense, dry.	
	901.0					**GRAVELLY SANDY SILT** (1.1 to 2.5) Gravelly Sandy SILT: trace cobbles; trace boulders, fine to coarse grained, angular to rounded, well graded, dark greyish brown, non plastic, very dense, dry, massive. [Glacial Till]	
2.0							
	900.0					End of Test Pit: 2.5 m Refusal on dense material, possibly bedrock	
3.0							
	899.0						
4.0							
	898.0						
5.0							
	897.0						

GENERAL REMARKS:
Difficult to excavate, no groundwater, walls stable.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-348

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Contractor: Cobra Contracting Ltd.
Location: EMRSF
Coordinates: 687,226 E , 5,610,040 N UTM NAD83 ZONE10

Test Pit No.: TP14-349
Equipment Used: CAT 320D L
Total Depth: 4.3 m
Elevation: 910.5 m

Page: 1 of 1
Date Started: 25 Oct 14
Date Completed: 25 Oct 14
Logged by: MAP
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	910.0					**TOPSOIL & ORGANICS** (0 to 0.3) ORGANICS, root inclusions; and TOPSOIL; SILT; trace gravel; trace sand, fine grained, subangular to rounded, poorly graded, medium brown, non plastic, loose to compact, dry.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.3 m
						GRAVELLY SANDY SILT (0.3 to 4.3) Gravelly Sandy SILT: trace cobbles; trace boulders, gap graded, dark greyish brown, very dense, low to medium plasticity, moist, massive. [Glacial Till]	
1.0	909.0						
2.0	908.0						
3.0	907.0						
4.0	906.0					End of Test Pit: 4.3 m Limit of excavator	
5.0	905.0						

GENERAL REMARKS:
Difficult to excavate, no groundwater, walls stable.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-349

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-350
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 27 Oct 14

Location: EMRSF
Total Depth: 5 m
Date Completed: 27 Oct 14

Coordinates: 687,354 E , 5,610,245 N UTM NAD83 ZONE10
Elevation: 941 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
						TOPSOIL & ORGANICS (0 to 0.1) ORGANICS, root inclusions; and TOPSOIL; SILT; some sand; trace gravel, fine to coarse grained, subangular to rounded, poorly graded, dark brown, non plastic, loose, dry.	0 m - A: 0 - 0.1 m
						GRAVELLY SAND AND SILT (0.1 to 5) Gravelly SILT and SAND; trace cobbles, fine to coarse grained, angular to subrounded, gap graded, medium orangey brown, non plastic, dense to very dense, dry, massive. [Glaciofluvial]	
1.0	940.0						
2.0	939.0						
3.0	938.0						
4.0	937.0						
5.0	936.0					End of Test Pit: 5 m Limit of excavator	

GENERAL REMARKS:
Difficult to excavate, no groundwater, walls stable.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-350

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Contractor: Cobra Contracting Ltd.
Location: EMRSF
Coordinates: 687,446 E , 5,610,601 N UTM NAD83 ZONE10

Test Pit No.: TP14-351
Equipment Used: CAT 320D L
Total Depth: 2.7 m
Elevation: 959.8 m

Page: 1 of 1
Date Started: 27 Oct 14
Date Completed: 27 Oct 14
Logged by: MAP
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	959.8					**TOPSOIL & ORGANICS** (0 to 0.3) ORGANICS, root inclusions; and TOPSOIL; SILT; some sand; trace gravel, fine to coarse grained, angular to subrounded, poorly graded, dark brown, non plastic, loose, dry, massive .	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.3 m 0.3 m - C: 0.3 - 0.8 m
1.0	959.0					**SAND** (0.3 to 0.8) SAND; some gravel; some silt; trace cobbles, fine to coarse grained, angular to subrounded, well graded, light greyish brown, non plastic, dense, dry, massive.	
2.0	958.0					**WEATHERED BEDROCK** (0.8 to 2.7) Completely weathered bedrock, resembles angular fine to coarse grained, gravelly SAND, orangey brown/grey, very dense, dry.	
3.0	957.0					End of Test Pit: 2.7 m Refusal on bedrock	
4.0	956.0						
5.0	955.0						
	954.0						

GENERAL REMARKS:
Difficult to excavate, no groundwater, walls stable.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-351

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, TEST PIT LOG, 2014 KP DATA TEMPLATE REVB.GDT, 17-Mar-15

Project: AJAX PROJECT
Contractor: Cobra Contracting Ltd.
Location: EMRSF
Coordinates: 687,273 E , 5,610,805 N UTM NAD83 ZONE10

Test Pit No.: TP14-352
Equipment Used: CAT 320D L
Total Depth: 4.9 m
Elevation: 937.3 m

Page: 1 of 1
Date Started: 27 Oct 14
Date Completed: 27 Oct 14
Logged by: MAP
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	937.0					**TOPSOIL & ORGANICS** (0 to 0.3) ORGANICS, root inclusions; and TOPSOIL; SILT; some sand; trace gravel, fine to coarse grained, subangular to rounded, poorly graded, dark brown, loose to compact, dry.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.3 m
						SILT (0.3 to 1.1) SILT; some sand; trace cobbles; trace gravel, fine to coarse grained, subangular to rounded, poorly graded, medium brown, dense, dry.	
1.0	936.0					**SILT** (1.1 to 4.9) SILT; some sand; trace cobbles; trace gravel; trace clay; fine grained, subangular to subrounded, poorly graded, light brown, low plasticity, dense, dry to slightly moist. [Glaciolacustrine]	
2.0	935.0						
3.0	934.0						
4.0	933.0						
5.0	932.0					End of Test Pit: 4.9 m Limit of excavator	

GENERAL REMARKS:
Difficult to excavate, no groundwater, walls stable.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-352

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-353
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 27 Oct 14

Location: EMRSF
Total Depth: 4.7 m
Date Completed: 27 Oct 14

Coordinates: 687,049 E , 5,610,555 N UTM NAD83 ZONE10
Elevation: 951.3 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	951.0					**TOPSOIL & ORGANICS** (0 to 0.3) ORGANICS, root inclusions; and TOPSOIL; SILT; some sand; trace cobbles; trace gravel, fine to coarse grained, subangular to rounded, gap graded, medium to dark brown, non plastic, loose to compact, dry, massive.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.3 m 0.3 m - C: 0.3 - 0.5 m
						GRAVELLY SAND (0.3 to 0.5) Gravelly SAND; some silt; trace cobbles; fine to coarse grained, subangular to subrounded, well graded, grey/brown, compact, dry, non plastic.	
1.0	950.0					**GRAVELLY SANDY SILT** (0.5 to 4.7) Gravelly Sandy SILT; trace cobbles; trace clay, fine to coarse grained, well graded, subangular to rounded, dark greyish brown, low plasticity, very dense, moist, massive. [Glacial Till]	
2.0	949.0						
3.0	948.0						
4.0	947.0						
4.7	946.6					End of Test Pit: 4.7 m Limit of excavator	
5.0	946.0						

GENERAL REMARKS:
Difficult to excavate, no groundwater, walls stable.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-353

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Contractor: Cobra Contracting Ltd.
Location: EMRSF
Coordinates: 687,105 E , 5,610,305 N UTM NAD83 ZONE10

Test Pit No.: TP14-354
Equipment Used: CAT 320D L
Total Depth: 4.5 m
Elevation: 931.5 m

Page: 1 of 1
Date Started: 27 Oct 14
Date Completed: 27 Oct 14
Logged by: MAP
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	931.0					**TOPSOIL & ORGANICS** (0 to 0.3) ORGANICS, root inclusions; and TOPSOIL; SILT; some sand; trace gravel, fine to coarse grained, subangular to rounded, poorly graded, dark to medium brown, non plastic, loose, dry.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.3 m
						GRAVELLY SAND (0.3 to 0.9) Gravelly SAND; some silt; trace cobbles; fine to coarse grained, angular to subrounded, well graded, non plastic, dense, medium orangey brown, dry.	
1.0	930.0					**GRAVELLY SILT** (0.9 to 4.5) gravelly SILT; some sand; trace boulders; trace cobbles, fine to coarse grained, subangular to subrounded, well graded, dark greyish brown, low to no plasticity, very dense, moist, massive. [Glacial Till]	
2.0	929.0						
3.0	928.0						
4.0	927.0					End of Test Pit: 4.5 m Limit of excavator	
5.0	926.0						

GENERAL REMARKS:
Difficult to excavate, no groundwater, walls stable.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-354

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-355
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 28 Oct 14

Location: EMRSF
Total Depth: 4.4 m
Date Completed: 28 Oct 14

Coordinates: 686,756 E , 5,610,351 N UTM NAD83 ZONE10
Elevation: 955.1 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	955.0					**TOPSOIL & ORGANICS** (0 to 0.6) ORGANICS, root inclusions; and TOPSOIL; SILT; some sand; trace cobbles; trace gravel, fine to coarse grained, subangular to rounded, poorly graded, dark to medium brown, loose to compact, dry, massive.	0 m - A: 0 - 0.3 m 0.3 m - B: 0.3 - 0.6 m
1.0	954.0					**GRAVELLY SILT** (0.6 to 4.4) Gravelly SILT; some sand; trace cobbles, fine to coarse grained, angular to subrounded, well graded, dark greyish brown, very dense, moist, massive. [Glacial Till]	
2.0	953.0						
3.0	952.0						
4.0	951.0					End of Test Pit: 4.4 m Limit of excavator	
5.0	950.0						

GENERAL REMARKS:
Difficult to excavate, no groundwater, walls stable.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-355

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-356
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 28 Oct 14

Location: EMRSF
Total Depth: 3.9 m
Date Completed: 28 Oct 14

Coordinates: 686,598 E , 5,610,466 N UTM NAD83 ZONE10
Elevation: 985.4 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	985.0					**TOPSOIL & ORGANICS** (0 to 0.3) ORGANICS, root inclusions; and TOPSOIL; Sandy; SILT; trace gravel, fine to coarse grained, subangular to rounded, poorly graded, dark to medium brown, non plastic, loose to compact, dry.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.3 m
						GRAVELLY SANDY SILT (0.3 to 2) Gravelly sandy SILT; trace cobbles, fine to coarse grained, angular to subrounded, well graded, light greyish brown, non plastic, very dense, dry.	
1.0	984.0						
2.0	983.0					**GRAVELLY SANDY SILT** (2 to 3.9) Gravelly Sandy SILT; trace cobbles, fine to coarse grained, angular to subrounded, well graded, low plasticity, dark greyish brown, very dense, moist, massive. [Glacial Till]	
3.0	982.0	G B	TP14-356-1				
4.0	981.0					End of Test Pit: 3.9 m Refusal on dense material	
5.0	980.0						

GENERAL REMARKS:
Difficult to excavate, no groundwater, walls stable.

SAMPLING SYMBOLS:
G B GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-356

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-357
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 28 Oct 14

Location: EMRSF
Total Depth: 4.9 m
Date Completed: 28 Oct 14

Coordinates: 686,654 E , 5,610,601 N UTM NAD83 ZONE10
Elevation: 981.2 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	981.0					**TOPSOIL & ORGANICS** (0 to 0.4) ORGANICS, root inclusions; and TOPSOIL; SILT; some sand; trace cobbles; trace gravel, fine to coarse grained, angular to subrounded, poorly graded, dark to medium brown, non plastic, loose to compact, dry, massive.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.4 m
						GRAVELLY SILT (0.4 to 4.9) gravelly SILT; some sand; trace cobbles, fine to coarse grained, angular to subrounded, well graded, non plastic, dark greyish brown, very dense, moist, massive. [Glacial Till]	
1.0	980.0						
2.0	979.0						
3.0	978.0						
4.0	977.0						
4.9						End of Test Pit: 4.9 m Limit of excavator	
5.0	976.0						

GENERAL REMARKS:
Difficult to excavate, no groundwater, walls stable.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-357

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Contractor: Cobra Contracting Ltd.
Location: EMRSF
Coordinates: 686,299 E , 5,610,647 N UTM NAD83 ZONE10

Test Pit No.: TP14-358
Equipment Used: CAT 320D L
Total Depth: 5 m
Elevation: 1011 m

Page: 1 of 1
Date Started: 28 Oct 14
Date Completed: 28 Oct 14
Logged by: MAP
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0						**TOPSOIL & ORGANICS** (0 to 0.3) ORGANICS, root inclusions; and TOPSOIL; SILT; some sand; trace cobbles; trace gravel, fine to coarse grained, subangular to rounded, poorly graded, dark to medium brown, non plastic, loose to compact, dry.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.3 m 0.3 m - C: 0.3 - 0.6 m
						GRAVELLY SAND (0.3 to 0.6) Gravelly SAND; some silt; trace cobbles; fine to coarse grained, angular to subrounded, well graded, light grey, non plastic, dense, dry.	
1.0	1010.0					**GRAVELLY SILT** (0.6 to 5) Gravelly SILT: some sand; trace cobbles, fine to coarse grained, subangular to rounded, well graded, dark greyish brown, low to no plasticity, very dense, moist, massive. [Glacial Till]	
2.0	1009.0						
3.0	1008.0						
4.0	1007.0						
5.0	1006.0					End of Test Pit: 5 m Limit of excavator	

GENERAL REMARKS:
Difficult to excavate, no groundwater, walls stable.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-358

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, TEST PIT LOG, 2014 KP DATA TEMPLATE REVB.GDT, 17-Mar-15

Project: AJAX PROJECT
Test Pit No.: TP14-359
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 30 Oct 14

Location: EMRSF
Total Depth: 5.1 m
Date Completed: 30 Oct 14

Coordinates: 686,257 E , 5,610,441 N UTM NAD83 ZONE10
Elevation: 994.5 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	994.0					**TOPSOIL & ORGANICS** (0 to 0.3) ORGANICS, root inclusions; and TOPSOIL; SILT; some sand; trace cobbles; trace gravel, fine to coarse grained, subangular to rounded, poorly graded, dark to medium brown, non plastic, loose to compact, dry, massive.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.3 m 0.3 m - C: 0.3 - 0.5 m
						GRAVELLY SAND AND SILT (0.3 to 0.5) Gravelly SAND and SILT; trace cobbles, fine to coarse grained, angular to subrounded, well graded, light greyish brown, non plastic, compact to dense, dry, massive.	
1.0						**GRAVELLY SILT** (0.5 to 5.1) Gravelly SILT; some cobbles; trace sand; fine to coarse grained, subangular to rounded, well graded, dark greyish brown, very dense, low to medium plasticity, moist, massive. [Glacial Till]	
2.0	993.0						
	992.0						
3.0							
	991.0						
4.0							
	990.0						
5.0						End of Test Pit: 5.1 m Limit of excavator	
	989.0						

GENERAL REMARKS:
Difficult to excavate, no groundwater, walls stable.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-359

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-360
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 30 Oct 14

Location: EMRSF
Total Depth: 4.7 m
Date Completed: 30 Oct 14

Coordinates: 685,989 E , 5,610,430 N UTM NAD83 ZONE10
Elevation: 962.5 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	962.0					**TOPSOIL & ORGANICS** (0 to 0.3) ORGANICS, root inclusions; and TOPSOIL; Sandy; SILT; trace cobbles; trace gravel, fine to coarse grained, angular to subrounded, poorly graded, dark to medium brown, non plastic, loose to compact, dry.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.3 m 0.3 m - C: 0.3 - 0.6 m
						SAND (0.3 to 0.6) SAND; some gravel; some silt; trace cobbles, fine to coarse grained, angular to subrounded, well graded, light greyish brown, dense, dry, massive.	
1.0						**GRAVELLY SILT** (0.6 to 4.7) gravelly SILT; some sand; trace cobbles, fine to coarse grained, angular to subrounded, gap graded, dark greyish brown, low to no plasticity, very dense, moist, massive. [Glacial Till]	
	961.0	G B	GP14-017				
2.0							
	960.0						
3.0							
	959.0						
4.0							
	958.0						
5.0						End of Test Pit: 4.7 m Limit of excavator	
	957.0						

GENERAL REMARKS:
Difficult to excavate, no groundwater, walls stable.

SAMPLING SYMBOLS:
G B GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-360

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-361
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 30 Oct 14

Location: Haul Road
Total Depth: 5.1 m
Date Completed: 30 Oct 14

Coordinates: 685,765 E , 5,610,431 N UTM NAD83 ZONE10
Elevation: 959.9 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	959.9					**TOPSOIL & ORGANICS** (0 to 0.2) ORGANICS, root inclusions; and TOPSOIL; SILT; some sand; trace gravel, fine to coarse grained, subangular to rounded, poorly graded, dark to medium brown, non plastic, compact to loose, dry, massive.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.2 m
						SANDY SILT (0.2 to 0.8) Sandy SILT; trace cobbles; trace gravel, fine to coarse grained, angular to subrounded, poorly graded, non plastic, medium brown, dense, dry.	
1.0	959.0					**GRAVELLY SILT** (0.8 to 5.1) gravelly SILT; some sand; trace boulders; trace cobbles, fine to coarse grained, angular to subrounded, poorly/gap graded, dark greyish brown, very dense, moist, low to medium plasticity, massive. [Glacial Till]	
2.0	958.0						
3.0	957.0						
4.0	956.0						
5.0	955.0					End of Test Pit: 5.1 m Limit of excavator	
	954.0						

GENERAL REMARKS:
Difficult to excavate, no groundwater, walls stable.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-361

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, TEST PIT LOG, 2014 KP DATA TEMPLATE REVB.GDT, 17-Mar-15

Project: AJAX PROJECT
Test Pit No.: TP14-362
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 30 Oct 14

Location: EMRSF
Total Depth: 4.8 m
Date Completed: 30 Oct 14

Coordinates: 685,789 E , 5,610,610 N UTM NAD83 ZONE10
Elevation: 981.9 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	981.9					**TOPSOIL & ORGANICS** (0 to 0.5) ORGANICS, root inclusions; and TOPSOIL; SILT; some sand; trace cobbles; trace gravel, fine to coarse grained, subangular to rounded, poorly graded, dark to medium brown, non plastic, loose to compact, dry, massive.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1-0.5 m
						SAND (0.5 to 0.9) SAND; some silt; trace cobbles; trace gravel, fine to coarse grained, angular to subrounded, well graded, medium greyish brown, non plastic, dense, dry, massive.	0.5 m - C: 0.5 - 0.9 m
1.0	981.0					**GRAVELLY SILT** (0.9 to 4.8) gravelly SILT; some sand; trace cobbles, fine to coarse grained, angular to subrounded, gap graded, dark greyish brown, low plasticity, dark greyish brown, very dense, moist, massive. [Glacial Till]	
2.0	980.0						
3.0	979.0						
4.0	978.0	G B	TP14-362-1				
5.0	977.0					End of Test Pit: 4.8 m Limit of excavator	
	976.0						

GENERAL REMARKS:
Difficult to excavate, no groundwater, walls stable.

SAMPLING SYMBOLS:
G B GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-362

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-363
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 30 Oct 14

Location: Haul Road
Total Depth: 5 m
Date Completed: 30 Oct 14

Coordinates: 685,426 E , 5,610,649 N UTM NAD83 ZONE10
Elevation: 969.9 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	969.0					**TOPSOIL & ORGANICS** (0 to 0.3) ORGANICS, root inclusions; and TOPSOIL; SILT; some sand; trace cobbles; trace gravel, fine to coarse grained, subangular to rounded, gap graded, dark brown, non plastic, compact, dry.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1-0.3 m 0.3 m - C: 0.3 - 0.7 m
						SAND (0.3 to 0.7) SAND; some gravel; some silt; trace cobbles, fine to coarse grained, angular to subrounded, well graded, light grey, non plastic, dense, dry, massive. [Loess]	
1.0						**SANDY GRAVELLY SILT** (0.7 to 5) Sandy Gravelly SILT; trace cobbles; fine to coarse grained, angular to subrounded, poorly graded, dark greyish brown, dense, moist, massive. [Glacial Till]	
2.0	968.0						
3.0	967.0						
4.0	966.0						
5.0	965.0					End of Test Pit: 5 m Limit of excavator	
	964.0						

GENERAL REMARKS:
Difficult to excavate, no groundwater, walls stable.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-363

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-364
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 30 Oct 14

Location: Haul Road
Total Depth: 3 m
Date Completed: 30 Oct 14

Coordinates: 685,000 E , 5,610,698 N UTM NAD83 ZONE10
Elevation: 950.4 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	950.0					**TOPSOIL & ORGANICS** (0 to 0.5) ORGANICS, root inclusions; and TOPSOIL; SILT; some sand; trace cobbles; trace gravel, fine to coarse grained, subangular to rounded, poorly graded, dark brown, non plastic, loose to compact, dry to moist, massive.	0 m - A: 0 - 0.3 m 0.3 m - B: 0.3 - 1.4 m
1.0	949.0					**SILT** (0.5 to 3) SILT; some sand; trace cobbles; trace gravel, fine to coarse grained, subangular to rounded, poorly graded, medium brown, dense, dry. [Loess]	
2.0	948.0						
3.0	947.0					**WEATHERED BEDROCK** (3 to 3) Dark grey/green, strong, slightly weathered, chlorite/calcite on surfaces. End of Test Pit: 3 m Refusal on bedrock	
4.0	946.0						
5.0	945.0						

GENERAL REMARKS:
Easy to excavate, no groundwater, walls stable.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-364

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-365
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 31 Oct 14

Location: Haul Road
Total Depth: 2 m
Date Completed: 31 Oct 14

Coordinates: 684,411 E , 5,610,617 N UTM NAD83 ZONE10
Elevation: 956.8 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	956.8					**TOPSOIL & ORGANICS** (0 to 0.3) ORGANICS, root inclusions; and TOPSOIL; SILT and SAND; trace gravel, fine to coarse grained, subangular to rounded, poorly graded, dark greyish brown, non plastic, loose, dry.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.3 m
						SAND AND SILT (0.3 to 0.8) SAND and SILT; trace gravel, fine to coarse grained, subangular to rounded, poorly graded, medium greyish brown, non plastic, compact, dry.	
1.0	956.0					**WEATHERED BEDROCK** (0.8 to 2) Highly to completely weathered bedrock, light grey to white, some chlorite/calcite infill and minor iron oxide staining, weak.	
	955.0						
2.0						End of Test Pit: 2 m Refusal on weathered bedrock	
	954.0						
3.0							
	953.0						
4.0							
	952.0						
5.0							
	951.0						

GENERAL REMARKS:
Easy to excavate up to 1 m, no groundwater, walls stable.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-365

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-366
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 31 Oct 14

Location: Sand and Gravel Borrow Area
Total Depth: 5 m
Date Completed: 31 Oct 14

Coordinates: 684,326 E , 5,610,417 N UTM NAD83 ZONE10
Elevation: 977.4 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	977.0					**TOPSOIL & ORGANICS** (0 to 0.1) ORGANICS, root inclusions; and TOPSOIL; SAND; some silt; trace gravel, fine to coarse grained, subangular to rounded, poorly graded, medium brown, non plastic, loose, dry, massive.	0 m - A: 0 - 0.1 m
1.0	976.0					**GRAVELLY SAND AND SILT** (0.1 to 1.5) Gravelly SAND and SILT; trace boulders; trace cobbles; fine to coarse grained, angular to subrounded, well graded, light greyish brown, non plastic, compact, dry, massive. [Mine Rock]	
2.0	975.0					**GRAVELLY SILT** (1.5 to 5) gravelly SILT; some sand; trace cobbles, fine to coarse grained, angular to subrounded, gap graded, non plastic, very dense, moist, massive. [Mine Rock]	
3.0	974.0						
4.0	973.0						
5.0	972.0					End of Test Pit: 5 m Limit of excavator	

GENERAL REMARKS:
Located on historic waste rock facility, difficult to excavate, no groundwater, walls stable.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-366

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-367
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 31 Oct 14

Location: Sand and Gravel Borrow Area
Total Depth: 5.5 m
Date Completed: 31 Oct 14

Coordinates: 684,473 E , 5,610,232 N UTM NAD83 ZONE10
Elevation: 977.9 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	977.9					**TOPSOIL & ORGANICS** (0 to 0.1) ORGANICS, root inclusions; and TOPSOIL; SILT; trace gravel; trace sand; fine grained, subangular to rounded, poorly graded, dark brown, non plastic, loose, dry.	0 m - A: 0 - 0.1 m
						SAND AND SILT (0.1 to 2) SILT and SAND; some gravel; trace boulders; trace cobbles, fine to coarse grained, angular to subrounded, poorly graded, light greyish brown, non plastic, dense, dry, massive.	
1.0	977.0	G B	TP14-367-1				
2.0	976.0					**WASTE ROCK** (2 to 5.5) Gravel and cobbles; some sand; medium grey, fresh to slightly weathered, minimal infill/staining, angular [Mine Rock]	
3.0	975.0						
4.0	974.0						
5.0	973.0					End of Test Pit: 5.5 m Limit of excavator	
	972.0						

GENERAL REMARKS:
Located on historic waste rock facility, easy to excavate, no groundwater, walls stable.

SAMPLING SYMBOLS:
G B GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-367

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT

Test Pit No.: TP14-368 **Page:** 1 of 1

Contractor: Cobra Contracting Ltd. Equipment Used: CAT 320D L Date Started: 31 Oct 14

Location: Sand and Gravel Borrow Area Total Depth: 4.5 m Date Completed: 31 Oct 14

Coordinates: 684,068 E , 5,610,316 N UTM NAD83 ZONE10 Elevation: 970 m Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
						TOPSOIL & ORGANICS (0 to 0.6) ORGANICS, root inclusions; and TOPSOIL; SAND and SILT; some gravel; trace cobbles, fine to coarse grained, angular to subrounded, poorly graded, light greyish brown, non plastic, loose, dry, massive.	0 m - A: 0 - 0.1 m
1.0	969.0					**WASTE ROCK** (0.6 to 4.5) Gravel and cobble; some sand; light grey, fresh to slightly weathered, minimal staining/oxidization. [Mine Rock]	
2.0	968.0						
3.0	967.0						
4.0	966.0						
						End of Test Pit: 4.5 m Wall instability	
5.0	965.0						

GENERAL REMARKS:

Located on historic waste rock facility, easy to excavate, no groundwater, walls sloughing.

SAMPLING SYMBOLS:

GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-368

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-369
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 31 Oct 14

Location: Sand and Gravel Borrow Area
Total Depth: 4.8 m
Date Completed: 31 Oct 14

Coordinates: 683,899 E , 5,610,350 N UTM NAD83 ZONE10
Elevation: 968.1 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	968.0					**TOPSOIL & ORGANICS** (0 to 0.2) ORGANICS, root inclusions; and TOPSOIL; Sandy; SILT; trace gravel, fine to coarse grained, angular to subrounded, poorly graded, medium brown, non plastic, loose, dry.	0 m - A: 0 - 0.1 m
						GRAVELLY SAND (0.2 to 4.8) Gravelly SAND; trace cobbles; trace boulders; fine to coarse grained, angular to subrounded, well graded, light greyish brown, non plastic, compact, dry, massive. [Mine Rock]	
1.0	967.0						
2.0	966.0						
3.0	965.0						
4.0	964.0	G B	TP14-369-1				
4.8	963.2					End of Test Pit: 4.8 m Limit of excavator	
5.0	963.0						

GENERAL REMARKS:
Located on historic waste rock facility, easy to excavate up to 1 m, no groundwater, walls sloughing.

SAMPLING SYMBOLS:
G B GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-369

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-370
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 31 Oct 14

Location: Sand and Gravel Borrow Area
Total Depth: 3 m
Date Completed: 31 Oct 14

Coordinates: 683,952 E , 5,610,126 N UTM NAD83 ZONE10
Elevation: 965.8 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	965.0					**TOPSOIL & ORGANICS** (0 to 0.1) ORGANICS, root inclusions; and TOPSOIL; SILT; some sand, fine to coarse grained, subangular to rounded, poorly graded, medium brown, loose, dry.	0 m - A: 0 - 0.1 m
						SILTY GRAVELLY SAND (0.1 to 1) Silty gravelly SAND; trace cobbles, fine to coarse grained, angular to subrounded, gap graded, light greyish brown, non plastic, loose, dry, massive.	
1.0						**WASTE ROCK** (1 to 3) Gravel and cobbles; some sand; light grey, fresh to slightly weathered, strong, minimal infill/oxidization. [Mine Rock]	
2.0	964.0						
	963.0						
3.0						End of Test Pit: 3 m Wall instability	
4.0	962.0						
	961.0						
5.0							
	960.0						

GENERAL REMARKS:
Located on historic waste rock facility, easy to excavate up to 1 m, no groundwater, walls sloughing.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-370

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-371
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 31 Oct 14

Location: Sand and Gravel Borrow Area
Total Depth: 4.4 m
Date Completed: 31 Oct 14

Coordinates: 683,742 E , 5,610,239 N UTM NAD83 ZONE10
Elevation: 967.9 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	967.9					**TOPSOIL & ORGANICS** (0 to 0.1) ORGANICS, root inclusions; and TOPSOIL; Sandy; SILT; trace gravel, fine to coarse grained, subangular to rounded, poorly graded, medium brown, loose, dry, massive.	0 m - A: 0 - 0.1 m
						SILTY SAND (0.1 to 3) Silty SAND; some gravel; trace cobbles, fine to coarse grained, angular to subrounded, well graded, light grey, compact, dry, massive. [Mine Rock]	
1.0	967.0						
2.0	966.0						
3.0	965.0					**SILT** (3 to 4.4) SILT; some gravel; some sand; trace cobbles, fine to coarse grained, angular to subrounded, well graded, dark grey, low plasticity, moist. [Mine Rock]	
4.0	964.0						
						End of Test Pit: 4.4 m Limit of excavator	
5.0	963.0						
	962.0						

GENERAL REMARKS:
Located on historic waste rock facility, easy to excavate, no groundwater, walls stable.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-371

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Contractor: Cobra Contracting Ltd.
Location: Sand and Gravel Borrow Area
Coordinates: 683,499 E , 5,609,370 N UTM NAD83 ZONE10

Test Pit No.: TP14-372
Equipment Used: CAT 320D L
Total Depth: 4.2 m
Elevation: 902 m

Page: 1 of 1
Date Started: 1 Nov 14
Date Completed: 1 Nov 14
Logged by: MAP
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
						TOPSOIL & ORGANICS (0 to 0.1) ORGANICS, root inclusions; and TOPSOIL; Sandy; SILT; trace gravel, fine to coarse grained, angular to subrounded, poorly graded, dark brown, loose, dry.	0 m - A: 0 - 0.1 m
						SAND (0.1 to 0.6) SAND; some gravel; some silt; trace cobbles, fine to coarse grained, angular to subrounded, poorly graded, light grey, dense, dry, massive.	
1.0	901.0					**WASTE ROCK** (0.6 to 4.2) Gravel and Cobbles, some sand, angular, light grey, slightly weathered to fresh, strong, minimal infill and staining. [Mine Rock]	
2.0	900.0						
3.0	899.0						
4.0	898.0	GB	TP14-372-1			End of Test Pit: 4.2 m Wall instability	
5.0	897.0						

GENERAL REMARKS:
Located on historic waste rock facility, difficult to excavate bouldery material, no groundwater, walls sloughing from 2 m.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-372

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-373
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 1 Nov 14

Location: Sand and Gravel Borrow Area
Total Depth: 2.4 m
Date Completed: 1 Nov 14

Coordinates: 683,654 E , 5,609,180 N UTM NAD83 ZONE10
Elevation: 890.1 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	890.0					**TOPSOIL & ORGANICS** (0 to 0.1) ORGANICS, root inclusions; and TOPSOIL; SILT; some sand; trace gravel, fine to coarse grained, subangular to rounded, poorly graded, dark brown, non plastic, loose, moist.	0 m - A: 0 - 0.1 m
						SANDY GRAVEL (0.1 to 2.4) Sandy GRAVEL; some silt; trace cobbles, fine to coarse grained, angular to rounded, well graded, brownish grey, loose to compact, dry, massive. [Glaciofluvial]	
1.0	889.0						
2.0	888.0				▼		2 m - Groundwater Seepage at 2.0 m
						End of Test Pit: 2.4 m Wall instability / groundwater	
3.0	887.0						
4.0	886.0						
5.0	885.0						

GENERAL REMARKS:
Located on historic waste rock facility, easy to excavate, groundwater at 2 m, walls sloughing.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-373

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-374
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 1 Nov 14

Location: Sand and Gravel Borrow Area
Total Depth: 3.8 m
Date Completed: 1 Nov 14

Coordinates: 683,816 E , 5,609,281 N UTM NAD83 ZONE10
Elevation: 894.2 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	894.0					**TOPSOIL & ORGANICS** (0 to 0.1) ORGANICS, root inclusions; and TOPSOIL; silty; SAND; trace gravel, fine to coarse grained, angular to subrounded, poorly graded, medium greyish brown, loose, dry.	0 m - A: 0 - 0.1 m
						WASTE ROCK (0.1 to 3.8) Gravel and cobbles; some sand, angular; light grey, strong, fresh to slightly weathered, minimal oxidization or staining. [Mine Rock]	
1.0	893.0						
2.0	892.0						
3.0	891.0						
3.8						End of Test Pit: 3.8 m Wall instability	
4.0	890.0						
5.0	889.0						

GENERAL REMARKS:
Located on historic waste rock facility, difficult to excavate, no groundwater, walls sloughing from 2 m.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-374

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

PAGE B-894

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-375
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 1 Nov 14

Location: Sand and Gravel Borrow Area
Total Depth: 4.5 m
Date Completed: 1 Nov 14

Coordinates: 683,711 E , 5,609,341 N UTM NAD83 ZONE10
Elevation: 904.1 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	904.0					**TOPSOIL & ORGANICS** (0 to 0.1) ORGANICS, root inclusions; and TOPSOIL; Sandy; SILT; trace gravel, fine to coarse grained, angular to rounded, poorly graded, medium brown, non plastic, loose, dry.	0 m - A: 0 - 0.1 m
						GRAVELLY SAND (0.1 to 1.5) Gravelly SAND; some silt; trace cobbles; fine to coarse grained; angular to rounded, well graded, light grey, non plastic, dense, dry, massive.	
1.0	903.0						
						WASTE ROCK (1.5 to 4) Gravel and cobbles; some sand, angular; light grey, strong, fresh to slightly weathered, minimal oxidization or staining. [Mine Rock]	
2.0	902.0						
3.0	901.0						
4.0	900.0					**SANDY SILT** (4 to 4.5) Sandy SILT; some gravel; some cobbles; fine to coarse grained, angular to subrounded, well graded, dark grey/brown, low plasticity, dense, moist, massive.	
						End of Test Pit: 4.5 m Limit of excavator	
5.0	899.0						

GENERAL REMARKS:
Located near haul road and waste rock facility, difficult to excavate, no groundwater, walls stable.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-375

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-376
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 1 Nov 14

Location: Haul Road
Total Depth: 4.4 m
Date Completed: 1 Nov 14

Coordinates: 682,644 E , 5,610,161 N UTM NAD83 ZONE10
Elevation: 902.6 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	902.0					**TOPSOIL & ORGANICS** (0 to 0.05) ORGANICS, root inclusions; and TOPSOIL; SILT; some sand; trace gravel, fine to coarse grained, subangular to rounded, poorly graded, medium brown, loose, dry.	0 m - A: 0 - 0.05 m
						GRAVELLY SAND (0.05 to 1) Gravelly SAND; some silt; some cobbles; fine to coarse grained, angular to subrounded, well graded, light grey, non plastic, dense, dry.	
1.0	901.0					**GRAVELLY SILT** (1 to 4.4) Gravelly SILT; some sand; trace boulders; trace cobbles, fine to coarse grained, angular to rounded, well graded, medium orangey brown, dense, moist, low plasticity, massive. [Glacial Till]	
2.0	900.0						
3.0	899.0						
4.0	898.0					End of Test Pit: 4.4 m Limit of excavator	
5.0	897.0						

GENERAL REMARKS:
Bedrock outcrops nearby, difficult to excavate, no groundwater, walls stable.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-376

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-377
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 1 Nov 14

Location: Haul Road
Total Depth: 4.1 m
Date Completed: 1 Nov 14

Coordinates: 682,604 E , 5,610,406 N UTM NAD83 ZONE10
Elevation: 903.1 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	903.0					**TOPSOIL & ORGANICS** (0 to 0.4) ORGANICS, root inclusions; and TOPSOIL; SILT; some sand; trace gravel, fine to coarse grained, subangular to rounded, poorly graded, dark to medium brown, non plastic, loose to compact, dry, massive.	0 m - A: 0 - 0.2 m 0.2 m - B: 0.2 - 0.4 m
						GRAVELLY SAND (0.4 to 1.5) gravelly SAND; some silt; trace cobbles, fine to coarse grained, angular to subrounded, poorly graded, light greyish brown, non plastic, dense, dry, massive.	
1.0	902.0	G B	GP14-018				
						GRAVELLY SILT (1.5 to 4.1) gravelly SILT; some sand; trace cobbles; fine to coarse grained, angular to subrounded, poorly graded, dark greyish brown, very dense, moist, massive. [Glacial Till]	
2.0	901.0						
3.0	900.0						
4.0	899.0					End of Test Pit: 4.1 m Limit of excavator	
5.0	898.0						

GENERAL REMARKS:
Difficult to excavate, no groundwater, walls stable.

SAMPLING SYMBOLS:
G B GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-377

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-378
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 1 Nov 14

Location: Haul Road
Total Depth: 1.6 m
Date Completed: 1 Nov 14

Coordinates: 682,920 E , 5,610,558 N UTM NAD83 ZONE10
Elevation: 904.8 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	904.8					**TOPSOIL & ORGANICS** (0 to 0.8) ORGANICS, root inclusions; and TOPSOIL; SILT; trace gravel; trace sand; fine to coarse grained, subrounded to rounded, poorly graded, dark brown, non plastic, compact, dry, massive.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.8 m
1.0	904.0					**SILT** (0.8 to 1.6) SILT; trace gravel; trace sand; fine to coarse grained, subrounded to rounded, poorly graded, dark brown, medium plasticity, compact, moist, massive. [Loess]	
2.0	903.0					**WEATHERED BEDROCK** (1.6 to 1.6) Dark grey, strong, minimal weathering or staining. End of Test Pit: 1.6 m Refusal on bedrock	
3.0	902.0						
4.0	901.0						
5.0	900.0						
	899.0						

GENERAL REMARKS:
Bedrock outcrops nearby, very easy to excavate, no groundwater, walls stable.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-378

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-379
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 3 Nov 14

Location: Haul Road
Total Depth: 3.8 m
Date Completed: 3 Nov 14

Coordinates: 683,398 E , 5,610,539 N UTM NAD83 ZONE10
Elevation: 954.4 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	954.0					**TOPSOIL & ORGANICS** (0 to 0.4) ORGANICS, root inclusions; and TOPSOIL; SILT; some sand; trace gravel, fine to coarse grained, subangular to rounded, poorly graded, dark to medium brown, non plastic, loose to dense, dry, massive.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.4 m
						GRAVELLY SANDY SILT (0.4 to 3.8) Gravelly Sandy SILT; trace cobbles; trace clay; fine to coarse grained, angular to rounded, poorly graded, dark greyish brown, very dense, low plasticity. [Glacial Till]	
1.0	953.0	G B	GP14-019				
2.0	952.0						
3.0	951.0						
4.0	950.0					End of Test Pit: 3.8 m Refusal on bedrock	
5.0	949.0						

GENERAL REMARKS:
Bedrock outcrops nearby, difficult to excavate, no groundwater, walls stable.

SAMPLING SYMBOLS:
G B GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-379

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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Project: AJAX PROJECT
Test Pit No.: TP14-380
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 3 Nov 14

Location: North Embankment
Total Depth: 1.5 m
Date Completed: 3 Nov 14

Coordinates: 684,741 E , 5,607,557 N UTM NAD83 ZONE10
Elevation: 1014.5 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1014.5					**TOPSOIL & ORGANICS** (0 to 0.2) ORGANICS, root inclusions; and TOPSOIL; SILT; some sand; trace gravel, fine to coarse grained, subangular to rounded, gap graded, dark brown, loose, moist.	0 m - A: 0 - 0.2 m
	1014.0					**GRAVELLY SANDY SILT** (0.2 to 1.5) Gravelly Sandy SILT; trace cobbles, fine to coarse grained, angular to subrounded, gap graded, dark greyish brown, low to medium plasticity, dense, moist, massive. [Glacial Till]	
1.0							
	1013.0					End of Test Pit: 1.5 m Refusal on dense material	
2.0							
	1012.0						
3.0							
	1011.0						
4.0							
	1010.0						
5.0							
	1009.0						

GENERAL REMARKS:
Sump for drill site DH14-019

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-380

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-381
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 3 Nov 14

Location: North Embankment
Total Depth: 0.4 m
Date Completed: 3 Nov 14

Coordinates: 684,704 E , 5,607,743 N UTM NAD83 ZONE10
Elevation: 1005.2 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	1005.0					**TOPSOIL & ORGANICS** (0 to 0.3) ORGANICS, root inclusions; and TOPSOIL; SILT; trace sand; trace gravel, fine grained, subangular to rounded, poorly graded, dark brown, non plastic, loose, moist, massive.	0 m - A: 0 - 0.3 m
						WEATHERED BEDROCK (0.3 to 0.4) Dark grey, with significant iron oxide staining on all surfaces, strong, slightly weathered, fractured.	
1.0	1004.0					End of Test Pit: 0.4 m Refusal on bedrock	
2.0	1003.0						
3.0	1002.0						
4.0	1001.0						
5.0	1000.0						

GENERAL REMARKS:
Sump for drill site DH14-018

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-381

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Contractor: Cobra Contracting Ltd.
Location: Sand and Gravel Borrow Area
Coordinates: 686,743 E , 5,608,893 N UTM NAD83 ZONE10

Test Pit No.: TP14-382
Equipment Used: CAT 320D L
Total Depth: 2.1 m
Elevation: 889.4 m

Page: 1 of 1
Date Started: 4 Nov 14
Date Completed: 4 Nov 14
Logged by: MAP
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	889.0					**TOPSOIL & ORGANICS** (0 to 0.3) ORGANICS, root inclusions; and TOPSOIL; SILT; some sand; trace cobbles; trace gravel, fine to coarse grained, subangular to rounded, poorly graded, dark to medium brown, non plastic, loose to compact, dry, massive.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.3 m 0.3 m - C: 0.3 - 0.5 m
						SANDY SILT (0.3 to 0.5) Sandy SILT: some gravel; trace cobbles; fine to coarse grained, angular to subrounded, non plastic, light greyish brown, dense, dry, massive.	
1.0	888.0					**GRAVELLY SAND** (0.5 to 2.1) Gravelly; SAND; some silt; some cobbles; trace boulders, fine to coarse grained, angular to subrounded, gap graded, light greyish brown, non plastic, dense, massive. [Colluvium]	
2.0	887.0					End of Test Pit: 2.1 m Refusal on bedrock	
3.0	886.0						
4.0	885.0						
5.0	884.0						

GENERAL REMARKS:
Bedrock outcrops nearby, difficult to excavate, no groundwater, walls stable.

SAMPLING SYMBOLS:
GB GRAB ■ BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-382

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-383
Page: 1 of 1

Contractor: Cobra Contracting Ltd.
Equipment Used: CAT 320D L
Date Started: 4 Nov 14

Location: Sand and Gravel Borrow Area
Total Depth: 4.8 m
Date Completed: 4 Nov 14

Coordinates: 686,937 E , 5,608,814 N UTM NAD83 ZONE10
Elevation: 889.1 m
Logged by: MAP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
0	889.0					**TOPSOIL & ORGANICS** (0 to 0.2) ORGANICS, root inclusions; and TOPSOIL; SILT; some sand, fine grained, poorly graded, dark to medium greyish brown, loose, dry, massive.	0 m - A: 0 - 0.1 m 0.1 m - B: 0.1 - 0.2 m
						SILT (0.2 to 2) SILT; some to trace sand; trace gravel; fine grained, poorly graded, light greyish brown, compact, dry. [Loess]	
1.0	888.0						
2.0	887.0					**SILTY SAND** (2 to 4.8) Silty; SAND; trace gravel; trace cobbles; fine to medium grained, dark greyish brown, non plastic, loose, saturated. [Loess]	
3.0	886.0						
4.0	885.0						
4.8	884.3					End of Test Pit: 4.8 m Limit of excavator	
5.0	884.0						

GENERAL REMARKS:
Very very easy to excavate, ground is saturated from 2 m, walls sloughing very badly.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-383

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: AJAX PROJECT
Test Pit No.: TP14-384
Page: 1 of 1

Contractor: Bedrock Outcrop
Equipment Used: CAT 320D L
Date Started: 4 Nov 14

Location: Plant Site
Total Depth: 2 m
Date Completed: 4 Nov 14

Coordinates: 686,589 E , 5,608,251 N UTM NAD83 ZONE10
Elevation: 971 m
Logged by: JAS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	SAMPLES	SAMPLE NO.	GRAPHIC LOG	WATER LEVEL	MATERIAL DESCRIPTION	COMMENTS
1.0	970.0					**WEATHERED BEDROCK** (0 to 2) Moderately weathered, light grey, iron oxide staining, very fractured, strong.	0 m - None
2.0	969.0					End of Test Pit: 2 m Refusal on bedrock	
3.0	968.0						
4.0	967.0						
5.0	966.0						

GENERAL REMARKS:
Bedrock outcrop.

SAMPLING SYMBOLS:
GB GRAB BLOCK

KGHM AJAX MINING INC.
AJAX PROJECT

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
101-00246/26	11	0

FIGURE B1-384

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX TEST PITS REPORT 11.GPJ
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Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: East Embankment

Coordinates: 684,918 E , 5,607,609 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 32.00 m, HQ3: 32 - 79.33 m

Drillhole No.: DH14-001

Drill Type: Fraste DR239

Total Depth: 79.33 m

Elevation: 973.8 m

Azimuth , Inclination: 0 , -90

Page: 1 of 4

Date Started: 18 Jul 14

Date Completed: 21 Jul 14

Logged by: LEP/LS/MAS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
			SILTY SAND (0 to 6) Angular to subangular, fine to coarse grained, some fine grained subangular to subrounded gravel, trace clay; poorly graded, low plasticity, brown to brownish grey, compact to dense, massive, moist to dry.		SPT #1	84		12/18/15	33			
					SPT #2	100		5/3/5	8			
	970.0											
5					SPT #3	100		14/17/20	37			
			SILTY, GRAVELLY SAND (6 to 12) Fine to coarse grained sand, angular to subrounded gravel, trace cobbles and boulders, well graded, low plasticity, brownish grey, very dense, moist to dry.		SPT #4	0		50+	R			Refusal on boulder, Start using water while advancing
					SPT #5	79		14/22/30	52			
	965.0											
10					SPT #6	100		10/21/25	46			Stop using water to 10.66m
					SPT #7	100		10/18/24	42			
			GRAVELLY SAND (12 to 15) Fine grained to coarse grained, angular to subangular, some silt, well graded, low to medium plasticity, brown to greyish brown, massive, dense, wet.		SPT #8	84		6/13/21	34			
	960.0				SPT #9	92		22/23/21	44			
15			**SANDY SILT** (15 to 21) Some fine grained angular to subangular gravel, trace clay, gap graded, low to medium plasticity, brown to greyish brown, stiff, massive, moist.		SPT #10	100		7/14/26	40			Driller injecting more water for this run
					SPT #11	93		7/12/14	26			
	955.0				SPT #12	100		38/50/50+	R			Refusal on boulder or very dense material
20					SPT #13	67		19/41/50+	R			Refusal on very dense material
			GRAVELLY, SILTY SAND (21 to 27) Fine to coarse grained, angular to subrounded, trace to some clay, gap to well graded, low to no plasticity, brown to brownish grey, very dense, massive, moist.		SPT #14	74		8/17/31	48			
					SPT #15	31		17/36/49	R			Refusal on very dense material
	950.0				SPT #16	100		20/25/30	55			

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-1

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project
Contractor: Geotech Drilling Services Ltd.
Location: East Embankment
Coordinates: 684,918 E , 5,607,609 N
Coordinate System: UTM NAD83 Zone 10
Hole Size ODEX: 0 - 32.00 m, HQ3: 32 - 79.33 m

Drillhole No.: DH14-001
Drill Type: Fraste DR239
Total Depth: 79.33 m
Elevation: 973.8 m
Azimuth , Inclination: 0 , -90

Page: 2 of 4
Date Started: 18 Jul 14
Date Completed: 21 Jul 14
Logged by: LEP/LS/MAS
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
					SPT #17	100		14/23/50	73			
			SANDY SILT (27 to 32) Fine grained, trace gravel, some clay, clasts up to 1.5cm, subangular, gap graded, low to medium plasticity, brownish grey, very dense, massive, moist.		SPT #18	100		9/17/29	46			
	945.0				SPT #19	100		7/15/26	41			
30					SPT #20	100		9/14/16	30			
			PICRITE (32 to 42.23) Medium greenish grey, fine grained, fresh, highly fractured, moderate pervasive chlorite and sericite alteration, minor quartz calcite veins and stringers, trace disseminated pyrite.		SPT #21	100		26/50+	R			Refusal on bedrock
	940.0			41	SPT #22	0		50+	R			Refusal on bedrock
35				80				R2				
				100				R2				
			(37.33) Gougey, broken zone within unit, faults at 36.15 - 38.83 m, 41.3 - 41.68 m, and 41.68 - 41.80 m	100				R0				
	935.0			97				R2				
40				98				R2				
				100				R0				
			QUARTZ FELDSPAR PORPHYRY (42.23 to 45.95) Medium greenish grey, fine grained, fresh, highly fractured, moderate pervasive chlorite and sericite alteration, minor quartz calcite veins and stringers, trace disseminated pyrite.	96				R3				
	930.0			100				R3				
45				100	UCS#1			R3				44.6 - 55.3 m - packer test incomplete - test abandoned
			PICRITE (45.95 to 58.34) Medium greenish grey, fine grained, fresh, highly fractured, moderate pervasive chlorite and sericite alteration, minor quartz calcite veins and stringers, trace disseminated pyrite.	100				R2				
	925.0			98				R3				

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-1

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project
Contractor: Geotech Drilling Services Ltd.
Location: East Embankment
Coordinates: 684,918 E , 5,607,609 N
Coordinate System: UTM NAD83 Zone 10
Hole Size ODEX: 0 - 32.00 m, HQ3: 32 - 79.33 m

Drillhole No.: DH14-001
Drill Type: Fraste DR239
Total Depth: 79.33 m
Elevation: 973.8 m
Azimuth , Inclination: 0 , -90

Page: 3 of 4
Date Started: 18 Jul 14
Date Completed: 21 Jul 14
Logged by: LEP/LS/MAS
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - × (20 40 60 80)	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
			PICRITE (45.95 to 58.34) Medium greenish grey, fine grained, fresh, highly fractured, moderate pervasive chlorite and sericite alteration, minor quartz calcite veins and stringers, trace disseminated pyrite.	100				R3				
				100				R2				
				100	UCS#2			R4				
	920.0		(53.34 to 58.34) Gougey, broken zone within unit.	98				R3				53.6 - 67.3 m - lugeon packer test #2 = 1 x 10-8 m/s
55				92				R2				
				100				R2				
	915.0		**QUARTZ FELDSPAR PORPHYRY** (58.34 to 59.6) Medium greenish grey, fine grained, fresh, highly fractured, moderate pervasive chlorite and sericite alteration, minor quartz calcite veins and stringers, trace disseminated pyrite.	96				R4				
60				100				R0				
			PICRITE (59.6 to 64.18) Medium green and dark grey, fine grained, thinly foliated, fresh, some brecciation at start and end of unit, moderate pervasive epidote and chlorite alteration, trace calcite stringers.	100				R2				
	910.0			100				R2				
			QUARTZ FELDSPAR PORPHYRY (64.18 to 71.8) Medium greenish grey, fine grained, fresh, highly fractured, moderate pervasive chlorite and sericite alteration, minor quartz calcite veins and stringers, trace disseminated pyrite.	99				R4				
65				100				R4				65.6 - 79.3 m - lugeon packer test #3 = 3 x 10-8 m/s
				100				R4				
	905.0			100				R4				
70				95				R4				
			MAFIC VOLCANICS (71.8 to 79.33) Medium greenish grey, fine grained, fresh, highly fractured, moderate pervasive chlorite and sericite alteration, minor quartz calcite veins and stringers, trace disseminated pyrite.	100				R2				
	900.0			100				R4				

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-1

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project
Contractor: Geotech Drilling Services Ltd.
Location: East Embankment
Coordinates: 684,918 E , 5,607,609 N
Coordinate System: UTM NAD83 Zone 10
Hole Size ODEX: 0 - 32.00 m, HQ3: 32 - 79.33 m

Drillhole No.: DH14-001
Drill Type: Fraste DR239
Total Depth: 79.33 m
Elevation: 973.8 m
Azimuth , Inclination: 0 , -90

Page: 4 of 4
Date Started: 18 Jul 14
Date Completed: 21 Jul 14
Logged by: LEP/LS/MAS
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - × (20 40 60 80)	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
	895.0		**MAFIC VOLCANICS** (71.8 to 79.33) Medium greenish grey, fine grained, fresh, highly fractured, moderate pervasive chlorite and sericite alteration, minor quartz calcite veins and stringers, trace disseminated pyrite.	95				R4				
				94				R3				
				100				R3				
80	890.0		End of Drillhole: 79.33 m Reached Target Depth									
85	885.0											
90	880.0											
95	875.0											

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-1

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: East Embankment

Coordinates: 684,478 E , 5,607,522 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 22.86 m, HQ3: 22.86 - 52.00 m

Drillhole No.: DH14-002

Drill Type: Fraste DR239

Total Depth: 52.00 m

Elevation: 1054.6 m

Azimuth , Inclination: 0 , -90

Page: 1 of 3

Date Started: 21 Jul 14

Date Completed: 23 Jul 14

Logged by: LEP/LS/MAS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
			SILTY SAND (0 to 3.05) Fine grained; some gravel, fine to medium grained, subangular to subrounded; trace boulders; well graded, low plasticity, massive, brown, compact to dense, dry, some orangey silt coating on gravel fragments.		SPT #1	52		12/20/15	35			
			SANDY SILT (3.05 to 12.19) Fine grained; some gravel, fine to medium grained, subangular to angular; trace cobbles; moderately graded, medium to low plasticity, brown with grey and orange clasts, compact, stratified layers with higher gravel and higher silt content, moist to wet.		SPT #2	100		13/11/14	25			
5	1050.0				SPT #3	100		6/11/16	27			
					SPT #4	100		8/10/14	24			
					SPT #5	100		8/11/12	23			
10	1045.0				SPT #6	100		7/7/12	19			
					SPT #7	100		12/21/22	43			
			SILT AND GRAVEL (12.19 to 16.76) Fine to medium grained, subangular; some sand, fine to coarse grained; well graded, medium plasticity, greyish brown with grey and red clasts (up to 2 cm diameter), stratified, compact, very moist to wet.		SPT #8	100		6/12/10	22			
					SPT #9	95		7/8/8	16			
15	1040.0				SPT #10	84		21/30/7	37			
			SAND AND SILT (16.76 to 22.86) Fine to medium grained; some gravel, fine to medium grained, subangular to subrounded; trace clay; poorly graded to gap graded, high to medium plasticity, greyish brown, massive, compact to dense.		SPT #11	100		2/7/6	13			Start injecting water for drilling
					SPT #12	100		13/12/7	19			
20	1035.0				SPT #13	100		12/18/5	23			
					SPT #14	100		21/50+	R			Refusal on bedrock
			BROKEN ZONE (22.86 to 24.96) Greenish grey; fine to medium grained, porphyritic; broken zone; medium strong, calcite infill, some coarse grained sand and fine grained gravel.	30 83	SPT #15	100		50+ R3	R			Refusal on bedrock
	1030.0											

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-2

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: East Embankment

Coordinates: 684,478 E , 5,607,522 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 22.86 m, HQ3: 22.86 - 52.00 m

Drillhole No.: DH14-002

Drill Type: Fraste DR239

Total Depth: 52.00 m

Elevation: 1054.6 m

Azimuth , Inclination: 0 , -90

Page: 2 of 3

Date Started: 21 Jul 14

Date Completed: 23 Jul 14

Logged by: LEP/LS/MAS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - × (20 40 60 80)	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
			FELDSPAR PORPHYRY INTERMEDIATE (24.96 to 28.46) Greenish grey; fine to coarse grained, porphyritic, massive; moderately fractured; moderately weathered; medium strong, calcite infill, some rubble infill, calcite veins, some FeO staining, clay infill on one joint, quartz and calcite content increasing with depth.	93				R3				
				100				R3				
				100				R3				27.74 - 33.96 m - Lugeon Packer Test #1 - K = < 1E-08 m/s (flows below capability of flowmeter to measure)
30	1025.0		**FELDSPAR PORPHYRY INTERMEDIATE** (28.46 to 33.96) Grey; fine grained, porphyritic, massive; fresh to slightly weathered; medium strong, calcite infill, FeO staining, thin calcite veins.	99				R3				
				100				R3				
				100	UCS#1			R3				
35	1020.0		**FELDSPAR PORPHYRY INTERMEDIATE** (33.96 to 41.46) Greenish grey with purplish red alteration; fine to coarse grained, porphyritic, massive; some healed joints and veins, joints are smooth slightly rough (some healed); moderately weathered; medium strong, FeO staining, calcite veins , calcite infill.	100				R3				
				100				R3				35.24 - 39.96 m - Lugeon Packer Test #2 - no take
				100				R3				
				100				R3				
40	1015.0			61				R3				
			FELDSPAR PORPHYRY INTERMEDIATE (41.46 to 51.96) Greenish grey with dark grey phenocrysts; fine to medium grained, porphyritic, massive; some healed fractures and veinlets; fresh to moderately weathered; medium strong, calcite and FeO infill, calcite veins and veinlets throughout.	100				R3				41.24 - 45.96 m - Lugeon Packer Test #3 - no take
				100				R3				
45	1010.0			100				R3				
				100	UCS#2			R3				45.74 - 51.96 m - Lugeon Packer Test #4 - K = < 1E-08 m/s (flows below capability of flowmeter to measure)
				100				R3				
	1005.0			95				R3				

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-2

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: East Embankment

Coordinates: 684,478 E , 5,607,522 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 22.86 m, HQ3: 22.86 - 52.00 m

Drillhole No.: DH14-002

Drill Type: Fraste DR239

Total Depth: 52.00 m

Elevation: 1054.6 m

Azimuth , Inclination: 0 , -90

Page: 3 of 3

Date Started: 21 Jul 14

Date Completed: 23 Jul 14

Logged by: LEP/LS/MAS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - × (20 40 60 80)	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
				100				R3				
			End of Drillhole: 52 m Reached Target Depth									
55	1000.0											
60	995.0											
65	990.0											
70	985.0											
	980.0											

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-2

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: East Embankment

Coordinates: 684,124 E , 5,607,684 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 2.91 m, HQ3: 2.91 - 35.50 m

Drillhole No.: DH14-003

Drill Type: Fraste DR239

Total Depth: 35.50 m

Elevation: 1062.7 m

Azimuth , Inclination: 0 , -90

Page: 1 of 2

Date Started: 24 Jul 14

Date Completed: 25 Jul 14

Logged by: LEP/MAS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
			SILTY SAND (0 to 0.91) Fine to coarse grained, angular to subrounded, medium plasticity, brown, compact, massive, moist.									
					SPT #1	0		50+	R			SPT refusal on bedrock
	1060.0		**WEATHERED BEDROCK** (0.91 to 3.05) Weathered bedrock with sand, fine to coarse grained, poorly graded, angular, light orange/brown, non plastic, very dense, massive, dry.		SPT #2	20		50+	R			
				79				R3				
5			**VOLCANICLASTIC** (3.05 to 10.23) Orange to grey, fine to coarse grained, porphyritic, massive, moderately to highly weathered, moderately to heavily fractured, calcite and quartz veins throughout, many well healed fractures. FeO staining throughout rock and along joints over interval. Minor dissolution weathering (vugs) in quartz and calcite veins.	92	UCS#2			R3				
				99				R3				6.0 - 11.5 m - lugeon packer test #1 = 4 x 10-6 m/s
	1055.0			100				R3				
				100				R3				
10			**VOLCANICLASTIC** (10.23 to 23.53) Light grey, fine to medium grained, porphyritic, brecciated, moderately fractured, slightly weathered, strong. Calcite veins and veinlets throughout. Some dissolution weathering, FeO staining along joints.	99				R3				
				100				R3				11.3 - 17.5 m - lugeon packer test #2 = 2 x 10-8 m/s
	1050.0			100				R3				
				100				R3				
15				100	UCS#3			R3				
	1045.0			100				R4				17.3 - 23.5 m - lugeon packer test #3 = 3 x 10-8 m/s
			FAULT ZONE (18.62) (18.62 - 19.0 m) - Fractured and broken rubble zone within unit.	97				R3				
20				97				R4				
				97				R4				
	1040.0			100				R4				
				97				R4				23.3 - 29.5 m - lugeon packer test #4 = 1 x 10-7 m/s

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-3

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: East Embankment

Coordinates: 684,124 E , 5,607,684 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 2.91 m, HQ3: 2.91 - 35.50 m

Drillhole No.: DH14-003

Drill Type: Fraste DR239

Total Depth: 35.50 m

Elevation: 1062.7 m

Azimuth , Inclination: 0 , -90

Page: 2 of 2

Date Started: 24 Jul 14

Date Completed: 25 Jul 14

Logged by: LEP/MAS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - × (20 40 60 80)	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
			VOLCANICLASTIC (23.53 to 33.53) Light grey, fine to medium grained, porphyritic, brecciated, unweathered to slightly weathered, strong. Calcite veins and veinlets throughout. Some dissolution weathering, FeO staining along joints increasing towards end of interval.	100				R4				
				100				R4				
	1035.0			100	UCS#1			R4				
30				100				R4				29.3 - 35.5 m - lugeon packer test #5 = 1 x 10-7 m/s
				100				R4				
	1030.0			98				R4				
			VOLCANICLASTIC (33.53 to 35.53) Greenish grey to purplish grey, fine to medium grained, porphyritic, brecciated, moderately fractured, slightly weathered, medium strong. Calcite veins and veinlets throughout. FeO staining along joints.	100				R4				
35			End of Drillhole: 35.5 m Reached Target Depth									
	1025.0											
40												
	1020.0											
45												
	1015.0											

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-3

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Cicada Study - General Mine Site Infrastructure

Coordinates: 685,738 E , 5,609,107 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 8.81, HQ3: 8.81 - 109.42

Drillhole No.: DH14-004

Drill Type: Fraste DR238

Total Depth: 109.42 m

Elevation: 892.5 m

Azimuth , Inclination: 0 , -90

Page: 1 of 5

Date Started: 25 Jul 14

Date Completed: 28 Jul 14

Logged by: LS/JEF

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
			SILTY, GRAVELLY SAND (0 to 8) Fine to coarse grained sand; subrounded to subangular gravel clasts (<4 cm diameter); trace clay; well graded, low plasticity, brown, massive, moist.		SPT #1	100		12/22/20	42			
	890.0				SPT #2	100		12/16/32	48			
5					SPT #3	100		11/20/25	45			
					SPT #4	100		11/18/22	40			
	885.0				SPT #5	100		13/24/22	46			
			NO RECOVERY (8 to 8.8) Bedrock contact at 8.0 mbgs.		SPT #6	0		50+	R			SPT refusal on bedrock
10			**SUGARLOAF DIORITE** (8.8 to 13.8) Blue-grey, medium grained, xenolithic, moderately weathered, fractured, iron oxide staining on joint surfaces, 0.1% chalcopyrite.	94								
				100				R5				
	880.0				TRI#1							12.31 - 26.21 m - Lugeon Packer Test #1 - K = 2E-08 m/s
				100				R5				
15			**MAFIC VOLCANIC** (13.8 to 20.1) Blue-grey, fine grained, moderately weathered, fractured, iron oxide staining on joint surfaces, 2% irregular whispy calcite stringers 0.1% disseminated pyrite and 0.5% pyrite stringers.	100				R4				
				100				R5				
	875.0			100				R5				
				99				R5				
20			**SUGARLOAF DIORITE** (20.1 to 64.3) Blue to greenish-grey, medium grained, xenolithic, slightly weathered, some fracturing, calcite, epidote and chlorite, veining of magnetite and pyrite locally up to 80% over a few cms.	100				R5				
	870.0			90				R5				
				100				R5				

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-4

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Cicada Study - General Mine Site Infrastructure

Coordinates: 685,738 E , 5,609,107 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 8.81, HQ3: 8.81 - 109.42

Drillhole No.: DH14-004

Drill Type: Fraste DR238

Total Depth: 109.42 m

Elevation: 892.5 m

Azimuth , Inclination: 0 , -90

Date Started: 25 Jul 14

Date Completed: 28 Jul 14

Logged by: LS/JEF

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
30	865.0		**SUGARLOAF DIORITE** (20.1 to 64.3) Blue to greenish-grey, medium grained, xenolithic, slightly weathered, some fracturing, calcite, epidote and chlorite, veining of magnetite and pyrite locally up to 80% over a few cms.	100				R5				
				100				R5				26.03 - 41.39 m - Lugeon Packer Test #2 - K = 1E-08 m/s
				100	UCS#2			R5				
				99				R5				
				100				R5				
35	860.0			95				R5				
				100				R5				
				97				R5				
	855.0			99				R5				
				98				R5				
40				99				R5				
	850.0			99				R5				41.26 - 56.69 m - Lugeon Packer Test #3 - K = 4E-07 m/s
				99				R5				
45				95				R5				
	845.0			100	UCS#1			R5				
				100				R5				
				100				R5				

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-4

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project
Contractor: Geotech Drilling Services Ltd.
Location: Cicada Study - General Mine Site Infrastructure
Coordinates: 685,738 E , 5,609,107 N
Coordinate System: UTM NAD83 Zone 10
Hole Size ODEX: 0 - 8.81, HQ3: 8.81 - 109.42

Drillhole No.: DH14-004
Drill Type: Fraste DR238
Total Depth: 109.42 m
Elevation: 892.5 m
Azimuth , Inclination: 0 , -90

Page: 3 of 5
Date Started: 25 Jul 14
Date Completed: 28 Jul 14
Logged by: LS/JEF
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
			SUGARLOAF DIORITE (20.1 to 64.3) Blue to greenish-grey, medium grained, xenolithic, slightly weathered, some fracturing, calcite, epidote and chlorite, veining of magnetite and pyrite locally up to 80% over a few cms.									
	840.0			99				R5				
				100				R5				
55				99				R5				
				100				R5				
	835.0			100				R5				56.50 - 91.70 m - Falling Head Packer Test #1 - K = 7E-08 m/s
				100				R5				
60				100				R5				
				100				R5				
	830.0			100				R5				
			PICRITE (64.3 to 66.8) Blue-grey, Fine grained, aphanitic, slight to moderate weathering, whispy calcite veinlets and infill, trace magnetite veins and blebby pyrite locally, minor irregular serpentinite stringers, rare gypsum vein.	100				R5				
65				100				R5				
	825.0		**FAULT ZONE** (66.8 to 72.4) Fractured and broken rubble zone within picrite unit.	100				R5				
				74				R5				
70				59				R4				
	820.0			81				R4				
				94				R5				

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-4

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project
Contractor: Geotech Drilling Services Ltd.
Location: Cicada Study - General Mine Site Infrastructure
Coordinates: 685,738 E , 5,609,107 N
Coordinate System: UTM NAD83 Zone 10
Hole Size ODEX: 0 - 8.81, HQ3: 8.81 - 109.42

Drillhole No.: DH14-004
Drill Type: Fraste DR238
Total Depth: 109.42 m
Elevation: 892.5 m
Azimuth , Inclination: 0 , -90

Page: 4 of 5
Date Started: 25 Jul 14
Date Completed: 28 Jul 14
Logged by: LS/JEF
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
			PICRITE (72.4 to 81.2) Blue-grey, Fine grained, aphanitic, slight to moderate weathering, whispy calcite veinlets and infill, trace magnetite veins and blebby pyrite locally, minor irregular serpentinite stringers, rare gypsum vein.	97				R5				
				100				R5				
	815.0				UCS#3							
				100				R5				
80				93				R5				
			FAULT ZONE (81.2 to 82.6) Faulted contact with picrite unit.	93				R5				
	810.0		**PICRITE** (82.6 to 84.9) Dark greenish grey, fine to coarse grained, brecciated, matrix supported, moderately weathered, calcite veins and calcite and chlorite on joints, minor irregular serpentinite stringers, dissolution locally.	100				R4				
85				100				R5				
			PICRITE (84.9 to 88.3) Dark to light grey with some greenish zones, fine to medium grained, aphanitic to porphyritic, slightly to highly weathered, calcite, clay and chlorite on joints, local dissolution.	97				R4				
	805.0			100				R4				
			FAULT ZONE (88.3 to 96.8) Faulted contact with mafic tuff.	99				R2				
90				76				R2				
				100				R2				
	800.0			99				R2				
95				99				R4				
				100				R4				
	795.0		**PICRITE** (96.8 to 100.8) Dark to light grey, fine to coarse grained, brecciated, slight to moderate weathering, some irregular calcite stringers, minor irregular serpentinite stringers.	100				R5				
				97	UCS#4			R5				

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-4

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Cicada Study - General Mine Site Infrastructure

Coordinates: 685,738 E , 5,609,107 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 8.81, HQ3: 8.81 - 109.42

Drillhole No.: DH14-004

Drill Type: Fraste DR238

Total Depth: 109.42 m

Elevation: 892.5 m

Azimuth , Inclination: 0 , -90

Date Started: 25 Jul 14

Date Completed: 28 Jul 14

Logged by: LS/JEF

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - × (20 40 60 80)	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
105	790.0		**PICRITE** (100.8 to 109.4) Dark to light grey with some greenish zones, fine to medium grained, aphanitic to porphyritic, moderately weathered, calcite and chlorite on joints, minor irregular serpentinite stringers.	99				R5				
				100				R5				
				100				R4				
				99				R4				
	785.0			100				R4				
110				100				R4				
			End of Drillhole: 109.42 m Reached Target Depth									
	780.0											
115												
	775.0											
120												
	770.0											

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-4

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project
Contractor: Geotech Drilling Services Ltd.
Location: East Embankment
Coordinates: 684,730 E , 5,607,381 N
Coordinate System: UTM NAD83 Zone 10
Hole Size ODEX: 0 - 13.71 m, HQ3: 13.71 - 45.70 m

Drillhole No.: DH14-005
Drill Type: Fraste DR239
Total Depth: 45.70 m
Elevation: 994.2 m
Azimuth , Inclination: 0 , -90

Page: 1 of 2
Date Started: 25 Jul 14
Date Completed: 27 Jul 14
Logged by: LEP/MAS
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE
0	994.2	**SILTY SAND** (0 to 1.52) Angular to subangular, fine to coarse grained, poorly graded, medium to low plasticity, brown to light brown, compact, massive, moist to dry.		SPT #1	79		5/5/12	17
		SAND (1.52 to 4.57) Angular to subangular, fine to medium grained, some silt, some gravel, subangular, fine to medium grained, poorly graded, low plasticity, brown with minor orange oxidation, compact to dense, massive, moist		SPT #2	67		13/14/25	39
	990.0			SPT #3	90		9/7/8	15
5		**SILTY SAND** (4.57 to 6.09) Angular to subangular, fine grained to medium grained, non-plastic to low plasticity, brown to light brown with minor orange oxidation, compact, bedded silt and sand layers, moist		SPT #4	95		4/8/15	23
		GRAVELLY, SILTY SAND (6.09 to 10.7) Fine to coarse grained, angular to subrounded, trace to some clay, gap to well graded, low to no plasticity, brown to brownish grey, very dense, massive, moist.		SPT #5	92		5/6/11	17
	985.0			SPT #6	100		3/4/9	13
10		**VOLCANICLASTIC** (10.7 to 14.2) Rubblized felsic volcanics, greenish grey, highly weathered, calcite and quartz veins throughout fragments, poor recovery.		SPT #7	100		5/6/36	42
				SPT #8	0		50+	R
	980.0		0				R3	
		VOLCANICLASTIC (14.2 to 18.7) Rubblized felsic volcanics, light greenish grey and white, highly fractured in some zones with calcite and chlorite infilling, heavily weathered.	0				R3	
15			0				R3	
			42				R3	
	975.0	**VOLCANICLASTIC** (18.7 to 24.7) Greenish grey felsic volcanics, fine grained, massive, stockwork calcite veins throughout, moderately fractured with moderately to heavy weathering, FeO staining along joints. Heavily fractured / rubbleized at start of interval.	12				R4	
20			82				R4	
			82				R4	
	970.0		61				R4	

RQD
SPT TEST 'N' VALUES - 20 40 60 80

INSTRUMENTATION / WELL DETAILS

DRILLING NOTES
Start injecting water for drilling
SPT refusal on bedrock
SPT refusal on bedrock
21.5 - 27.7 m - lugeon packer test #1 = <1 x 10-8 m/s

GENERAL REMARKS:
Artesian Well

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-5

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: East Embankment

Coordinates: 684,730 E , 5,607,381 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 13.71 m, HQ3: 13.71 - 45.70 m

Drillhole No.: DH14-005

Drill Type: Fraste DR239

Total Depth: 45.70 m

Elevation: 994.2 m

Azimuth , Inclination: 0 , -90

Page: 2 of 2

Date Started: 25 Jul 14

Date Completed: 27 Jul 14

Logged by: LEP/MAS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
			VOLCANICLASTIC (24.7 to 27.7) Grey to light grey volcanics, highly fractured and broken up in several zones, highly weathered along joints and in fractures - stained greenish / orange.	0				R4				
				37				R4				27.5 - 33.7 m - lugeon packer test #2 = 5 x 10-8 m/s
			VOLCANICLASTIC (27.7 to 30.5) White to light grey volcanics, fine grained, massive, moderately fractured with clay and calcite infill. Some FeO staining along joints.	0				R4				
	965.0			0				R4				
30			**VOLCANICLASTIC** (30.5 to 31.54) Light grey volcanics, fine grained, highly fractured and rubbleized, highly weathered with green/orange FeO staining along joints and in fractures becoming more weathered / altered.	29				R4				
				100	UCS#1			R4				
			VOLCANICLASTIC (31.54 to 45.7) Light grey volcanics, fine grained, massive, moderately fractured, calcite veins and veinlets throughout rock, silicification and quartz flooding of rock over ~43.0 to 44.5 m, rock is fresh and unweathered.	88				R4				33.5 - 39.7 m - lugeon packer test #3 = <1 x 10-8 m/s
	960.0			100	UCS#2			R4				
35				100				R4				
				100				R4				
	955.0			83				R4				39.5 - 45.7 m - lugeon packer test #4 = 4 x 10-8 m/s
40				100				R4				
				97				R4				
	950.0			100	UCS#3			R5				
45												
			End of Drillhole: 45.7 m Reached Target Depth									
	945.0											

GENERAL REMARKS:

Artesian Well

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-5

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project
Contractor: Geotech Drilling Services Ltd.
Location: East Embankment
Coordinates: 684,757 E , 5,607,168 N
Coordinate System: UTM NAD83 Zone 10
Hole Size ODEX: 0 - 18.28 m, HQ3: 18.28 - 48.70 m

Drillhole No.: DH14-006
Drill Type: Fraste DR239
Total Depth: 48.70 m
Elevation: 982.1 m
Azimuth , Inclination: 0 , -90

Page: 1 of 2
Date Started: 27 Jul 14
Date Completed: 28 Jul 14
Logged by: LEP/MAS
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
			SILTY SAND WITH GRAVEL (0 to 3.05) Fine to medium grained, angular to subangular, poorly graded, non plastic, brown, compact, dry to moist. Trace angular to subangular, fine grained gravel.		SPT #1	100		5/11/12	23			
	980.0		**SANDY GRAVEL** (3.05 to 10.67) Fine to coarse grained, angular to subangular clasts up to 1 cm, some FeO staining on clasts, non plastic, some silt, brown, slightly moist.		SPT #2	100		16/20/28	48			
5					SPT #3	100		18/50+	R			SPT refusal on coarse material
					SPT #4	100		18/32/40	72			
	975.0				SPT #5	100		50+	R			SPT refusal on coarse material
10					SPT #6	100		39/50+	R			SPT refusal on coarse material
			GRAVELLY SAND (10.67 to 12.17) Fine to coarse grained with some silt, light brown, non plastic, dry. Some angular to subangular gravel, poorly graded. Cored boulder for last 0.3 m.		SPT #7	100		25/50+	R			SPT refusal on coarse material
	970.0		**GRAVELLY SAND** (12.17 to 14.8) Fine to coarse grained with some silt, light brown, non plastic, slightly moist. Some angular to subangular gravel, poorly graded - clasts up to 0.5 cm. Drilled through boulder from 12.2 to 12.5 m. Cored 0.3 m into bedrock at end of interval.		SPT #8	98		6/21/29	50			SPT refusal on coarse material
15					SPT #9	0		50+	R			SPT refusal on bedrock
			VOLCANICLASTIC (14.8 to 21.41) Greenish grey, porphyritic, fine to coarse grained, moderately weathered, moderately fractured, FeO staining along joints and some FeO infill. Calcite veins and veinlets throughout. Dark grey, subangular xenoliths throughout core.	59				R0				
	965.0			100				R4				
				100				R4				
20				100				R4				20.0 - 24.7 m - lugeon packer test #1 = 5 x 10-7 m/s
			BROKEN ZONE (21.41 to 24.71) Greenish grey, porphyritic, highly fractured and broken, highly weathered, FeO staining along joints, calcite infill along joints. Dark grey, well graded, subangular xenoliths throughout core.	100				R3				
	960.0			93				R3				24.5 - 36.7 m - lugeon packer

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-6

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: East Embankment

Coordinates: 684,757 E , 5,607,168 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 18.28 m, HQ3: 18.28 - 48.70 m

Drillhole No.: DH14-006

Drill Type: Fraste DR239

Total Depth: 48.70 m

Elevation: 982.1 m

Azimuth , Inclination: 0 , -90

Page: 2 of 2

Date Started: 27 Jul 14

Date Completed: 28 Jul 14

Logged by: LEP/MAS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - × (20 40 60 80)	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
30	955.0		**VOLCANICLASTIC** (24.71 to 34.51) Greenish grey, porphyritic, fine to coarse grained, slightly to moderately weathered, moderately fractured, calcite and FeO infill along some joints, possible minor shear zones at 29.51 m and 34.01 m - clay gouge material. Dark grey, well graded, subangular xenoliths throughout core.	100				R3				test #2 = 3 x 10-8 m/s
				98				R3				
				99	UCS#1			R4				
				77				R4				
				100				R4				
	950.0			100				R4				
35				97				R3				
			BROKEN ZONE (34.51 to 36.81) Greenish grey, porphyritic, fine to coarse grained, slightly to moderately weathered, heavily fractured and rubblized in parts. Possible faulted zone - some gouge material present in rubblized material. Some quartz and calcite veins and veinlets throughout.	83				R3				
	945.0			100				R3				36.5 - 48.7 m - lugeon packer test #3 = 4 x 10-8 m/s
			VOLCANICLASTIC (36.81 to 48.71) Greenish grey, porphyritic, fine to coarse grained, mostly fresh and unweathered, moderately fractured - highly fractured over interval 45.71 - 47.21 m, FeO staining along joints and some FeO infill. Calcite veins and veinlets throughout. Dark grey, well graded, subangular xenoliths throughout core.	101				R3				
40				101	UCS#2			R3				
	940.0			100				R3				
				101				R3				
45				100				R3				
				88				R3				
	935.0			93				R3				
			End of Drillhole: 48.7 m Reached Target Depth									

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-6

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Cicada Study - Conveyor Corridor

Coordinates: 685,595 E , 5,608,679 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 38.4 m, HQ3: 38.4 - 100.00 m

Drillhole No.: DH14-007

Drill Type: Fraste DR238

Total Depth: 99.50 m

Elevation: 945.5 m

Azimuth , Inclination: 0 , -90

Page: 1 of 4

Date Started: 29 Jul 14

Date Completed: 2 Aug 14

Logged by: LS/WBG/JAS/MEA

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	DRILLING NOTES
	945.0		**SILTY, GRAVELLY SAND** (0 to 6) Trace clay, some cobbles, trace boulders, fine to coarse grained, subrounded to subangular clasts up to 50cm, mostly range from 2 to 15cm, well graded, low plasticity, brown, compact to dense, massive, damp.		SPT #1	79		12/21/25	46		
					SPT #2	100		10/17/32	49		
					SPT #3	92		13/17/18	35		
5.0	940.0		**SANDY SILT** (6 to 22.4) Trace to some gravel, some clay, fine to coarse grained, subrounded to subangular clasts up to 5cm, gap graded, low to medium plasticity, brown, massive, dense, damp to moist.		SPT #4	100		30/19/17	36		
					SPT #5	100		7/34/19	53		
					SPT #6	100		12/50+	R		SPT refusal on coarse material
10.0	935.0				SPT #7	100		6/11/15	26		
					SPT #8	100		10/18/24	42		
					SPT #9	80		6/18/13	31		
15.0	930.0				SPT #10	62		12/15/15	30		
					SPT #11	69		6/6/10	16		
					SPT #12	70		8/15/17	32		
20.0	925.0				SPT #13	100		6/9/15	24		
					SPT #14	100		20/20/25	45		
			SILT (22.4 to 39.19) Some gravel, trace sand and clay, fine to medium grained, subrounded to subangular clasts, gap graded, low to medium plasticity, grey, massive, dense, moist		SPT #15	100		5/8/15	23		
					SPT #16	100		9/11/13	24		

GENERAL REMARKS:

Hole collapsed during installation.

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-7

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL LOG - NO INSTALLATION, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project
Contractor: Geotech Drilling Services Ltd.
Location: Cicada Study - Conveyor Corridor
Coordinates: 685,595 E , 5,608,679 N
Coordinate System: UTM NAD83 Zone 10
Hole Size ODEX: 0 - 38.4 m, HQ3: 38.4 - 100.00 m

Drillhole No.: DH14-007
Drill Type: Fraste DR238
Total Depth: 99.50 m
Elevation: 945.5 m
Azimuth , Inclination: 0 , -90

Page: 2 of 4
Date Started: 29 Jul 14
Date Completed: 2 Aug 14
Logged by: LS/WBG/JAS/MEA
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	DRILLING NOTES
	920.0		**SILT** (22.4 to 39.19) Some gravel, trace sand and clay, fine to medium grained, subrounded to subangular clasts, gap graded, low to medium plasticity, grey, massive, dense, moist		SPT #17	51		9/16/17	33		
					SPT #18	100		5/11/13	24		
					SPT #19	100		7/12/14	26		
30.0	915.0				SPT #20	89		7/12/15	27		
					SPT #21	100		13/20/26	46		
					SPT #22	100		6/10/13	23		
35.0	910.0				SPT #23	100		6/13/36	49		SPT refusal on coarse material
					SPT #24	100		8/17/27	44		
					SPT #25	100		9/5/31	36		SPT refusal on bedrock
40.0	905.0		**SHEAR ZONE** (39.19 to 47.2) Greenish grey, fine to coarse grained, porphyritic, shear zone containing gouge from 39.19 - 47.2m, marks contact with lower unit.	48				R3			
				67				R2			
				99				R2			
				95				R2			
45.0	900.0			0				R2			
				79				R2			
			PICRITE (47.2 to 78.9) Greenish grey, fine to coarse grained, porphyritic, some irregular calcite veinlets, trace irregular stringers of epidote and chlorite, selective chlorite alteration and hematite fracture infill, trace feature filling pyrite and chalcopyrite locally	80				R3			
				86				R3			

GENERAL REMARKS:
Hole collapsed during installation.

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-7

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL LOG - NO INSTALLATION, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project
Contractor: Geotech Drilling Services Ltd.
Location: Cicada Study - Conveyor Corridor
Coordinates: 685,595 E , 5,608,679 N
Coordinate System: UTM NAD83 Zone 10
Hole Size ODEX: 0 - 38.4 m, HQ3: 38.4 - 100.00 m

Drillhole No.: DH14-007
Drill Type: Fraste DR238
Total Depth: 99.50 m
Elevation: 945.5 m
Azimuth , Inclination: 0 , -90

Page: 3 of 4
Date Started: 29 Jul 14
Date Completed: 2 Aug 14
Logged by: LS/WBG/JAS/MEA
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - × (20 40 60 80)	DRILLING NOTES
	895.0		**PICRITE** (47.2 to 78.9) Greenish grey, fine to coarse grained, porphyritic, some irregular calcite veinlets, trace irregular stringers of epidote and chlorite, selective chlorite alteration and hematite fracture infill, trace feature filling pyrite and chalcopyrite locally.	81				R3			
				80				R3			51.79 - 66.96 m - Falling Head Test #1 - K = 3E-07 m/s
				73				R3			
55.0	890.0			100				R3			
				93	UCS#1			R3			
				97				R3			
60.0	885.0			82				R4			
				100				R3			
				100				R4			
65.0	880.0			100				R3			
				80	TRI#1			R4			
				97				R4			66.69 - 81.84 m - Lugeon Packer Test #2 - K = <1E-08 m/s
				95				R4			
70.0	875.0			98				R4			
				87				R4			
				99				R4			

GENERAL REMARKS:
Hole collapsed during installation.

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-7

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL LOG - NO INSTALLATION, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Cicada Study - Conveyor Corridor

Coordinates: 685,595 E , 5,608,679 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 38.4 m, HQ3: 38.4 - 100.00 m

Drillhole No.: DH14-007

Drill Type: Fraste DR238

Total Depth: 99.50 m

Elevation: 945.5 m

Azimuth , Inclination: 0 , -90

Page: 4 of 4

Date Started: 29 Jul 14

Date Completed: 2 Aug 14

Logged by: LS/WBG/JAS/MEA

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	UCS GRADE / BLOW COUNTS (PER 6")
80.0	865.0	**PICRITE** (47.2 to 78.9) Greenish grey, fine to coarse grained, porphyritic, some irregular calcite veinlets, trace irregular stringers of epidote and chlorite, selective chlorite alteration and hematite fracture infill, trace feature filling pyrite and chalcopyrite locally.	94	UCS#2	R4
			92		R4
			97		R4
		SUGARLOAF DIORITE (78.9 to 80) Medium greenish grey, fine grained, porphyritic, some calcite veinlets, minor epidote and carbonate alteration on joints.	98	TRI#2	R5
			100	UCS#3	R4
		MAFIC VOLCANIC (80 to 81.1) Medium grey, very fine grained, aphanitic, some calcite veinlets.	81		R4
			75		R4
		PICRITE (81.1 to 81.9) Medium grey, very fine grained, aphanitic, slight weathering, some epidote fracture infill.	95		R4
85.0	860.0	**MAFIC VOLCANIC** (81.9 to 85.7) Medium grey, very fine grained, aphanitic, some calcite veinlets, trace blebby pyrite locally.	94		R4
		SUGARLOAF DIORITE (85.7 to 97.5) Grey to green, Medium grained, heterogeneous, fractured, fresh to slightly weathered, patchy epidote and k-feldspar alteration, minor blebby pyrite.	100		R4
			92		R4
90.0	855.0		91		R4
			91		R4
			95		R4
95.0	850.0		55		R4
			91		R4
			100		R4
		PICRITE (97.5 to 99) Light to dark green, fine grained, aphanitic, fresh, pervasive chlorite alteration, a short faulted interval from 98.49 - 98.58 m.	99		R5
			100		R5
		End of Drillhole: 99.5 m Reached Target Depth			

SPT 'N' VALUE

RQD

SPT TEST 'N' VALUES - ×

20 40 60 80

DRILLING NOTES

81.02 - 99.0 m - Lugeon Packer Test #3 - K = 4E-08 m/s

GENERAL REMARKS:

Hole collapsed during installation.

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-7

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL LOG - NO INSTALLATION, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: North Embankment

Coordinates: 683,162 E , 5,608,013 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 44.80 m, HQ3: 44.80 - 71.90 m

Drillhole No.: DH14-008

Drill Type: Fraste DR238

Total Depth: 71.90 m

Elevation: 975.3 m

Azimuth , Inclination: 0 , -90

Page: 1 of 3

Date Started: 29 Jul 14

Date Completed: 31 Jul 14

Logged by: LEP/WBG/MAS/MEA

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
	975.0		**GRAVELLY SILTY SAND** (0 to 16.7) Fine to coarse grained, angular to subangular gravel, brown, medium to high plasticity, very dense, well graded, massive, moist.		SPT #1	100		13/16/28	44			
					SPT #2	100		13/25/31	56			
5	970.0				SPT #3	100		9/29/32	61			
					SPT #4	79		17/21/26	47			Refusal on dense material.
					SPT #5	100		12/42/50+	R			Refusal on rock.
					SPT #6	100		16/25/49	74			Refusal on dense material.
10	965.0				SPT #7	100		10/17/25	42			
					SPT #8	100		9/31/47	78			
					SPT #9	39		20/27/38	65			
15	960.0				SPT #10	100		11/15/38	53			
			SANDY SILTY GRAVEL (16.7 to 36.57) Fine to coarse grained, angular to subangular gravel, grey, medium plasticity, very dense, well graded, massive, moist to wet.		SPT #11	0		50+	R			Refusal on gravel.
					SPT #12	100		14/50+	R			Refusal on gravel.
20	955.0				SPT #13	100		25/50+	R			Refusal on gravel.
					SPT #14	0		50+	R			Refusal on gravel.
					SPT #15	100		9/30/30	60			

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-8

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: North Embankment

Coordinates: 683,162 E , 5,608,013 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 44.80 m, HQ3: 44.80 - 71.90 m

Drillhole No.: DH14-008

Drill Type: Fraste DR238

Total Depth: 71.90 m

Elevation: 975.3 m

Azimuth , Inclination: 0 , -90

Page: 2 of 3

Date Started: 29 Jul 14

Date Completed: 31 Jul 14

Logged by: LEP/WBG/MAS/MEA

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
	950.0		**SANDY SILTY GRAVEL** (16.7 to 36.57) Fine to coarse grained, angular to subangular gravel, grey, medium plasticity, very dense, well graded, massive, moist to wet.		SPT #16	100		11/16/24	40			
					SPT #17	100		13/16/30	46			
30	945.0				SPT #18	100		6/10/15	25			
					SPT #19	100		9/15/16	31			
35	940.0		**SILTY SAND** (36.57 to 41.1) Coarse grained, trace fine grained subangular gravel, orange brown, non plastic, loose to compact, poorly graded, massive, moist.		SPT #20	100		8/7/13	20			
40	935.0		**SANDSTONE** (41.1 to 50.8) Greenish grey, fine grained, strong, thinly laminated, slightly weathered, iron oxide and calcite along joint surfaces.		SPT #21	100		50+	R			Refusal on weathered bedrock.
					SPT #22	100		50+	R			Refusal on weathered bedrock.
45	930.0			100				R5				
				96				R4				48.40 - 53.87 m. Lugeon Packer Test #1 = 2 x 10-8 m/s

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-8

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: North Embankment

Coordinates: 683,162 E , 5,608,013 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 44.80 m, HQ3: 44.80 - 71.90 m

Drillhole No.: DH14-008

Drill Type: Fraste DR238

Total Depth: 71.90 m

Elevation: 975.3 m

Azimuth , Inclination: 0 , -90

Page: 3 of 3

Date Started: 29 Jul 14

Date Completed: 31 Jul 14

Logged by: LEP/WBG/MAS/MEA

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - × (20 40 60 80)	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
	925.0			93				R4				
			FAULT ZONE (50.8 to 55.39) Volcaniclastic - Grey to dark grey, fine grained, extremely weak, gouge present.	100				R4				50.68 - 59.91 m. Lugeon Packer Test #2 = 2 x 10-8 m/s
				101				R1				
				100				R1				
				95				R2				
55	920.0		**VOLCANICLASTIC** (55.39 to 71.91) Grey, fine grained, very strong, brecciated, fresh, calcite and hematite veining.	100				R3				
				100	UCS#1			R5				
				99				R5				
60	915.0			100				R5				59.68 - 65.90 m. Lugeon Packer Test #3 = < 1 x 10-8 m/s
				99	UCS#2			R5				
				97				R5				
65	910.0			100				R5				
				100				R5				
				100				R5				67.18 - 71.91 m. Lugeon Packer Test #4 = 2 x 10-7 m/s
				99	UCS#3			R5				
70	905.0			99				R5				
			End of Drillhole: 71.9 m Reached Target Depth									

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-8

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Downstream of North Embankment

Coordinates: 683,508 E , 5,608,416 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 3.05 m, HQ3: 3.05 - 53.37 m

Drillhole No.: DH14-009

Drill Type: Fraste DR238

Total Depth: 53.37 m

Elevation: 959.6 m

Azimuth , Inclination: 0 , -90

Page: 1 of 3

Date Started: 31 Jul 14

Date Completed: 1 Aug 14

Logged by: LEP/MAS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
			GRAVELLY SAND (0 to 0.8) Angular to subangular, fine to coarse grained; trace silt; well graded, non plastic, brown, massive , compact.									
					SPT #1	0		50+	R			SPT Refusal on bedrock
			VOLCANICLASTIC (0.8 to 13.82) Green and grey; fine grained, porphyritic and massive; tight aperture, competent rock; moderately weathered; strong, trace FeO staining, some calcite veins/veinlets, some small minor rubble zones (< 10 cm).	94				R4				
5	955.0			100	UCS#1			R4				
				95				R4				
				100				R4				6.55 - 17.37 m - Lugeon Packer Test #1 - K = 1E-06 m/s
				94				R4				
10	950.0			100				R4				
				100				R4				
				100				R4				
			BROKEN ZONE (13.82 to 13.97) Very clean broken zone, no soft infill.	98	UCS#2			R4				Run blocked off
15	945.0		**VOLCANICLASTIC** (13.97 to 22.72) Green and grey; fine grained, porphyritic, massive; tight discontinuity aperture; slightly to moderately weathered; medium strong to strong, calcite veins/veinlets and infill, trace FeO infill.	90				R3				
				97				R3				17.15 - 29.37 m - Lugeon Packet Test #2 - K = 6E-07 m/s
				100				R4				
20	940.0			97				R4				
				98				R4				
			RUBBLE ZONE (22.72 to 23.37) Greenish grey diorite; fine grained, massive; highly weathered; very weak, rubblized, altered, crumbly, no infill.	100				R2				
	935.0			100				R4				

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-9

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Downstream of North Embankment

Coordinates: 683,508 E , 5,608,416 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 3.05 m, HQ3: 3.05 - 53.37 m

Drillhole No.: DH14-009

Drill Type: Fraste DR238

Total Depth: 53.37 m

Elevation: 959.6 m

Azimuth , Inclination: 0 , -90

Page: 2 of 3

Date Started: 31 Jul 14

Date Completed: 1 Aug 14

Logged by: LEP/MAS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - × (20 40 60 80)	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
			VOLCANICLASTIC (23.37 to 33.87) Grey to greenish grey; fine grained, porphyritic, massive; fresh to slightly weathered; medium strong to strong, calcite veins, veinlets and infill, trace FeO infill, trace quartz banding and clasts.	100				R4				
				100				R4				
				97				R4				
30	930.0			99				R3				29.15 - 41.37 m - Lugeon Packer Test #3 - K = 5E-08 m/s
				100				R3				
				100				R3				
			VOLCANICLASTIC (33.87 to 39.87) Greenish grey with grey clasts (0.5 cm to 8 cm in diameter); fine grained, porphyritic, massive; fresh to slightly weathered; medium strong, trace calcite infill, trace FeO staining.	98				R3				
35	925.0			100				R3				
				100	UCS#3			R3				
				97				R3				
40	920.0		**VOLCANICLASTIC** (39.87 to 53.37) Grey to greenish grey; fine grained, porphyritic, massive; fresh; strong, trace calcite infill, trace angular to rounded phenocrysts (~5 cm in diameter), trace FeO staining.	99				R4				
				100				R4				
				100				R4				
45	915.0			100				R4				41.15 - 53.37 m - Lugeon Packer Test #4 - K = 7E-08 m/s
				100				R3				
				97				R4				
	910.0			100				R4				

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-9

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Downstream of North Embankment

Coordinates: 683,508 E , 5,608,416 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 3.05 m, HQ3: 3.05 - 53.37 m

Drillhole No.: DH14-009

Drill Type: Fraste DR238

Total Depth: 53.37 m

Elevation: 959.6 m

Azimuth , Inclination: 0 , -90

Page: 3 of 3

Date Started: 31 Jul 14

Date Completed: 1 Aug 14

Logged by: LEP/MAS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - × (20 40 60 80)	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
			VOLCANICLASTIC (39.87 to 53.37) Grey to greenish grey; fine grained, porphyritic, massive; fresh; strong, trace calcite infill, trace angular to rounded phenocrysts (~5 cm in diameter), trace FeO staining.	100				R4				
				100				R4				
			End of Drillhole: 53.37 m Reached Target Depth									
55	905.0											
60	900.0											
65	895.0											
70	890.0											
	885.0											

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-9

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: North Embankment

Coordinates: 683,439 E , 5,608,285 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 3.10 m, HQ3: 3.10 - 53.70 m

Drillhole No.: DH14-010

Drill Type: Fraste DR238

Total Depth: 53.70 m

Elevation: 950.8 m

Azimuth , Inclination: 0 , -90

Page: 1 of 3

Date Started: 2 Aug 14

Date Completed: 4 Aug 14

Logged by: LEP/MAS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
	950.0	**SILTY SAND** (0 to 2.5) Fine to coarse grained; trace gravel, fine to coarse grained, angular to subangular; some silt; well graded, low plasticity, brown, massive, compact, dry to moist.		SPT #1	100		10/10/13	23			SPT refusal on bedrock
		VOLCANICLASTIC (2.5 to 8.6) Greenish grey with grey clasts (up to 6 cm in diameter); fine grained, porphyritic, massive; slightly to moderately weathered; strong, FeO infill and staining.	100	SPT #2	0		50+	R			SPT refusal on bedrock
5	945.0		100				R4				
			100				R4				5.75 - 12.70 m - Lugeon Packer Test #1 - K = 7E-08 m/s
			100				R4				
			98				R4				
10	940.0	**VOLCANICLASTIC** (8.6 to 15.7) Greenish grey with some light purplish colouring; fine grained, porphyritic, massive; fresh to slightly weathered; strong, calcite veinlets, FeO staining, small (~5 cm) rubble zone at 13.38 m.	95				R4				
			97				R3				
			100				R3				12.48 - 18.70 m - Lugeon Packer Test #2 - no take
			100				R3				
15	935.0	**VOLCANICLASTIC** (15.7 to 26.2) Greenish grey with grey clasts (subangular to subrounded, ~5 cm in diameter); fine grained, porphyritic, massive; fresh to slightly weathered; strong, calcite veinlets, trace FeO staining, trace yellowish infill.	100				R4				
			95	UCS#1			R4				
			100				R4				18.48 - 24.70 m - Lugeon Packer Test #3 - K = 6E-08 m/s
20	930.0		100				R4				
			100				R4				
			100				R4				
			100				R4				24.48 - 30.69 m - Lugeon

GENERAL REMARKS:

Artesian Well

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-10

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: North Embankment

Coordinates: 683,439 E , 5,608,285 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 3.10 m, HQ3: 3.10 - 53.70 m

Drillhole No.: DH14-010

Drill Type: Fraste DR238

Total Depth: 53.70 m

Elevation: 950.8 m

Azimuth , Inclination: 0 , -90

Page: 2 of 3

Date Started: 2 Aug 14

Date Completed: 4 Aug 14

Logged by: LEP/MAS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
	925.0			100				R4				Packer Test #4 - no take
			VOLCANICLASTIC (26.2 to 30.7) Reddish grey with white phenocrysts; fine grained, porphyritic, foliated/bedded; some healed joints; slightly weathered; strong, heavy quartz and calcite veining, FeO staining and banding, trace green alteration.	100				R4				
				100				R4				
30				98				R4				28.98 - 36.70 m - Lugeon Packer Test #5 - no take
	920.0		**VOLCANICLASTIC** (30.7 to 34.48) Grey to greenish grey; fine grained, porphyritic, massive; fresh to slightly weathered; strong, some FeO staining and banding, some calcite veinlets and infill, large quartz vein, some grey clasts.	100				R4				
				100				R4				
				100				R4				
35			**FAULT ZONE** (34.48 to 35.2) Highly weathered to completely weathered; clay like rubble, possibly fault gouge; very soft. Potentially a shear zone and not a fault zone.	88				R2				
	915.0			100				R2				
			RUBBLE ZONE (35.2 to 38.2) Greenish grey; very little fines, FeO and calcite veinlets throughout, lots of dissolution on larger rubble fragments, increased fine content in last 30 cm of rubble zone.	93				R2				36.48 - 42.70 m - Lugeon Packer Test #6 - K = 1E-08 m/s
				100				R4				
			VOLCANICLASTIC (38.2 to 51.7) Yellowish grey to greenish grey; fine grained, porphyritic, massive; fresh to slightly weathered; strong, quartz banding (~ 1 cm thick), grey clasts (up to 8 cm in diameter), small rubble zones (4-6 cm thick) at 43.40 m and 46.20 m.	100				R3				
40	910.0			100				R4				
				97				R4				42.48 - 48.70 m - Lugeon Packer Test #7 - K = <1E-08 m/s
				99				R4				
45	905.0			100				R4				
				99	UCS#2			R4				
				97				R4				48.48 - 54.70 m - Lugeon Packer Test #8 - K = 3E-08 m/s

GENERAL REMARKS:

Artesian Well

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-10

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project
Contractor: Geotech Drilling Services Ltd.
Location: North Embankment
Coordinates: 683,439 E , 5,608,285 N
Coordinate System: UTM NAD83 Zone 10
Hole Size ODEX: 0 - 3.10 m, HQ3: 3.10 - 53.70 m

Drillhole No.: DH14-010
Drill Type: Fraste DR238
Total Depth: 53.70 m
Elevation: 950.8 m
Azimuth , Inclination: 0 , -90

Page: 3 of 3
Date Started: 2 Aug 14
Date Completed: 4 Aug 14
Logged by: LEP/MAS
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
	900.0			100				R4				
			VOLCANICLASTIC (51.7 to 53.7) Purplish greenish grey; fine grained, porphyritic, massive; many healed fractures; slightly weathered; strong, many calcite veinlets, some purplish brown clay-like infill on some joints.	100				R4				
				100				R4				
55	895.0		End of Drillhole: 53.7 m Reached Target Depth									
60	890.0											
65	885.0											
70	880.0											

GENERAL REMARKS:
Artesian Well

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-10

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Cicada Study - SMRSF

Coordinates: 685,850 E , 5,607,939 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 2.74 m, HQ3: 2.74 - 99.70m

Drillhole No.: DH14-011

Drill Type: Fraste DR238

Total Depth: 99.70 m

Elevation: 996.1 m

Azimuth , Inclination: 0 , -90

Page: 1 of 4

Date Started: 2 Aug 14

Date Completed: 6 Aug 14

Logged by: MEA/WBG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE
0	995.0		**GRAVELLY SILT** (0 to 1.5) Fine to medium, subangular to angular; some sand, fine to medium; some cobbles, small, rounded; well graded, non plastic, brownish grey, dense, dry.		SPT #1	62		10/14/16	30
			SANDY SILTY GRAVEL (1.5 to 1.8) Fine to coarse, subangular to angular; silt, no plasticity; sand, fine to medium; well graded, brownish grey, dry. Highly weathered bedrock.		SPT #2	0		50+	R
5	990.0		**VOLCANICLASTIC** (1.8 to 44.8) Light to dark greenish grey, fine to medium grained, porphyritic, heterogeneous, fresh to slight weathering, minor irregular quartz and calcite veining, interval broken and rubbly from 12.7 - 20.2m with short gouge zones locally visible from 14.1 - 16.9m	96				R4	
				94				R4	
				95				R4	
				93				R4	
10	985.0			94				R4	
				96				R4	
				85				R3	
15	980.0			100				R2	
				96				R2	
				87				R4	
				41				R2	
20	975.0			60				R4	
				95				R4	
				100				R4	
				0	UCS#1				

RQD

SPT TEST 'N' VALUES - 20 40 60 80

INSTRUMENTATION / WELL DETAILS

DRILLING NOTES

SPT refusal on bedrock

5.88 - 17.20 m - Lugeon Packer Test #1 - K = <1E-08 m/s

16.95 - 32.40 m - Lugeon Packer Test #2 - K = 3E-08 m/s

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-11

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Cicada Study - SMRSF

Coordinates: 685,850 E , 5,607,939 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 2.74 m, HQ3: 2.74 - 99.70m

Drillhole No.: DH14-011

Drill Type: Fraste DR238

Total Depth: 99.70 m

Elevation: 996.1 m

Azimuth , Inclination: 0 , -90

Page: 2 of 4

Date Started: 2 Aug 14

Date Completed: 6 Aug 14

Logged by: MEA/WBG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
	970.0		**VOLCANICLASTIC** (1.8 to 44.8) Light to dark greenish grey, fine to medium grained, porphyritic, heterogeneous, fresh to slight weathering, minor irregular quartz and calcite veining, interval broken and rubbly from 12.7 - 20.2m with short gouge zones locally visible from 14.1 - 16.9m	100				R5				
				100	TRI#1			R5				
				92				R5				
30				100				R5				
	965.0			94	UCS#2			R5				30.97 - 48.70 m - Lugeon Packer Test #3 - K = <1E-08 m/s
				98				R5				
				75				R5				
35				100				R5				
	960.0			100				R5				
				100				R5				
				100				R5				
				100				R5				
40				100				R5				
	955.0			100				R5				
				100				R5				
				100				R5				
				100				R5				
45			**LATE SUGARLOAF DIORITE** (44.8 to 49.1) Pale to medium greenish grey, coarse grained, porphyritic, slight to moderate weathering, trace hematite, calcite and epidote stringers, moderate oxidation, hematite and chlorite alteration, a short gouge zone from 47.6 - 47.75m.	70				R5				
	950.0			91				R5				
				93				R5				48.51 - 63.70 m - Lugeon Packer Test #4 - K = <1E-08 m/s

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-11

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Cicada Study - SMRSF

Coordinates: 685,850 E , 5,607,939 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 2.74 m, HQ3: 2.74 - 99.70m

Drillhole No.: DH14-011

Drill Type: Fraste DR238

Total Depth: 99.70 m

Elevation: 996.1 m

Azimuth , Inclination: 0 , -90

Page: 3 of 4

Date Started: 2 Aug 14

Date Completed: 6 Aug 14

Logged by: MEA/WBG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
	945.0		**VOLCANICLASTIC** (49.1 to 55.8) Medium greenish grey, fine to medium grained, heterogeneous, fresh to slightly weathered, minor calcite and hematite infillled stringers, weak oxidation and hematite alteration and pervasive chlorite and epidote alteration throughout.	78				R5				
				100				R4				
				100				R4				
55				100				R4				
	940.0		**LATE SUGARLOAF DIORITE** (55.8 to 60) Medium grey, coarse grained, porphyritic, slightly weathered, trace irregular calcite and hematite veins, moderate epidote and chlorite alteration with weak fracture oxidation.	96				R4				
				100				R4				
				100				R4				
60				100				R4				
	935.0		**VOLCANICLASTIC** (60 to 99.7) Light to medium greenish grey, fine to coarse grained, heterogeneous, fresh to moderately weathered, minor irregular cross-cutting calcite veins occasionally vuggy, moderate pervasive epidote and chlorite alteration and weak fracture filling oxidation.	100				R4				
				94				R4				62.98 - 78.40 m - Lugeon Packer Test #5 - K = <1E-08 m/s
				93				R4				
65				100				R5				
	930.0			100				R4				
				100				R5				
70				96				R4				
	925.0			59				R4				
				95				R5				

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-11

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project
Contractor: Geotech Drilling Services Ltd.
Location: Cicada Study - SMRSF
Coordinates: 685,850 E , 5,607,939 N
Coordinate System: UTM NAD83 Zone 10
Hole Size ODEX: 0 - 2.74 m, HQ3: 2.74 - 99.70m

Drillhole No.: DH14-011
Drill Type: Fraste DR238
Total Depth: 99.70 m
Elevation: 996.1 m
Azimuth , Inclination: 0 , -90

Page: 4 of 4
Date Started: 2 Aug 14
Date Completed: 6 Aug 14
Logged by: MEA/WBG
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
80	920.0		**VOLCANICLASTIC** (60 to 99.7) Light to medium greenish grey, fine to coarse grained, heterogeneous, fresh to moderately weathered, minor irregular cross-cutting calcite veins occasionally vuggy, moderate pervasive epidote and chlorite alteration and weak fracture filling oxidation.	99				R5				
				96				R4				
				94				R4				
				72				R4				78.54 - 89.21 m - Lugeon Packer Test #6 - K = <1E-08 m/s
	915.0			93				R5				
85				100				R5				
				100	UCS#3			R5				
				100				R5				
	910.0			88				R5				
				92				R5				87.98 - 99.70 m - Lugeon Packer Test #7 - K = <1E-08 m/s
90				100				R5				
				100				R5				
	905.0			61				R5				
				100				R5				
				100				R5				
				100				R5				
95				100				R5				
	900.0			100				R5				
				100				R5				
				100				R5				
				100				R5				
			End of Drillhole: 99.7 m Reached Target Depth									

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-11

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: North Embankment

Coordinates: 682,768 E , 5,608,035 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 27.42 m, HQ3: 27.42 - 72.79 m

Drillhole No.: DH14-012

Drill Type: Fraste DR238

Total Depth: 72.79 m

Elevation: 967.9 m

Azimuth , Inclination: 0 , -90

Page: 1 of 3

Date Started: 4 Aug 14

Date Completed: 6 Aug 14

Logged by: LEP/MAS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
			SANDY SILT WITH GRAVEL (0 to 4.57) Some subangular to subrounded, poorly graded gravel (clasts up to 1.5 cm); medium plasticity, brown, dry to slightly moist. Trace organics.		SPT #1	100		8/14/12	26			
	965.0				SPT #2	100		9/15/15	30			
5			**SILTY SAND WITH GRAVEL** (4.57 to 10.65) Some well graded, fine grained, subangular to angular gravel; fine to coarse grained sand, non-plastic, brown to greyish brown, moist to dry.		SPT #3	100		7/8/13	21			
					SPT #4	100		13/35/23	58			SPT refusal on coarse material
	960.0				SPT #5	100		10/14/19	33			Start injecting water for drilling
10					SPT #6	100		9/16/16	32			
			GRAVELLY SILT WITH SAND (10.65 to 15.24) Some fine to medium grained, subangular, well graded gravel; silt has medium plasticity, brown, compact, massive, dry to slightly moist.		SPT #7	100		6/9/15	24			
	955.0				SPT #8	100		5/5/8	13			
					SPT #9	100		3/8/8	16			
15			**SILTY GRAVEL WITH SAND** (15.24 to 24.38) Subangular to angular, fine to coarse grained, well graded with mixed lithologies; silt and sand are fine to coarse grained, non-plastic to slightly plastic, grey-brown, massive, wet.		SPT #10	100		4/7/7	14			
					SPT #11	100		8/9/11	20			
	950.0				SPT #12	61		5/8/22	30			
20					SPT #13	70		7/20/13	33			
					SPT #14	100		7/11/19	30			
	945.0				SPT #15	100		6/12/9	21			
					SPT #16	100		4/13/50+	R			SPT refusal on bedrock

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-12

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: North Embankment

Coordinates: 682,768 E , 5,608,035 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 27.42 m, HQ3: 27.42 - 72.79 m

Drillhole No.: DH14-012

Drill Type: Fraste DR238

Total Depth: 72.79 m

Elevation: 967.9 m

Azimuth , Inclination: 0 , -90

Page: 2 of 3

Date Started: 4 Aug 14

Date Completed: 6 Aug 14

Logged by: LEP/MAS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - × (20 40 60 80)	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
			WEATHERED BEDROCK (24.38 to 27.42) Orange-brown bedrock chips from ODEX, oxidized, heavily weathered with trace silt present.		SPT #17	0		50+	R			SPT refusal on bedrock
	940.0		**SEDIMENTARY** (27.42 to 28.24) Broken zone, heavily fractured, grey, fine grained, porphyritic, moderate to highly weathered, medium strong with FeO infill along joints, medium strong.	100				R3				
				90				R3				
30			**SEDIMENTARY** (28.24 to 32.29) Grey with FeO staining, fine grained, porphyritic, slightly to moderately weathered, medium strong, some calcite and FeO infilling along joints, some minor calcite veinlets and calcite healed fractures. Rock is weakly to well foliated.	98				R3				
				100				R3				30.6 - 36.8 m - Lugeon Packer Test #1 - no take
	935.0		**SEDIMENTARY** (32.29 to 48.79) Grey, fine grained, porphyritic, well foliated, trace FeO staining and calcite veinlets, trace quartz with pyrite stringers and blebs. Strong, fresh to moderately weathered and weakly foliated.	100				R4				
				100	TRI#1			R4				
35				99				R4				
				99				R4				36.6 - 42.8 m - Lugeon Packer Test #2 - K = 1E-06 m/s
	930.0			100				R4				
40				97				R4				
				100				R4				
	925.0			100				R4				42.6 - 48.8 m - Lugeon Packer Test #3 - K = 4E-08 m/s
45				100				R4				
				98				R4				
	920.0			100				R4				48.6 - 54.8 m - Lugeon Packer Test #4 - no take
				100				R3				

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-12

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: North Embankment

Coordinates: 682,768 E , 5,608,035 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 27.42 m, HQ3: 27.42 - 72.79 m

Drillhole No.: DH14-012

Drill Type: Fraste DR238

Total Depth: 72.79 m

Elevation: 967.9 m

Azimuth , Inclination: 0 , -90

Page: 3 of 3

Date Started: 4 Aug 14

Date Completed: 6 Aug 14

Logged by: LEP/MAS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
			QUARTZ FELDSPAR PORPHYRY (48.79 to 54.79) Coarse grained, inequigranular, light brown, very weak, fresh and unweathered, light and dark flow banding, moderately fractured with minor calcite veinlets.	100				R3				
	915.0			98				R2				
				99				R2				
55			**QUARTZ FELDSPAR PORPHYRY** (54.79 to 62.29) Light brown, coarse grained material banded with dark, fine grained material, moderately fractured, calcite veinlets, moderately weathered, weak.	100				R3				54.6 - 60.8 m - Lugeon Packer Test #5 - K = 1E-08 m/s
				100				R2				
	910.0			100				R3				
60				100	UCS#1			R3				
				100				R3				60.6 - 66.8 m - Lugeon Packer Test #6 - no take
	905.0		**CONGLOMERATE** (62.29 to 66.79) Fine to coarse grained, porphyritic, reddish brown, iron-rich, medium strong, moderately weathered, brecciated with black and white, subangular clasts (up to 10 cm), calcite infilling along joints.	100				R3				
65				100				R3				
				100				R2				66.6 - 72.8 m - Lugeon Packer Test #7 - K = 1E-08 m/s
	900.0		**CONGLOMERATE** (66.79 to 72.79) Fine to coarse grained, porphyritic, reddish brown, iron-rich, medium strong, moderately weathered, brecciated with black and white subangular clasts (up to 7 cm), calcite infilling along joints.	99				R4				
70				99				R4				
				91				R3				
				100				R4				
	895.0		End of Drillhole: 72.79 m Reached Target Depth									

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-12

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Cicada Study - Plant Site

Coordinates: 686,644 E , 5,608,118 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 4.38 m, HQ3: 4.38 - 101.20 m

Drillhole No.: DH14-013

Drill Type: Fraste DR238

Total Depth: 101.20 m

Elevation: 970.4 m

Azimuth , Inclination: 0 , -90

Page: 1 of 5

Date Started: 6 Aug 14

Date Completed: 8 Aug 14

Logged by: MEA/WBG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
	970.0		**GRAVELLY SANDY SILT** (0 to 3.32) Very fine to coarse angular to subrounded gravel, some cobbles, some clay, low plasticity, gap-graded, brownish-grey, dense, dry.		SPT #1	100		11/24/30	54			
					SPT #2	93		18/34/36	70			
			VOLCANICLASTIC (3.32 to 21.86) Light to medium greenish grey, very fine to coarse grained, aphanitic to porphyritic, heterogeneous, fresh to slightly weathered, minor irregular cross-cutting calcite stringers with some epidote, moderate persistent epidote and chlorite alteration.									SPT refusal on bedrock
5				78				R5				
	965.0			100				R5				4.94 - 21.64 m - lugeon packer test #1 = no take
				100				R5				
				100				R5				
				100				R5				
10				100				R5				
	960.0			100				R5				
				100				R5				
				100				R5				
				100				R5				
15				100				R5				
	955.0			100				R5				
				100				R5				
				100				R5				
				90				R5				
20				93				R5				20.98 - 36.70 m - lugeon packer test #2 = <1 x 10-8 m/s
	950.0		**MICRO FAULTS** (21.86 to 29.1) Green-grey, soft gouge and highly fractured rock infilling along micro faults over this interval.	86				R5				
				100				R5				
				95				R5				
				100				R5				

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-13

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Cicada Study - Plant Site

Coordinates: 686,644 E , 5,608,118 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 4.38 m, HQ3: 4.38 - 101.20 m

Drillhole No.: DH14-013

Drill Type: Fraste DR238

Total Depth: 101.20 m

Elevation: 970.4 m

Azimuth , Inclination: 0 , -90

Page: 2 of 5

Date Started: 6 Aug 14

Date Completed: 8 Aug 14

Logged by: MEA/WBG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
	945.0		**MICRO FAULTS** (21.86 to 29.1) Green-grey, soft gouge and highly fractured rock infilling along micro faults over this interval.	59				R5				
				99				R5				
				89				R5				
30	940.0		**VOLCANICLASTIC** (29.1 to 101.2) Light to medium greenish grey, very fine to coarse grained, aphanitic to porphyritic, heterogeneous, fresh to slightly weathered, minor irregular cross-cutting calcite stringers with some epidote, moderate persistent epidote and chlorite alteration.	97				R5				
				100				R5				
				100				R5				
				100				R5				
35	935.0			100				R5				
				100	TRI#1			R5				36.48 - 51.66 m - lugeon packer test #3 = <1 x 10-8 m/s
				100				R5				
40	930.0			55				R5				
				30				R5				
				100				R5				
45	925.0			100				R5				
				91	UCS#1			R5				
				100				R5				
				100				R5				

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-13

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Cicada Study - Plant Site

Coordinates: 686,644 E , 5,608,118 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 4.38 m, HQ3: 4.38 - 101.20 m

Drillhole No.: DH14-013

Drill Type: Fraste DR238

Total Depth: 101.20 m

Elevation: 970.4 m

Azimuth , Inclination: 0 , -90

Page: 3 of 5

Date Started: 6 Aug 14

Date Completed: 8 Aug 14

Logged by: MEA/WBG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
55	920.0		**VOLCANICLASTIC** (29.1 to 101.2) Light to medium greenish grey, very fine to coarse grained, aphanitic to porphyritic, heterogeneous, fresh to slightly weathered, minor irregular cross-cutting calcite stringers with some epidote, moderate persistent epidote and chlorite alteration.	100				R5				
				100				R5				51.48 - 66.69 m - lugeon packer test #4 = 1 x 10-8 m/s
				100				R5				
	915.0			100				R5				
				100				R5				
				100				R5				
60				100				R5				
	910.0			100				R5				
				100				R5				
				100				R5				
				95				R5				
65	905.0			83				R5				
				96				R5				66.43 - 81.66 m - lugeon packer test #5 = 1 x 10-8 m/s
				73				R5				
70	900.0			93				R5				
				98				R5				
				99				R4				

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-13

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project
Contractor: Geotech Drilling Services Ltd.
Location: Cicada Study - Plant Site
Coordinates: 686,644 E , 5,608,118 N
Coordinate System: UTM NAD83 Zone 10
Hole Size ODEX: 0 - 4.38 m, HQ3: 4.38 - 101.20 m

Drillhole No.: DH14-013
Drill Type: Fraste DR238
Total Depth: 101.20 m
Elevation: 970.4 m
Azimuth , Inclination: 0 , -90

Page: 4 of 5
Date Started: 6 Aug 14
Date Completed: 8 Aug 14
Logged by: MEA/WBG
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
80	895.0		**VOLCANICLASTIC** (29.1 to 101.2) Light to medium greenish grey, very fine to coarse grained, aphanitic to porphyritic, heterogeneous, fresh to slightly weathered, minor irregular cross-cutting calcite stringers with some epidote, moderate persistent epidote and chlorite alteration.	100				R5				
				100				R5				
				96				R5				
				100	TRI#2			R5				
				100				R5				
	890.0			96				R5				
				100				R5				
				95				R4				81.47 - 90.65 m - lugeon packer test #6 = <1 x 10-8 m/s
85				99				R5				
	885.0			100	UCS#3			R5				
				100				R5				
				100				R5				
				100				R5				
90				100				R5				
	880.0			100				R5				90.50 - 101.20 m - lugeon packer test #7 = <1 x 10-8 m/s
				100	UCS#2			R5				
				100				R5				
95	875.0			100				R5				
				100				R5				
				100				R5				
				100				R5				
				100				R5				

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-13

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Cicada Study - Plant Site

Coordinates: 686,644 E , 5,608,118 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 4.38 m, HQ3: 4.38 - 101.20 m

Drillhole No.: DH14-013

Drill Type: Fraste DR238

Total Depth: 101.20 m

Elevation: 970.4 m

Azimuth , Inclination: 0 , -90

Page: 5 of 5

Date Started: 6 Aug 14

Date Completed: 8 Aug 14

Logged by: MEA/WBG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
	870.0			100				R5				
			End of Drillhole: 101.2 m Reached Target Depth									
105	865.0											
110	860.0											
115	855.0											
120	850.0											

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-13

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: North Embankment

Coordinates: 682,117 E , 5,607,227 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 3.05m, HQ3: 3.05 - 51.17m

Drillhole No.: DH14-014

Drill Type: Fraste DR238

Total Depth: 51.17 m

Elevation: 971.6 m

Azimuth , Inclination: 205 , -65

Page: 1 of 3

Date Started: 6 Aug 14

Date Completed: 8 Aug 14

Logged by: LEP/MAS/JBC/AL

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
	970.0		**SILTY, GRAVELLY SAND** (0 to 1.52) Fine to coarse grained with some fine to coarse grained, subangular to subrounded gravel; brown, dry; trace well graded cobbles and boulders.		SPT #1	0						SPT refusal on bedrock
			SILTY SAND (1.52 to 2.8) Fine to coarse grained with some angular gravel; light grey, dry.	108				R3				
			SEDIMENTARY (2.8 to 6.17) Fine grained, light grey, massive, equigranular with moderate weathering, FeO staining along joints with no infilling. Thin calcite veinlets throughout rock, weak foliation, weakly to heavily fractured.	100				R4				
5				100				R3				
	965.0		**SEDIMENTARY** (6.17 to 9.93) Fine grained, highly fractured, brecciated with healed calcite veins, highly chloritized, soft and rubblized.	100				R3				
				98				R3				
				98				R2				
10			**SEDIMENTARY** (9.93 to 12.17) Fine grained, light grey, foliated, minor FeO staining along joints, no infill, moderately weathered, medium strong.	95				R3				
				100				R3				
	960.0		**SEDIMENTARY** (12.17 to 16.67) Fine grained, grey, well foliated, FeO staining along joints, minor calcite veinlets, disseminated sulphides visible throughout rock and joint faces, medium strong.	100				R3				11.95 - 27.17 m - lugeon packer test #1 = 1 x 10-7 m/s
15				100				R3				
				100				R3				
			SEDIMENTARY (16.67 to 19.67) Fine grained, grey, weak to well foliated, fresh to slightly weathered, medium strong.	98				R3				
	955.0			100				R3				
20			**SEDIMENTARY** (19.67 to 24.17) Fine to medium grained, light grey to light green, well foliated, trace FeO staining and calcite infilling along joints, slightly altered and slightly weathered, medium strong.	96				R3				
				100				R4				
	950.0			100				R3				

GENERAL REMARKS:

SPTs collected for material characterization only, SPT blow counts are not applicable because the drillhole is inclined.

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-14

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: North Embankment

Coordinates: 682,117 E , 5,607,227 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 3.05m, HQ3: 3.05 - 51.17m

Drillhole No.: DH14-014

Drill Type: Fraste DR238

Total Depth: 51.17 m

Elevation: 971.6 m

Azimuth , Inclination: 205 , -65

Page: 2 of 3

Date Started: 6 Aug 14

Date Completed: 8 Aug 14

Logged by: LEP/MAS/JBC/AL

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - × (20 40 60 80)	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
			PYROXENE PLAGIOCLASE PORPHYRY (24.17 to 34.48) Fine to medium grained, inequigranular, porphyritic texture, xenolithic with dark, angular phenocrysts (~10 mm), medium strong, trace calcite infilling, mostly fresh and unweathered.	100	UCS#1			R3				
				100				R3				
				99				R3				26.95 - 39.17 m - lugeon packer test #2 = <1 x 10-8 m/s
30	945.0			88				R3				
				100				R3				
				100				R3				
				100				R3				
35	940.0		**SEDIMENTARY** (34.48 to 39.17) Fine to medium grained, light grey to greenish grey, medium strong, some clay and calcite infilling along joints, fresh to slightly weathered. Some quartz banding towards the end.	100				R3				
				100				R3				
				100				R3				
40	935.0		**SEDIMENTARY** (39.17 to 49.67) Light grey, fine to medium grained, weakly to moderately foliated, slightly altered, medium strong, fresh, trace calcite infill along joints. Some calcite veinlets.	98				R3				38.93 - 51.17 m - lugeon packer test #3 = 1 x 10-7 m/s
				98				R3				
				100				R3				
45	930.0			100	UCS#2			R3				
				100				R3				
				100				R3				
				100				R3				

GENERAL REMARKS:

SPTs collected for material characterization only, SPT blow counts are not applicable because the drillhole is inclined.

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-14

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: North Embankment

Coordinates: 682,117 E , 5,607,227 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 3.05m, HQ3: 3.05 - 51.17m

Drillhole No.: DH14-014

Drill Type: Fraste DR238

Total Depth: 51.17 m

Elevation: 971.6 m

Azimuth , Inclination: 205 , -65

Page: 3 of 3

Date Started: 6 Aug 14

Date Completed: 8 Aug 14

Logged by: LEP/MAS/JBC/AL

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - × (20 40 60 80)	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
				100				R3				
55	925.0		End of Drillhole: 51.17 m Reached Target Depth									
60	920.0											
65	915.0											
70	910.0											
	905.0											

GENERAL REMARKS:

SPTs collected for material characterization only, SPT blow counts are not applicable because the drillhole is inclined.

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-14

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Downstream of North Embankment

Coordinates: 682,314 E , 5,607,922 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 33.22m, HQ3: 33.22 - 75.13m

Drillhole No.: DH14-015

Drill Type: Fraste DR238

Total Depth: 74.50 m

Elevation: 973 m

Azimuth , Inclination: 0 , -90

Page: 1 of 3

Date Started: 8 Aug 14

Date Completed: 9 Aug 14

Logged by: AL

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	MATERIAL DESCRIPTION	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	BLOW COUNTS (PER 6")	UCS GRADE	SPT 'N' VALUE	DRILLING NOTES
0	970.0	**SAND** (0 to 4.27) Fine to coarse grained, angular to subangular, well graded, with some silt and fine gravel, grey, moist to dry.	SPT #1	100		50+		R	SPT refusal on coarse material
			SPT #2	84		21/32/41		73	
5		**SAND AND GRAVEL** (4.27 to 7.31) Fine to coarse grained, subangular to subrounded, well graded, light to dark grey, dry, low to medium plasticity, trace silt.	SPT #3	100		19/50+		R	SPT refusal on coarse material
			SPT #4	92		50+		R	SPT refusal on dense material
	965.0	**SAND AND GRAVEL** (7.31 to 8.83) Some silt; fine to coarse grained, angular to subrounded, well graded, medium plasticity, moist.	SPT #5	100		50/50+		R	SPT refusal on coarse material
10		**SILT AND GRAVEL** (8.83 to 17.98) Some sand; fine to coarse grained, subangular to subrounded, well graded, medium to high plasticity, grey to dark grey, wet. Cored boulder for last 0.6 m.	SPT #6	100		16/22/20		42	
			SPT #7	100		16/32/51		83	
			SPT #8	100		14/32/50+		R	SPT refusal on dense material
	960.0		SPT #9	100		19/27/50		77	
15			SPT #10	100		21/37/50+		R	SPT refusal on dense material
			SPT #11	100		20/15/20		35	
	955.0	**GRAVELLY SILT** (17.98 to 26.33) Some sand and trace boulders and cobbles; fine to coarse grained, subangular to subrounded, poorly graded, high plasticity, greenish grey, moist.	SPT #12	32		31/44/50+		R	SPT refusal on bedrock 19.00 - 26.33 m - Coring through boulders and cobbles - No SPTs performed
20									
	950.0								

RQD

SPT TEST 'N' VALUES - 20 40 60 80

INSTRUMENTATION / WELL DETAILS

GENERAL REMARKS:

Dry Well

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-15

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Downstream of North Embankment

Coordinates: 682,314 E , 5,607,922 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 33.22m, HQ3: 33.22 - 75.13m

Drillhole No.: DH14-015

Drill Type: Fraste DR238

Total Depth: 74.50 m

Elevation: 973 m

Azimuth , Inclination: 0 , -90

Page: 2 of 3

Date Started: 8 Aug 14

Date Completed: 9 Aug 14

Logged by: AL

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
			SILTY SAND (26.33 to 28.64) Some gravel; fine to coarse grained, subangular, poorly graded, medium plasticity, dark greenish grey, moist.		SPT #13	100		50+	R			SPT refusal on cobble or boulder
	945.0		**SAND** (28.64 to 31.7) Some gravel; fine to coarse grained sand and fine gravel, subangular to subrounded, well graded, brown, moist.		SPT #14	100		50+	R			SPT refusal on dense material
30					SPT #15	100		31/50+	R			SPT refusal on dense material
	940.0		**SAND AND GRAVEL** (31.7 to 32.61) Some cobbles and boulders; fine to coarse grained, subangular to subrounded, well graded, dense, moist to dry. Bedrock contact at ~32.61 m.	0				R4				
			VOLCANICLASTIC (32.61 to 46.94) Coarse grained, inequigranular, dark greenish grey, slightly weathered, moderately fractured, some well healed fractures infillled with quartz and some quartz veins, some hematite staining along joints with occasional trace clay gouge, strong.	0				R4				
35				95				R4				
	935.0			100				R4				38.33 - 50.75 m - lugeon packer test #1 - no take
				99				R4				
40				99				R4				
	930.0			99				R4				
				99				R4				
45				98				R4				
				102				R4				
	925.0		**SHEAR ZONE** (46.94 to 49) Coarse grained, dark greenish grey with light greenish grey banding, slightly to moderately weathered, many quartz veins and quartz healed fractures, soft hematite stained clayey infill and clay gouge, medium strong.	99				R3				

GENERAL REMARKS:

Dry Well

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-15

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Downstream of North Embankment

Coordinates: 682,314 E , 5,607,922 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 33.22m, HQ3: 33.22 - 75.13m

Drillhole No.: DH14-015

Drill Type: Fraste DR238

Total Depth: 74.50 m

Elevation: 973 m

Azimuth , Inclination: 0 , -90

Page: 3 of 3

Date Started: 8 Aug 14

Date Completed: 9 Aug 14

Logged by: AL

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - × (20 40 60 80)	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
			VOLCANICLASTIC (49 to 59.17) Coarse grained, dark purple and grey, slightly to moderately weathered, lots of healed fractures, some quartz veins and healed joints, sandy soft infill, brittle, medium strong to strong rock.	99				R3				50.52 - 62.94 m - lugeon packer test #2 - 1 x 10-8 m/s
				83				R3				
	920.0			98				R3				
				97				R4				
55				98				R4				
				101				R4				
	915.0			99				R4				
			VOLCANICLASTIC (59.17 to 64.47) Coarse grained, greenish grey with white quartz banding, slightly to moderately weathered, lots of healed fractures and flow banding, some clay infilling along joints, medium strong.	98				R3				
60				100				R4				
	910.0			102				R3				62.71 - 75.13 m - lugeon packer test #3 - no take
			VOLCANICLASTIC (64.47 to 69.04) Coarse grained, purple and greenish grey with white quartz bands, moderately weathered, lots of flow bands and healed fractures, some clay infill along joints, medium strong to strong rock.	87				R3				
65				101				R4				
	905.0			102				R4				
			VOLCANICLASTIC (69.04 to 74.5) Coarse grained, inequigranular, dark greenish grey with white quartz veins, slightly weathered, some quartz infill and soft clay infill along joints, strong.	99				R4				
70				101				R4				
	900.0			101				R4				
				99	UCS#1			R4				
			End of Drillhole: 74.5 m Reached Target Depth									

GENERAL REMARKS:

Dry Well

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-15

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: North Embankment

Coordinates: 682,140 E , 5,607,107 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 4.56 m, HQ3: 4.56 - 51.37 m

Drillhole No.: DH14-016

Drill Type: Fraste DR238

Total Depth: 51.37 m

Elevation: 979.5 m

Azimuth , Inclination: 15 , -65

Page: 1 of 3

Date Started: 8 Aug 14

Date Completed: 9 Aug 14

Logged by: JBC/MAS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
			SAND (0 to 4.56) Fine to coarse grained, trace silt, subangular to subrounded, poorly graded, brown to grey, non-plastic, soft to firm, dry.		SPT #1	100						
					SPT #2	25						
5	975.0		**SEDIMENTARY** (4.56 to 5.87) Grey to greenish grey, fine grained, foliated, altered, medium strong, moderately to slightly weathered.	90	SPT #3	0						SPT refusal on bedrock
				100				R3				
				40				R1				
			FAULT (5.87 to 7.87) Light grey gouge, with angular fragments of felsic rock, highly altered, moderately weathered, weak.	49				R2				
			SEDIMENTARY (7.87 to 12.37) Grey to greenish grey, mostly intact with some broken, rubbly parts, altered, medium strong, slightly to moderately weathered, some chlorite and clay infilling along joints.	100				R2				
10	970.0			100				R3				
				100				R2				
			SEDIMENTARY (12.37 to 16.37) Light greenish grey, fine to medium grained, foliated, altered, some high angle fractures (80-90 degrees to core axis), slightly to moderately weathered, fresh with some minor FeO staining along joint planes and some minor clay and chlorite infilling.	100				R2				
				100				R2				
15	965.0			100				R2				15.15 - 19.87 m - Lugeon Packer Test #1 - no take
			SEDIMENTARY (16.37 to 30.37) Greenish grey, fine to medium grained, foliated, fresh to slightly weathered, some clay and chlorite infill along joints, minor quartz and calcite veinlets. Joints are slightly rough and dipping 45 to 60 degrees relative to core axis.	100				R3				
				100				R3				
20	960.0			100				R3				19.65 - 27.37 m - Lugeon Packer Test #2 - K = 9E-08 m/s
				100				R3				
				100	UCS#1			R3				

GENERAL REMARKS:

SPTs collected for material characterization only, SPT blow counts are not applicable because the drillhole is inclined.

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-16

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: North Embankment

Coordinates: 682,140 E , 5,607,107 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 4.56 m, HQ3: 4.56 - 51.37 m

Drillhole No.: DH14-016

Drill Type: Fraste DR238

Total Depth: 51.37 m

Elevation: 979.5 m

Azimuth , Inclination: 15 , -65

Page: 2 of 3

Date Started: 8 Aug 14

Date Completed: 9 Aug 14

Logged by: JBC/MAS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - × (20 40 60 80)	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
			SEDIMENTARY (16.37 to 30.37) Greenish grey, fine to medium grained, foliated, fresh to slightly weathered, some clay and chlorite infill along joints, minor quartz and calcite veinlets. Joints are slightly rough and dipping 45 to 60 degrees relative to core axis.	100				R3				
	955.0			100				R3				27.15 - 33.37 m - Lugeon Packer Test #3 - no take
				98				R3				
30				100				R3				
			SEDIMENTARY (30.37 to 31.87) Light grey to green, fine grained, foliated, altered, moderately weathered. Shear zone with ~20 cm clay gouge at end of run.	100				R3				
	950.0		**SEDIMENTARY** (31.87 to 37.87) Greenish grey to green, fine to coarse grained, foliated, altered, fresh, medium strong. Some disseminated sulphides throughout rock. Localized minor clay and calcite infilling along joints.	100	UCS#2			R4				33.15 - 39.37 m - Lugeon Packer Test #4 - K = 1E-08 m/s
35				100				R4				
				100				R4				
				100				R4				
	945.0		**SEDIMENTARY** (37.87 to 51.37) Greenish grey to green, fine to coarse grained, foliated, altered, fresh, strong. Lots of disseminated sulphides throughout rock. No infilling along joints.	100				R4				
40				100				R4				39.15 - 45.37 m - Lugeon Packer Test #5 - K = 3E-08 m/s
				100				R4				
				100				R4				
	940.0			100				R4				
45				100				R4				
				98				R4				45.15 - 51.37 m - Lugeon Packer Test #6 - K = 3E-08 m/s
				100				R4				
	935.0			100				R4				

GENERAL REMARKS:

SPTs collected for material characterization only, SPT blow counts are not applicable because the drillhole is inclined.

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-16

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: North Embankment

Coordinates: 682,140 E , 5,607,107 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 4.56 m, HQ3: 4.56 - 51.37 m

Drillhole No.: DH14-016

Drill Type: Fraste DR238

Total Depth: 51.37 m

Elevation: 979.5 m

Azimuth , Inclination: 15 , -65

Page: 3 of 3

Date Started: 8 Aug 14

Date Completed: 9 Aug 14

Logged by: JBC/MAS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - × (20 40 60 80)	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
				100	UCS#3			R4				
			End of Drillhole: 51.37 m Reached Target Depth									
55	930.0											
60	925.0											
65	920.0											
70	915.0											

GENERAL REMARKS:

SPTs collected for material characterization only, SPT blow counts are not applicable because the drillhole is inclined.

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-16

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project
Contractor: Geotech Drilling Services Ltd.
Location: Cicada Study / ELFZ? - SMRSF
Coordinates: 686,633 E , 5,606,963 N
Coordinate System: UTM NAD83 Zone 10
Hole Size ODEX: 0 - 13.34 m, HQ3: 13.34 - 101.00 m

Drillhole No.: DH14-017
Drill Type: Fraste DR238
Total Depth: 101.00 m
Elevation: 978 m
Azimuth , Inclination: 0 , -90

Page: 1 of 5
Date Started: 9 Aug 14
Date Completed: 12 Aug 14
Logged by: MEA/WBG
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
			CLAYEY SILT (0 to 2.7) Some gravel, some cobbles, subangular to subrounded up to 4cm, medium brown, low plasticity, compact, gap graded, compact, moist.		SPT #1	79		8/12/18	24			
	975.0		**GRAVELLY SILT** (2.7 to 4.2) Some sand, some clay, subangular to subrounded clasts to 3cm, medium brown, gap graded, low to medium plasticity, compact to dense, moist.		SPT #2	100		9/16/18	34			
5			**CLAYEY SILT** (4.2 to 7.3) Trace cobble, some sand, medium brown, gap graded, medium plasticity, dense, wet, low recovery likely due to a boulder or cobble.		SPT #3	28		3/50/22	72			
					SPT #4	100		8/20/25	45			
	970.0		**GRAVELLY SILT** (7.3 to 10.3) Some sand, some cobbles, angular reddish clasts up to 4cm, brown, gap graded, low medium plasticity, dense, wet-saturated.		SPT #5	85		12/18/31	49			
					SPT #6	70		19/21/34	55			
10			**SILTY CLAY** (10.3 to 12.4) Some gravel, trace sand, greyish brown, gap-graded, medium to high plasticity, dense, wet to saturated.		SPT #7	100		9/19/19	38			
					SPT #8	96		11/11/22	33			
	965.0		**MAFIC VOLCANIC** (12.4 to 45.9) Medium greenish grey, very fine to fine grained, aphanitic, fresh to slightly weathered, trace irregular calcite stringers with secondary hematite alteration, moderate to strong chlorite, hematite and epidote alteration throughout, some gouge infill.	62				R4				SPT refusal on bedrock
15				27				R4				14.6 - 29.0 m - lugeon packer test #1 = 3 x 10-8 m/s
				87				R4				
	960.0			81				R4				
				79				R4				
20				100				R4				
				94				R4				
	955.0			78				R4				

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-17

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Cicada Study / ELFZ? - SMRSF

Coordinates: 686,633 E , 5,606,963 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 13.34 m, HQ3: 13.34 - 101.00 m

Drillhole No.: DH14-017

Drill Type: Fraste DR238

Total Depth: 101.00 m

Elevation: 978 m

Azimuth , Inclination: 0 , -90

Page: 2 of 5

Date Started: 9 Aug 14

Date Completed: 12 Aug 14

Logged by: MEA/WBG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - × (20 40 60 80)	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
30	950.0		**MAFIC VOLCANIC** (12.4 to 45.9) Medium greenish grey, very fine to fine grained, aphanitic, fresh to slightly weathered, trace irregular calcite stringers with secondary hematite alteration, moderate to strong chlorite, hematite and epidote alteration throughout, some gouge infill.	95	TRI#1			R4				
				94				R4				
				97				R4				
				85				R3				28.8 - 44.0 m - lugeon packer test #2 = <1 x 10-8 m/s
				67				R3				
35	945.0			100				R5				
				81				R4				
				100				R4				
				100	UCS#1			R4				
40	940.0			94				R4				
				100				R4				
				100				R5				
	935.0			100				R4				
45				100				R4				43.8 - 59.0 m - lugeon packer test #3 = <1 x 10-8 m/s
			FAULT ZONE (45.9 to 52.3) Fractured and broken zone within Mafic Volcanic unit.	93				R5				
	930.0			92				R5				
				86				R5				

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-17

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Cicada Study / ELFZ? - SMRSF

Coordinates: 686,633 E , 5,606,963 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 13.34 m, HQ3: 13.34 - 101.00 m

Drillhole No.: DH14-017

Drill Type: Fraste DR238

Total Depth: 101.00 m

Elevation: 978 m

Azimuth , Inclination: 0 , -90

Date Started: 9 Aug 14

Date Completed: 12 Aug 14

Logged by: MEA/WBG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	MATERIAL DESCRIPTION	RUN RECOVERY (%)	BLOW COUNTS (PER 6")	UCS GRADE	SPT 'N' VALUE
		FAULT ZONE (45.9 to 52.3) Fractured and broken zone within Mafic Volcanic unit.	77	R5		
			66	R5		
			100	R4		
	925.0	**VOLCANICLASTIC** (52.3 to 70.4) Light to medium greenish grey, very fine to medium grained, heterogeneous, fresh to moderately weathered, trace irregular calcite stringers with secondary hematite alteration, moderate pervasive chlorite alteration and hematite fracture infill throughout	97	R5		
			74	R5		
			78	R5		
55			100	R5		
			100	R5		
	920.0		100	R5		
			100	R5		
60			98	R5		
			99	R5		
	915.0		99	R5		
			100	R5		
65			75	R2		
			89	R4		
			100	R2		
		(66.3) 20 cm gouge and gravel zone within unit.	92	R4		
	910.0		100	R4		
70			85	R4		
		FAULT ZONE (70.4 to 72.1) Fractured and gouge filled zone within Volcaniclastic unit.	100	R1		
	905.0	**VOLCANICLASTIC** (72.1 to 74.7) Light to medium greenish grey, very fine to medium grained, heterogeneous, fresh to moderately weathered, trace irregular calcite stringers with secondary hematite alteration, moderate pervasive chlorite alteration and hematite fracture infill	85	R4		
			100	R4		

RQD

SPT TEST 'N' VALUES - × 20 40 60 80

INSTRUMENTATION / WELL DETAILS

DRILLING NOTES

58.8 - 74.0 m - lugeon packer test #4 = no take

73.8 0 89.0 m - lugeon packer test #5 = 1 x 10-8 m/s

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-17

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

PAGE B-959

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project
Contractor: Geotech Drilling Services Ltd.
Location: Cicada Study / ELFZ? - SMRSF
Coordinates: 686,633 E , 5,606,963 N
Coordinate System: UTM NAD83 Zone 10
Hole Size ODEX: 0 - 13.34 m, HQ3: 13.34 - 101.00 m

Drillhole No.: DH14-017
Drill Type: Fraste DR238
Total Depth: 101.00 m
Elevation: 978 m
Azimuth , Inclination: 0 , -90

Page: 4 of 5
Date Started: 9 Aug 14
Date Completed: 12 Aug 14
Logged by: MEA/WBG
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE
		throughout	85				R2	
		FAULT ZONE (74.7 to 78.1) Gouge rich fault zone within volcaniclastic unit.	93	UCS#2			R4	
	900.0		93				R2	
80		**VOLCANICLASTIC** (78.1 to 80.9) Light to medium greenish grey, very fine to medium grained, heterogeneous, fresh to moderately weathered, trace irregular calcite stringers with secondary hematite alteration, moderate pervasive chlorite alteration and hematite fracture infill throughout	100				R4	
			100				R4	
		FAULT ZONE (80.9 to 87) Fault zone within volcaniclastic unit, healed faults noted from 80.9 - 83.0m and 84.23 - 87.0m bounding more broken fault and marks contact with lower mafic unit, weak patchy epidote alteration throughout.	91				R4	
	895.0		76				R4	
85			100				R5	
			100				R5	
		MAFIC VOLCANIC (87 to 88.5) Medium greenish grey, very fine to fine grained, aphanitic, minor irregular calcite (rusty and oxidized) veins, moderate oxidation on fracture planes.	87				R5	
	890.0		100				R5	
			100				R5	
90		**MAFIC VOLCANIC** (88.5 to 90.1) Light to medium greenish grey, coarse grained, porphyritic, strong pervasive epidote alteration with oxidation in fractures and irregular calcite stringers throughout.	100	UCS#3			R5	
			35				R5	
		MAFIC VOLCANIC (90.1 to 101) Medium greenish grey, very fine to fine grained, aphanitic, minor irregular calcite (rusty and oxidized) veins, moderate persistent epidote and chlorite alteration with moderate oxidation on fracture planes.	59				R5	
	885.0		100				R5	
95			100				R5	
			81				R5	
			66				R5	
	880.0		100				R4	

RQD
SPT TEST 'N' VALUES - ×
20 40 60 80

INSTRUMENTATION / WELL DETAILS

DRILLING NOTES
88.8 - 101.0 m - lugeon packer test #6 = 5 x 10-8 m/s

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-17

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Cicada Study / ELFZ? - SMRSF

Coordinates: 686,633 E , 5,606,963 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 13.34 m, HQ3: 13.34 - 101.00 m

Drillhole No.: DH14-017

Drill Type: Fraste DR238

Total Depth: 101.00 m

Elevation: 978 m

Azimuth , Inclination: 0 , -90

Page: 5 of 5

Date Started: 9 Aug 14

Date Completed: 12 Aug 14

Logged by: MEA/WBG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
				100				R4				
			End of Drillhole: 101 m Reached Target Depth									
105	875.0											
110	870.0											
115	865.0											
120	860.0											
	855.0											

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-17

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Downstream of North Embankment

Coordinates: 681,894 E , 5,607,409 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 3.05 m, HQ3: 3.05 - 42.00 m

Drillhole No.: DH14-018

Drill Type: Fraste DR238

Total Depth: 42.00 m

Elevation: 965.4 m

Azimuth , Inclination: 205 , -65

Page: 1 of 2

Date Started: 9 Aug 14

Date Completed: 11 Aug 14

Logged by: JBC/MAS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
0	965.0		**SILTY SAND** (0 to 2.5) Angular to subangular, some fine grained subangular to subrounded gravel, trace clay; poorly graded, low plasticity, brown to brownish grey, compact to dense, massive, moist to dry.		SPT #1	0						SPT refusal on bedrock
			SEDIMENTARY (2.5 to 19.5) Greenish grey; fine to medium grained, porphrytic; broken zone; medium strong, calcite infill, some coarse grained sand and fine grained gravel throughout.	100				R3				
5				100				R3				
				99				R3				
	960.0			40				R3				5.8 - 18.0 m - lugeon packer test #1 = 9 x 10-7 m/s
				53				R2				
10				100				R2				
				100				R3				
	955.0			100				R3				
				95				R2				
15				100				R3				
	950.0			100				R3				16.3 - 30.0 m - lugeon packer test #2 = 1 x 10-6 m/s
				98				R3				
20			**SEDIMENTARY** (19.5 to 42) Greenish grey; fine to coarse grained, porphyritic, massive; moderately fractured; moderately weathered; medium strong, calcite infill, some rubble infill, calcite veins, some FeO staining, clay infill on one joint, quartz and calcite content increasing with depth.	96				R3				
				99				R3				
	945.0			100				R3				
				100				R3				

GENERAL REMARKS:

SPTs collected for material characterization only, SPT blow counts are not applicable because the drillhole is inclined.

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-18

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Downstream of North Embankment

Coordinates: 681,894 E , 5,607,409 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 3.05 m, HQ3: 3.05 - 42.00 m

Drillhole No.: DH14-018

Drill Type: Fraste DR238

Total Depth: 42.00 m

Elevation: 965.4 m

Azimuth , Inclination: 205 , -65

Page: 2 of 2

Date Started: 9 Aug 14

Date Completed: 11 Aug 14

Logged by: JBC/MAS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - × (20 40 60 80)	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
			SEDIMENTARY (19.5 to 42) Greenish grey; fine to coarse grained, porphyritic, massive; moderately fractured; moderately weathered; medium strong, calcite infill, some rubble infill, calcite veins, some FeO staining, clay infill on one joint, quartz and calcite content increasing with depth.	100				R4				
				100				R4				
	940.0			98				R4				
30					UCS#1							
				100				R4				
				99				R4				31.3 - 42.0 m - lugeon packer test #3 = 9 x 10-7 m/s
	935.0			100				R4				
35				100				R4				
				100				R4				
				100				R4				
	930.0				UCS#2							
40				100				R4				
				100				R4				
			End of Drillhole: 42 m Reached Target Depth									
	925.0											
45												

GENERAL REMARKS:

SPTs collected for material characterization only, SPT blow counts are not applicable because the drillhole is inclined.

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-18

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Downstream of North Embankment

Coordinates: 681,857 E , 5,607,315 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 3.05 m, HQ3: 3.05 - 44.00 m

Drillhole No.: DH14-019

Drill Type: Fraste DR238

Total Depth: 44.00 m

Elevation: 969.9 m

Azimuth , Inclination: 15 , -65

Page: 1 of 2

Date Started: 11 Aug 14

Date Completed: 12 Aug 14

Logged by: JBC/MAS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
			SAND (0 to 3.05) Fine to coarse grained; some gravel, coarse grained, subrounded to rounded; trace cobbles; well graded, non-plastic, brown to greyish brown, moist to dry, compact.		SPT #1	100						Water not used for drilling, SPT refusal on bedrock
					SPT #2	0						Water used for drilling, SPT refusal on bedrock
5	965.0		**SANDSTONE** (3.05 to 15.5) Greenish grey; fine to medium grained, porphrytic; broken zone; medium strong, calcite infill, some coarse grained sand and fine grained gravel throughout.	35				R3				
				63				R4				
				70	UCS#1			R4				
				60				R4				7.8 - 20.0 m - lugeon packer test #1 = 8 x 10-8 m/s
10	960.0			100				R3				
				100				R4				
				100				R4				
				98				R4				
15	955.0		**SANDSTONE** (15.5 to 44) Greenish grey; fine to coarse grained, porphyritic, massive; moderately fractured; moderately weathered; medium strong, calcite infill, some rubble infill, calcite veins, some FeO staining, clay infill on one joint, quartz and calcite content increasing with depth.	99				R4				
				100				R4				
				100				R4				
20				97				R4				
	950.0			100				R4				21.3 - 32.0 m - lugeon packer test #2 = 3 x 10-7 m/s
				99				R4				

GENERAL REMARKS:

SPTs collected for material characterization only, SPT blow counts are not applicable because the drillhole is inclined.

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-19

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Downstream of North Embankment

Coordinates: 681,857 E , 5,607,315 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 3.05 m, HQ3: 3.05 - 44.00 m

Drillhole No.: DH14-019

Drill Type: Fraste DR238

Total Depth: 44.00 m

Elevation: 969.9 m

Azimuth , Inclination: 15 , -65

Page: 2 of 2

Date Started: 11 Aug 14

Date Completed: 12 Aug 14

Logged by: JBC/MAS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - × (20 40 60 80)	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
			SANDSTONE (15.5 to 44) Greenish grey; fine to coarse grained, porphyritic, massive; moderately fractured; moderately weathered; medium strong, calcite infill, some rubble infill, calcite veins, some FeO staining, clay infill on one joint, quartz and calcite content increasing with depth.	100				R4				
				99				R4				
	945.0			100				R5				
30				100				R5				
				100	UCS#2			R5				
				100				R4				31.8 - 44.0 m - lugeon packer test #3 = 1 x 10-8 m/s
	940.0			97				R5				
35				100				R5				
				100				R5				
	935.0			100				R5				
40				100				R5				
				100	UCS#3			R5				
	930.0			100				R5				
45			End of Drillhole: 44 m Reached Target Depth									
	925.0											

GENERAL REMARKS:

SPTs collected for material characterization only, SPT blow counts are not applicable because the drillhole is inclined.

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-19

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Cicada Study / ELFZ? - SMRSF

Coordinates: 685,933 E , 5,607,127 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 10.14 m, HQ3: 10.14 - 101.00 m

Drillhole No.: DH14-020

Drill Type: Fraste DR238

Total Depth: 101.00 m

Elevation: 982.7 m

Azimuth , Inclination: 0 , -90

Page: 1 of 5

Date Started: 12 Aug 14

Date Completed: 16 Aug 14

Logged by: MEA/WBG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
			SILT (0 to 2.5) Some sand, coarse grained; trace gravel, coarse grained, subangular to subrounded, uniformly to poorly graded, non plastic, light to medium brown, loose, damp.		SPT #1	67		11/3/3	6			
	980.0		**SILT** (2.5 to 4.1) Some sand, trace clay, trace cobbles; sand is medium to coarse grained, subangular to angular, uniformly graded; silt has low to medium plasticity, compact, moist.		SPT #2	100		5/6/6	12			
5			**SILTY CLAY** (4.1 to 9.1) Some medium grained, angular to subrounded gravel and subangular cobbles; silty clay has medium to high plasticity, medium brown to grey, dense, moist.		SPT #3	74		5/9/9	18			
					SPT #4	62		4/8/9	17			
	975.0				SPT #5	66		39/17/24	41			
					SPT #6	44		16/22/29	51			
10			**FELDSPAR PORPHYRY INTERMEDIATE** (9.1 to 12.3) Light grey, fine to medium grained, porphyritic, fresh, moderate pervasive epidote and chlorite alteration, trace irregular quartz stringers and disseminated pyrite.	89				R5				SPT refusal on bedrock
				100				R5				11.9 - 26.0 m - lugeon packer test #1 = <1 x 10-8 m/s
	970.0		**SANDSTONE** (12.3 to 15.4) Medium greenish grey, fine grained, strong, fresh, moderate pervasive chlorite and sericite alteration, minor quartz calcite veins, trace disseminated pyrite.	98				R5				
15				69				R4				
			FELDSPAR PORPHYRY INTERMEDIATE (15.4 to 19.2) Light grey, fine to medium grained, porphyritic, strong, fresh, moderate pervasive epidote and chlorite alteration, trace irregular quartz stringers and disseminated pyrite.	97				R5				
	965.0			100				R5				
				100				R5				
			SANDSTONE (19.2 to 33) Medium greenish grey, fine grained, strong, fresh, fractured, moderate pervasive chlorite and sericite alteration, minor quartz calcite veins and stringers, trace disseminated pyrite.	98				R4				
20				100	TRI#1			R5				
				100				R5				
	960.0			99				R5				

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-20

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project
Contractor: Geotech Drilling Services Ltd.
Location: Cicada Study / ELFZ? - SMRSF
Coordinates: 685,933 E , 5,607,127 N
Coordinate System: UTM NAD83 Zone 10
Hole Size ODEX: 0 - 10.14 m, HQ3: 10.14 - 101.00 m

Drillhole No.: DH14-020
Drill Type: Fraste DR238
Total Depth: 101.00 m
Elevation: 982.7 m
Azimuth , Inclination: 0 , -90

Date Started: 12 Aug 14
Date Completed: 16 Aug 14
Logged by: MEA/WBG
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
			SANDSTONE (19.2 to 33) Medium greenish grey, fine grained, strong, fresh, fractured, moderate pervasive chlorite and sericite alteration, minor quartz calcite veins and stringers, trace disseminated pyrite.	97				R5				
				100				R5				
	955.0			100				R5				
				95				R5				
30				94				R5				
				100				R5				
	950.0		**SILTSTONE** (33 to 35.8) Medium to dark greenish grey, fine grained, thinly foliated, strong, fresh, moderate pervasive epidote and chlorite alteration, trace irregular quartz-carbonate stringers.	100				R5				
				100				R4				
35				94				R4				34.8 - 50.0 m - lugeon packer test #3 = <1 x 10-8 m/s
			SANDSTONE (35.8 to 40.5) Light to medium greyish green, fine grained, thinly foliated, strong, fresh, moderate pervasive epidote and chlorite alteration, trace irregular calcite veining.	100				R5				
	945.0			93				R5				
				100	UCS#1			R5				
40			**SILTSTONE** (40.5 to 47.6) Medium green and dark grey, fine grained, thinly foliated, strong, fresh, some brecciation at start and end of unit, moderate pervasive epidote and chlorite alteration, trace calcite stringers.	74				R5				
				100				R5				
	940.0			100				R5				
45				100				R5				
				100				R5				
	935.0		**SANDSTONE** (47.6 to 48.9) Light greenish grey, fine grained, massive, strong, fresh, moderate pervasive epidote and chlorite alteration, trace calcite stringers.	100				R5				
				100				R5				
				100				R5				

25.8 - 41.0 m - lugeon packer test #2 = 2 x 10-8 m/s

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-20

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Cicada Study / ELFZ? - SMRSF

Coordinates: 685,933 E , 5,607,127 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 10.14 m, HQ3: 10.14 - 101.00 m

Drillhole No.: DH14-020

Drill Type: Fraste DR238

Total Depth: 101.00 m

Elevation: 982.7 m

Azimuth , Inclination: 0 , -90

Page: 3 of 5

Date Started: 12 Aug 14

Date Completed: 16 Aug 14

Logged by: MEA/WBG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
55	930.0		**SILTSTONE** (48.9 to 56.7) Medium to dark greenish grey, fine grained, thinly foliated, strong, fresh, moderate pervasive epidote and chlorite alteration, trace irregular calcite stringers.	95				R5				49.8 - 62.8 m - lugeon packer test #4 = 5 x 10-8 m/s
				99				R5				
				90				R4				
				97				R5				
				100				R5				
60	925.0		**FAULT ZONE** (56.7 to 70) Fractured and rubbly zone with some gouge within Siltstone unit.	86				R0				
				73				R0				
				70				R0				
				61				R0				
	920.0			34				R0				61.8 - 77.0 m - lugeon packer test #5 = 1 x 10-8 m/s
65				51				R0				
				100				R0				
	915.0			83				R0				
				83				R0				
70				78				R0				
			SILTSTONE (70 to 76.4) Medium to dark greenish grey, fine grained, thinly foliated, strong, fresh, moderate pervasive epidote and chlorite alteration, trace irregular calcite stringers.	100				R4				
	910.0			100				R4				
				76				R5				
				40				R4				
				100				R4				
				100				R4				

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-20

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Cicada Study / ELFZ? - SMRSF

Coordinates: 685,933 E , 5,607,127 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 10.14 m, HQ3: 10.14 - 101.00 m

Drillhole No.: DH14-020

Drill Type: Fraste DR238

Total Depth: 101.00 m

Elevation: 982.7 m

Azimuth , Inclination: 0 , -90

Page: 4 of 5

Date Started: 12 Aug 14

Date Completed: 16 Aug 14

Logged by: MEA/WBG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
					UCS#2							75.5 - 92.0 m - lugeon packer test #6 = <1 x 10-8 m/s
			SANDSTONE (76.4 to 101) Medium greenish grey, fine grained, massive, strong, moderate pervasive epidote and chlorite alteration, some sericite alteration, some simple quartz-carbonate veins, trace blebby pyrite from 76.37 - 83.43 m.	100	TRI#2			R5				
	905.0			100				R5				
				100				R5				
80				100				R5				
	900.0			100				R5				
				100				R5				
85				100				R5				
				100				R5				
	895.0			100				R5				
				100				R5				
90				100				R5				
				100				R5				
	890.0			100				R5				91.8 - 101.0 m - lugeon packer test #7 = 4 x 10-8 m/s
				100				R5				
95				100				R5				
	885.0			100				R5				
				83				R5				

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-20

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Cicada Study / ELFZ? - SMRSF

Coordinates: 685,933 E , 5,607,127 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 10.14 m, HQ3: 10.14 - 101.00 m

Drillhole No.: DH14-020

Drill Type: Fraste DR238

Total Depth: 101.00 m

Elevation: 982.7 m

Azimuth , Inclination: 0 , -90

Page: 5 of 5

Date Started: 12 Aug 14

Date Completed: 16 Aug 14

Logged by: MEA/WBG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
				100				R5				
			End of Drillhole: 101 m Reached Target Depth									
	880.0											
105	875.0											
110	870.0											
115	865.0											
120	860.0											

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-20

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: North Embankment

Coordinates: 682,395 E , 5,606,459 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 21.33 m, HQ3: 21.33 - 54.80 m

Drillhole No.: DH14-021

Drill Type: Fraste DR238

Total Depth: 54.80 m

Elevation: 1022.9 m

Azimuth , Inclination: 0 , -90

Page: 1 of 3

Date Started: 12 Aug 14

Date Completed: 14 Aug 14

Logged by: JBC/MAS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
			SILT (0 to 1.52) Some poorly graded sand, low plasticity, brown, soft, moist to dry.									
			SILT (1.52 to 3.05) Some fine grained sand, trace fine grained, grey gravel; silt is compact, low to medium plasticity, brown, slightly moist.		SPT #1	100		6/9/13	22			No water used for drilling
	1020.0				SPT #2	100		11/17/34	51			No water used for drilling
5			**SILT** (3.05 to 4.57) Some subangular to subrounded, fine to medium grained gravel; silt is medium to low plasticity, grey, massive, wet.		SPT #3	100		8/20/19	39			Water used for drilling
			GRAVELLY SILT (4.57 to 7.62) Some sand; some subangular to subrounded, fine to medium grained,well graded gravel (up to 1.5 cm); silt and sand is light brown, wet.		SPT #4	100		6/10/15	25			Water used for drilling
	1015.0				SPT #5	98		6/10/12	22			Water used for drilling
			SANDY, GRAVELLY SILT (7.62 to 10.66) Fine to coarse grained sand; silt is high plasticity, light brown, wet; some angular to subangular, well graded, gravel.		SPT #6	95		11/10/8	18			Water used for drilling
10					SPT #7	100		11/16/19	35			Water used for drilling
			SILTY, SANDY GRAVEL (10.66 to 13.72) Subangular to angular, fine to medium grained, multicolored clasts; silt and sand is medium to high plasticity, light brown, compact, wet.		SPT #8	100		6/16/20	36			Water used for drilling
	1010.0				SPT #9	100		6/14/16	30			Water used for drilling
			SANDY, GRAVELLY SILT (13.72 to 18.29) Subangular to angular, fine to coarse grained gravel; trace clay; silt is high plasticity, light brown, compact to dense, wet.		SPT #10	100		15/16/25	41			Water used for drilling
15					SPT #11	100		12/17/26	43			Water used for drilling
	1005.0				SPT #12	100		11/10/50+	R			Water used for drilling, SPT refusal on bedrock
			SILTSTONE (18.29 to 21.33) ODEX chips - Dark grey, fine grained, angular bedrock fragments									
20			**SILTSTONE** (21.33 to 23.28) Grey to bluish grey, fine grained, massive, equigranular, slight foliation, a few calcite veinlets, FeO on joint faces, strong.	78				R4				
	1000.0			100	UCS#1			R4				
				84				R2				23.36 - 30.78 m - lugeon packer test #1 = <1 x 10-8 m/s

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-21

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: North Embankment

Coordinates: 682,395 E , 5,606,459 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 21.33 m, HQ3: 21.33 - 54.80 m

Drillhole No.: DH14-021

Drill Type: Fraste DR238

Total Depth: 54.80 m

Elevation: 1022.9 m

Azimuth , Inclination: 0 , -90

Page: 2 of 3

Date Started: 12 Aug 14

Date Completed: 14 Aug 14

Logged by: JBC/MAS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - × (20 40 60 80)	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
			SILTSTONE (23.28 to 27.78) Grey to dark grey, fine to medium grained, massive, equigranular, slight foliation, sporadic calcite veinlets, some fractured/rubbly sections (up to 20 cm long).	97				R3				
				90				R3				
	995.0		**SILTSTONE** (27.78 to 37.78) Grey, fine to medium grained, foliated, calcite and pyrite infilling with some clay, semi to moderately weathered with sections of fresh rock, strong.	100				R4				
30				95				R3				29.06 - 36.78 m - lugeon packer test #2 = <1 x 10-8 m/s
				100				R4				
	990.0			100				R4				
				100				R4				
35				99				R4				36.56 - 42.78 m - lugeon packer test #3 = 1 x 10-8 m/s
	985.0		**FAULT** (37.78 to 38.28) Grey, highly altered (clay alteration), easily crumbled, soft clay infill, very weak rock.	100				R2				
				100				R4				
40			**SILTSTONE** (38.28 to 42.78) Grey, fine to medium grained, equigranular, foliated, calcite veinlets throughout, some pyrite mineralization, strong, fresh and unweathered.	100	UCS#2			R4				
				100				R4				
	980.0		**SILTSTONE** (42.78 to 50.28) Dark grey, fine to medium grained, equigranular, strong, foliated, calcite veinlets throughout, some clay gouge and calcite infill along joints, minor pyrite, fresh.	100				R4				42.55 - 48.77 m - lugeon packer test #4 = no take
45				100				R4				
				100				R4				
	975.0			100				R4				
				100				R4				48.56 - 54.78 m - lugeon packer test #5 = no take

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-21

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: North Embankment

Coordinates: 682,395 E , 5,606,459 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 21.33 m, HQ3: 21.33 - 54.80 m

Drillhole No.: DH14-021

Drill Type: Fraste DR238

Total Depth: 54.80 m

Elevation: 1022.9 m

Azimuth , Inclination: 0 , -90

Page: 3 of 3

Date Started: 12 Aug 14

Date Completed: 14 Aug 14

Logged by: JBC/MAS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - × (20 40 60 80)	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
55	970.0		**SILTSTONE** (50.28 to 54.78) Grey, fine to medium grained, equigranular, strong, extensive calcite veinlets throughout, some foliation, calcite and clay infill along joints, minor broken zones, fresh and unweathered.	100	UCS#3			R4				
				100				R4				
				100				R4				
			End of Drillhole: 54.8 m Reached Target Depth									
60	965.0											
65	960.0											
70	955.0											
	950.0											

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-21

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: North Embankment

Coordinates: 682,520 E , 5,606,216 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 12.13 m, HQ3: 12.13 - 54.80 m

Drillhole No.: DH14-022

Drill Type: Fraste DR238

Total Depth: 54.80 m

Elevation: 1034.7 m

Azimuth , Inclination: 0 , -90

Page: 1 of 3

Date Started: 14 Aug 14

Date Completed: 18 Aug 14

Logged by: JBC

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
		SILTY SAND AND GRAVEL (0 to 1.52) Fine to coarse grained, subangular to subrounded, various lithologies, trace cobbles (as seen from slump), well graded, non-plastic, brown, loose, dry.		SPT #1	46		10/14/14	28			No water used for drilling
		SILT (1.52 to 6.1) Some clay; some sand, fine to coarse grained, subangular to subrounded; some gravel, fine to coarse grained, subrounded to angular; medium plasticity, brown, loose to compact, soft fines, moist to wet.		SPT #2	0		50+	R			Water used for drilling
5	1030.0			SPT #3	100		5/8/9	17			Water used for drilling
		SANDY SILT (6.1 to 7.62) Some clay; trace gravel, subangular to angular, fine to coarse grained, well graded, dark grey; sandy silt is medium to high plasticity, brown to greyish brown, loose, moist to wet.		SPT #4	84		4/6/8	14			Water used for drilling
				SPT #5	100		4/11/12	23			Water used for drilling
		GRAVELLY SILT (7.62 to 9.14) Fine to coarse grained, subangular to angular gravel; some sand, fine to coarse grained, subangular to subrounded; some clay; well graded, medium plasticity, grey to brownish grey, loose, soft fines, multicolored gravel pieces, moist to wet.		SPT #6	61		10/20/50+	R			Water used for drilling, SPT refusal on very dense material
10	1025.0			SPT #7	0		50+	R			Water used for drilling, SPT refusal on bedrock
		GRAVEL (9.14 to 10.67) Fine to coarse grained, angular to subangular; some sand, fine to coarse grained, subangular to subrounded; fines washed away, well graded, low to non plastic, multicolored gravel pieces, greyish brown, loose, moist to wet.	95				R2				
			93				R1				
		VOLCANICLASTIC (10.67 to 20) Grey to dark grey, fine to medium grained, equigranular, highly to moderately weathered, calcite veinlets, highly fractured.	67				R0				
			73				R1				
			100				R3				
				UCS#1							
15	1020.0		97				R3				18.80 - 24.82 m - lugeon packer test #1 = 1 x 10-8 m/s
		VOLCANICLASTIC (20 to 39.3) Greyish green volcaniclastic, fine to medium grained, inequigranular, foliated, soft calcite infilling and veinlets, medium strong, fresh and unweathered.	100				R4				
			100				R4				
20	1015.0		100				R4				
	1010.0										24.60 - 30.82 m - lugeon

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-22

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: North Embankment

Coordinates: 682,520 E , 5,606,216 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 12.13 m, HQ3: 12.13 - 54.80 m

Drillhole No.: DH14-022

Drill Type: Fraste DR238

Total Depth: 54.80 m

Elevation: 1034.7 m

Azimuth , Inclination: 0 , -90

Page: 2 of 3

Date Started: 14 Aug 14

Date Completed: 18 Aug 14

Logged by: JBC

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
30	1005.0		**VOLCANICLASTIC** (20 to 39.3) Greyish green volcaniclastic, fine to medium grained, inequigranular, foliated, soft calcite infilling and veinlets, medium strong, fresh and unweathered.	100				R4				packer test #2 = 1 x 10-8 m/s
				100				R3				
				97				R3				
				100				R3				
				100				R3				30.60 - 36.82 m - lugeon packer test #3 = 2 x 10-8 m/s
				100				R3				
35	1000.0			100				R3				
				100				R3				
				100				R3				36.60 - 42.82 m - lugeon packer test #4 = 5 x 10-7 m/s
				73				R2				
40	995.0		**FELDSPAR PORPHYRY INTERMEDIATE** (39.3 to 42.8) Dark grey to light grey, fine to medium grained, highly fractured, seams of gouge material, pyrite on rock fragments, moderately to highly weathered, medium strong.	67				R2				
				67				R2				
			VOLCANICLASTIC (42.8 to 54.82) Greyish green brecciated tuff, fine to medium grained, inequigranular, foliated, soft calcite and clay infilling and veinlets, slightly weathered to fresh, medium strong.	99				R3				36.60 - 48.82 m - lugeon packer test #5 = 2 x 10-7 m/s. Seated in same spot as test #4 to avoid rubble zone
45	990.0			99				R3				
				99				R3				
				97				R3				
	985.0			95				R3				48.60 - 54.82 m - lugeon packer test #6 = <1 x 10-8 m/s

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-22

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: North Embankment

Coordinates: 682,520 E , 5,606,216 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 12.13 m, HQ3: 12.13 - 54.80 m

Drillhole No.: DH14-022

Drill Type: Fraste DR238

Total Depth: 54.80 m

Elevation: 1034.7 m

Azimuth , Inclination: 0 , -90

Page: 3 of 3

Date Started: 14 Aug 14

Date Completed: 18 Aug 14

Logged by: JBC

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - × (20 40 60 80)	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
			VOLCANICLASTIC (42.8 to 54.82) Greyish green brecciated tuff, fine to medium grained, inequigranular, foliated, soft calcite and clay infilling and veinlets, slightly weathered to fresh, medium strong.	100	UCS#2			R4				
				100				R4				
				99				R4				
55	980.0		End of Drillhole: 54.8 m Reached Target Depth									
60	975.0											
65	970.0											
70	965.0											
	960.0											

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-22

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: TSF Basin

Coordinates: 682,671 E , 5,607,537 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 27.13 m, HQ3: 27.13 - 75.20 m

Drillhole No.: DH14-023

Drill Type: Fraste DR238

Total Depth: 75.00 m

Elevation: 958.2 m

Azimuth , Inclination: 0 , -90

Page: 1 of 3

Date Started: 15 Aug 14

Date Completed: 21 Aug 14

Logged by: AL

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
			SILT (0 to 4.27) Trace fine sand and gravel, subrounded, grey, high plasticity, firm, poorly graded, moist.		SPT #1	85		11/14/16	30			
	955.0				SPT #2	89		8/12/17	29			
5			**GRAVELLY SILT** (4.27 to 11.89) Fine to coarse, angular gravel, some fine to coarse sand, grey, high plasticity, firm, poorly graded, moist.		SPT #3	100		10/18/21	39			
					SPT #4	100		6/16/22	38			Start injecting water for drilling
					SPT #5	24		12/12/14	26			
	950.0											SPT refusal on coarse material
					SPT #6	77		6/15/20	35			
10					SPT #7	100		50+	R			SPT refusal on coarse material
					SPT #8	0		50+	R			SPT refusal on coarse material
	945.0		**SAND** (11.89 to 21.03) Fine to coarse, subrounded, trace silt, brown to greenish grey, well graded, loose to dense, massive to laminated, moist.		SPT #9	92		29/41/50	R			SPT refusal on dense material
15					SPT #10	100		29/35/35	70			
					SPT #11	100		8/35/37	72			
	940.0				SPT #12	97		6/32/36	68			
20					SPT #13	100		0/0/4	4			
			GRAVEL AND SAND (21.03 to 25.6) Fine to coarse, angular to subrounded, trace silt, grey, compact to dense, moist to wet.		SPT #14	100		11/32/50+	R			SPT refusal on dense material
	935.0				SPT #15	69		50+	R			SPT refusal on coarse material
					SPT #16	100		50+	R			SPT refusal on bedrock

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-23

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: TSF Basin

Coordinates: 682,671 E , 5,607,537 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 27.13 m, HQ3: 27.13 - 75.20 m

Drillhole No.: DH14-023

Drill Type: Fraste DR238

Total Depth: 75.00 m

Elevation: 958.2 m

Azimuth , Inclination: 0 , -90

Page: 2 of 3

Date Started: 15 Aug 14

Date Completed: 21 Aug 14

Logged by: AL

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
					SPT #17	100		50+	R			SPT refusal on bedrock
			SILTSTONE (25.6 to 36.02) Black and grey with slightly purple hue, coarse grained, medium strong, thickly laminated, moderately weathered, soft sandy clay infilling, quartz veinlets throughout rock mass.	57				R3				
	930.0			87				R3				
30				99				R3				
				80				R3				
	925.0			100				R3				
35				98				R4				
			FAULT ZONE (36.02 to 46.25) Highly fractured rock with gouge material within siltstone and volcaniclastic unit.	96				R2				
				100				R3				36.88 - 50.82 m. Lugeon Packer Test #1 = <1 x 10-8 m/s
	920.0			100				R3				
40				93				R2				
				66				R2				
				95				R3				
	915.0			82				R3				
45				97				R3				
			VOLCANICLASTIC (46.25 to 58.8) Greenish grey, coarse grained, strong, slightly weathered, purplish surface staining, quartz veinlets throughout rock mass.	100				R3				
	910.0		**SHEAR ZONE** (48.19 to 48.7) Sheared within unit, some gouge.	94				R4				

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-23

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: TSF Basin

Coordinates: 682,671 E , 5,607,537 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 27.13 m, HQ3: 27.13 - 75.20 m

Drillhole No.: DH14-023

Drill Type: Fraste DR238

Total Depth: 75.00 m

Elevation: 958.2 m

Azimuth , Inclination: 0 , -90

Page: 3 of 3

Date Started: 15 Aug 14

Date Completed: 21 Aug 14

Logged by: AL

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
			VOLCANICLASTIC (46.25 to 58.8) Greenish grey, coarse grained, strong, slightly weathered, purplish surface staining, quartz veinlets throughout rock mass.	99				R4				
				100				R4				
	905.0			95				R4				
55				100				R4				
				94				R4				52.12 - 63.01 m. Lugeon Packer Test #2 = <1 x 10-8 m/s
				88				R4				
	900.0			67				R4				55.17 - 75.21 m. Lugeon Packer Test #4 - Test abandoned due to poor packer seal.
60			**FAULT ZONE** (58.8 to 67.44) Faulted within unit, some gouge.	91				R2				
			QUARTZ FELDSPAR PORPHYRY (61.55 to 66.95) Pink and grey, coarse grained, weak, highly weathered, decomposed rock present.	73				R2				
	895.0			48				R2				61.26 - 75.21 m. Lugeon Packer Test #3 - Test abandoned due to poor packer seal.
65				85				R2				
				80				R2				
			VOLCANICLASTIC (67.44 to 73.6) Dark grey, coarse grained, medium strong, highly weathered, decomposed rock or quartz infilling.	97				R3				
	890.0			52				R3				
70				48				R2				
				100				R2				
				71				R3				
	885.0		**FAULT ZONE** (73.6 to 75) Faulted within unit, some gouge.	92				R2				
			End of Drillhole: 75 m Reached Target Depth									

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-23

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project
Contractor: Geotech Drilling Services Ltd.
Location: Cicada Study - SMRSF
Coordinates: 686,146 E , 5,607,486 N
Coordinate System: UTM NAD83 Zone 10
Hole Size ODEX: 0 - 7.42 m, HQ3: 7.42 - 101.30 m

Drillhole No.: DH14-024
Drill Type: Fraste DR238
Total Depth: 101.30 m
Elevation: 990 m
Azimuth , Inclination: 0 , -90

Page: 1 of 5
Date Started: 16 Aug 14
Date Completed: 18 Aug 14
Logged by: MEA/WBG
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
			SANDY SILT (0 to 2) Some gravel, medium to dark brown, subangular to subrounded clasts up to 0.5 cm length, gap graded, non plastic, loose, dry.		SPT #1	49		5/8/8	16			
			SILTY CLAY (2 to 4.8) Some gravel, subangular to subrounded clasts to 0.5cm, light brownish grey with some rusty mottled clay, gap graded, medium to high plasticity, dense dry to moist		SPT #2	93		12/22/27	49			
					SPT #3	100		10/12/50+	R			
5	985.0		**NO RECOVERY** (4.8 to 7.4) No Recovery with ODEX		SPT #4	100		50+	R			SPT refusal on weathered bedrock
			SANDSTONE (7.4 to 28.8) Light to medium greenish grey, equigranular, fresh to moderately weathered, minor irregular calcite stringers, trace quartz veins, weak pervasive chlorite and epidote alteration, moderate fracture oxidation from 7.42 to 11.6 m and 21.3 to 30.2 m.	80				R5				SPT refusal on bedrock
				100				R5				
10	980.0			84				R4				9.63 -24.81 m - Lugeon Packer Test #1 - K = 3E-08 m/s
			SHEAR ZONE (11 to 11.6) Highly fractured and broken zone marking contact between fresh and weathered bedrock.	100				R4				
				100				R4				
15	975.0			100				R4				
				100	UCS#1			R4				
				100				R4				
			SHEAR ZONE (18.5 to 19.1) Sheared within unit, some clay within fracture matrix.	87				R4				
20	970.0			100				R5				
			SHEAR ZONE (21.6 to 22.2) Fractured Shear Zone within unit.	100				R5				
				100				R5				24.64 - 39.80 m - Lugeon

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-24

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project
Contractor: Geotech Drilling Services Ltd.
Location: Cicada Study - SMRSF
Coordinates: 686,146 E , 5,607,486 N
Coordinate System: UTM NAD83 Zone 10
Hole Size ODEX: 0 - 7.42 m, HQ3: 7.42 - 101.30 m

Drillhole No.: DH14-024
Drill Type: Fraste DR238
Total Depth: 101.30 m
Elevation: 990 m
Azimuth , Inclination: 0 , -90

Page: 2 of 5
Date Started: 16 Aug 14
Date Completed: 18 Aug 14
Logged by: MEA/WBG
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - × (20 40 60 80)	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
			SANDSTONE (7.4 to 28.8) Light to medium greenish grey, equigranular, fresh to moderately weathered, minor irregular calcite stringers, trace quartz veins, weak pervasive chlorite and epidote alteration, moderate fracture oxidation from 7.42 to 11.6 m and 21.3 to 30.2 m.	100				R4				Packer Test #2 - K = 2E-08 m/s
				73				R4				
				100				R5				
				95				R5				
				100				R5				
30	960.0		**SHEAR ZONE** (28.8 to 31.5) Fractured Shear Zone within unit, some reddish brown staining on joint surfaces.	95				R4				
				100				R5				
			SANDSTONE (31.5 to 54.9) Light to medium greenish grey, equigranular, fresh to moderately weathered, minor irregular carbonate stringers, trace quartz veins, weak pervasive chlorite and epidote alteration, moderate fracture oxidation from 31.5 to 42.35m.	100				R4				
				100				R4				
				100				R4				
				100				R4				
35	955.0			81				R4				
				91				R4				
				66				R5				
				100				R4				
				100				R4				
40	950.0			100				R4				39.65 - 54.80 m - Lugeon Packer Test #3 - K = <1E-08 m/s
				97				R4				
				100	UCS#2			R4				
45	945.0			100				R4				
				100				R4				
				95				R4				
				100				R4				

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-24

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Cicada Study - SMRSF

Coordinates: 686,146 E , 5,607,486 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 7.42 m, HQ3: 7.42 - 101.30 m

Drillhole No.: DH14-024

Drill Type: Fraste DR238

Total Depth: 101.30 m

Elevation: 990 m

Azimuth , Inclination: 0 , -90

Page: 3 of 5

Date Started: 16 Aug 14

Date Completed: 18 Aug 14

Logged by: MEA/WBG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
			SANDSTONE (31.5 to 54.9) Light to medium greenish grey, equigranular, fresh to moderately weathered, minor irregular carbonate stringers, trace quartz veins, weak pervasive chlorite and epidote alteration, moderate fracture oxidation from 31.5 to 42.35m. **MICROFAULT** (51.4 to 51.6) Heavily fractured and gravelly rubble zone within gouge matrix.	100				R4				
				88				R2				
				100				R4				
				100				R4				
				100				R4				
55	935.0		**SILTSTONE** (54.9 to 101.3) Medium greenish grey, fine grained, fresh to slightly weathered, minor irregular quartz-calcite veins throughout, weak pervasive chlorite and epidote alteration throughout, locally some strong pervasive silica, albite-sericite, and serpentine alteration.	89				R4				54.65 - 69.80 m - Lugeon Packer Test #4 - K = <1E-08 m/s
				100				R4				
				99				R4				
				85				R5				
60	930.0			100				R5				
				100				R5				
				100				R5				
				100				R4				
				100				R5				
65	925.0			100	UCS#3			R5				
				100				R5				
				100				R5				68.14 - 84.80 m - Lugeon Packer Test #5 - K = 2E-08 m/s
70	920.0			100				R5				
				100				R5				
				100				R5				

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-24

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
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Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Cicada Study - SMRSF

Coordinates: 686,146 E , 5,607,486 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 7.42 m, HQ3: 7.42 - 101.30 m

Drillhole No.: DH14-024

Drill Type: Fraste DR238

Total Depth: 101.30 m

Elevation: 990 m

Azimuth , Inclination: 0 , -90

Page: 4 of 5

Date Started: 16 Aug 14

Date Completed: 18 Aug 14

Logged by: MEA/WBG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
80	910.0		**SILTSTONE** (54.9 to 101.3) Medium greenish grey, fine grained, fresh to slightly weathered, minor irregular quartz-calcite veins throughout, weak pervasive chlorite and epidote alteration throughout, locally some strong pervasive silica, albite-sericite, and serpentine alteration.	100				R5				
				100				R5				
				100				R5				
				100				R5				
				100				R5				
				100				R5				
				100				R5				
85	905.0			89				R4				84.14 - 101.30 m - Lugeon Packer Test #6 - K = <1E-08 m/s
				100				R4				
				100				R5				
				86				R4				
90	900.0			100				R4				
				100				R4				
				100				R4				
				95				R4				
				100				R4				
95	895.0			100				R5				
				83				R4				
				100				R5				
				100				R5				
				100				R5				
				100				R4				

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-24

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
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Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Cicada Study - SMRSF

Coordinates: 686,146 E , 5,607,486 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 7.42 m, HQ3: 7.42 - 101.30 m

Drillhole No.: DH14-024

Drill Type: Fraste DR238

Total Depth: 101.30 m

Elevation: 990 m

Azimuth , Inclination: 0 , -90

Page: 5 of 5

Date Started: 16 Aug 14

Date Completed: 18 Aug 14

Logged by: MEA/WBG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - × (20 40 60 80)	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
				100				R4				
			End of Drillhole: 101.3 m Reached Target Depth									
105	885.0											
110	880.0											
115	875.0											
120	870.0											

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-24

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: South Embankment

Coordinates: 683,398 E , 5,605,994 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 38.10 m, HQ3: 38.10 - 56.30 m

Drillhole No.: DH14-025

Drill Type: Fraste DR238

Total Depth: 56.30 m

Elevation: 1023.6 m

Azimuth , Inclination: 0 , -90

Page: 1 of 3

Date Started: 18 Aug 14

Date Completed: 22 Aug 14

Logged by: JBC

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
			SANDY SILT AND GRAVEL (0 to 1.52) Fine to coarse grained, subangular to subrounded; trace cobbles (as seen in slump) up to 0.5 m diameter, well graded, non-plastic, multicolored sand and gravel particles, brown, loose, moist to dry.		SPT #1	100		14/14/19	33			No water used for drilling
	1020.0		**SILT** (1.52 to 3.05) Some clay; some gravel, fine to coarse grained, subangular to subrounded; trace sand, fine to coarse grained, subangular to subrounded; well graded, low to non-plastic, brown, multicolored gravel particles, loose, moist to dry.		SPT #2	100		8/13/16	29			No water used for drilling
5					SPT #3	100		8/12/16	28			No water used for drilling
			CLAYEY GRAVEL (3.05 to 4.57) Fine to coarse grained, angular to subangular; some silt; trace sand, fine to coarse grained, subangular to subrounded; well graded, low to non-plastic, brown, multicolored gravel particles, loose, moist to dry.		SPT #4	100		4/7/10	17			No water used for drilling
					SPT #5	100		20/24/22	46			Water used for drilling
	1015.0		**CLAY** (4.57 to 6.1) Some silt; trace gravel, fine to coarse grained, subangular to angular; poorly graded, brown to dark brown, low to medium plasticity, multicolored gravel particles, loose to compact, moist, soft to firm fines.		SPT #6	0		50+	R			Water used for drilling, SPT refusal on boulder
10												No SPT conducted over 10.66 -11.27 m as previous drill run had indicated hard rock.
			CLAYEY SAND AND GRAVEL (6.1 to 15.24) Fine to coarse grained, subangular to subrounded; some gravel, fine to coarse grained, subangular to subrounded; some silt, well graded, medium plasticity, greyish brown, multicolored gravel and sand particles, compact to dense, moist to dry, soft to firm fines.		SPT #7	75		8/21/28	49			Water used for drilling
	1010.0				SPT #8	85		33/50+	R			Water used for drilling, SPT refusal on gravelly material
15			**SILTY CLAY** (15.24 to 16.76) Some sand, fine to coarse grained, subangular to subrounded; some gravel, fine to coarse grained, subangular to subrounded; well graded, medium to high plasticity, greyish brown, compact to dense, stiff fines, moist to wet.		SPT #9	100		15/21/33	54			Water used for drilling
					SPT #10	61		23/22/41	63			Water used for drilling
	1005.0		**CLAYEY SAND** (16.76 to 18.29) Fine to coarse grained, subangular to subrounded; some gravel, fine to coarse grained, subangular to subrounded; some silt, well graded, medium plasticity, greyish brown, loose, compact to dense, moist to wet.		SPT #11	100		14/20/40	60			Water used for drilling
20					SPT #12	100		15/30/44	74			
			SILTY CLAY (18.29 to 19.81) Fine to coarse grained, subangular to subrounded; some gravel, fine to coarse grained, subangular to angular; some clay; some silt; well graded, high plasticity, greyish brown to grey, multicoloured sand and gravel particles, loose to compact, stiff fines, moist to wet.		SPT #13	100		14/23/29	52			Water used for drilling
	1000.0				SPT #14	100		14/18/23	41			Water used for drilling
			SAND AND GRAVEL		SPT #15	100		15/37/50+	R			Water used for drilling, SPT

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-25

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project
Contractor: Geotech Drilling Services Ltd.
Location: South Embankment
Coordinates: 683,398 E , 5,605,994 N
Coordinate System: UTM NAD83 Zone 10
Hole Size ODEX: 0 - 38.10 m, HQ3: 38.10 - 56.30 m

Drillhole No.: DH14-025
Drill Type: Fraste DR238
Total Depth: 56.30 m
Elevation: 1023.6 m
Azimuth , Inclination: 0 , -90

Page: 2 of 3
Date Started: 18 Aug 14
Date Completed: 22 Aug 14
Logged by: JBC
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
			(19.81 to 21.33) Fine to coarse grained, subangular to subrounded; some gravel, fine to coarse grained, subangular to angular; some clay; some silt, well graded, high plasticity, greyish brown to grey, multicoloured sand and gravel particles, loose to compact, stiff fines, moist to wet.		SPT #16	100		17/34/50+	R			refusal on very dense clayey material Water used for drilling, SPT refusal on very dense clayey material
			CLAYEY SAND AND GRAVEL (21.33 to 27.43) Fine to coarse grained, subangular to angular; and gravel, fine to coarse grained, subangular to angular; some silt; well graded, medium to high plasticity, greyish brown, multicolored sand and gravel particles, loose to compact, stiff fines, moist to wet.		SPT #17	100		15/29/47	76			Water used for drilling, SPT refusal on very dense clayey material
30	995.0				SPT #18	95		19/32/37	69			Water used for drilling, SPT refusal on very dense clayey material
					SPT #19	100		44/50+	R			Water used for drilling, SPT refusal on weathered bedrock
			SAND AND GRAVEL (27.43 to 28.95) Fine to coarse grained, subangular to subrounded; and gravel, fine to coarse grained, subangular to angular; some clay; some silt; well graded, medium to high plasticity, greyish brown to grey, multicolored sand and gravel particles, loose to compact, stiff fines, moist to wet.		SPT #20	100		50+	R			Water used for drilling, SPT refusal on weathered bedrock
	990.0				SPT #21	100		50+	R			Water used for drilling, SPT refusal on weathered bedrock
35			**WEATHERED BEDROCK** (28.95 to 38.1) Grey to dark grey angular fragments (sand and gravel sized), some calcite and quartz fragments. Core was lost during ODEX drilling.									
	985.0		**MAFIC VOLCANICS** (38.1 to 40.53) Grey to light grey, fine to medium grained, equigranular, medium strong, highly fractured, foliation in fragments, some calcite veinlets, moderately weathered.	63				R2				
40				95				R2				
			MAFIC VOLCANICS (40.53 to 44) Grey to light grey, fine to medium grained, equigranular, moderately to strongly foliated, medium strong to strong rock with some disseminated pyrite throughout, slightly weathered. Several shear zones over interval marked by strong foliation, weak rock with clay gouge. Calcite present as veins, veinlets and infilling along joints.	71				R2				
	980.0			95				R3				43.76 - 56.28 m - Lugeon Packer Test #1 - no take 43.76 - 56.28 m - Falling Head Packer Test #1 - K = 7E-08 m/s
45			**MAFIC VOLCANICS** (44 to 47.58) Light to medium grey, fine to medium grained, black phenocrysts, strong to medium strong, slightly weathered, disseminated pyrite throughout, highly fractured, minor shearing at ~45.0 m - 30 cm clay gouge.	67				R2				
				60				R2				
			MAFIC VOLCANICS (47.58 to 48.78) Grey to light grey, fine to medium grained, highly fractured, soft, seams of clay gouge - shear zone.	97				R2				
	975.0			43				R1				

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-25

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project
Contractor: Geotech Drilling Services Ltd.
Location: South Embankment
Coordinates: 683,398 E , 5,605,994 N
Coordinate System: UTM NAD83 Zone 10
Hole Size ODEX: 0 - 38.10 m, HQ3: 38.10 - 56.30 m

Drillhole No.: DH14-025
Drill Type: Fraste DR238
Total Depth: 56.30 m
Elevation: 1023.6 m
Azimuth , Inclination: 0 , -90

Page: 3 of 3
Date Started: 18 Aug 14
Date Completed: 22 Aug 14
Logged by: JBC
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
55	970.0		**MAFIC VOLCANICS** (48.78 to 52.18) Light to medium grey, , highly fractured, angular to subangular fragments, weak rock mixed with clay gouge due to shearing - low recovery.	37				R2				
			MAFIC VOLCANICS (52.18 to 56.28) Light to medium grey, fine to medium grained, strong foliation, highly fractured / altered, interval consists mainly of clay gouge with some angular rock fragments. Highly sheared or faulted zone.	67				R2				
				67				R2				
				73				R1				
60	965.0		End of Drillhole: 56.3 m Reached Target Depth									
65	960.0											
70	955.0											
	950.0											

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-25

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project
Contractor: Geotech Drilling Services Ltd.
Location: Cicada Study - SMSRF
Coordinates: 685,663 E , 5,607,580 N
Coordinate System: UTM NAD83 Zone 10
Hole Size ODEX: 0 - 23.84 m, HQ3: 23.84 - 102.40 m

Drillhole No.: DH14-026
Drill Type: Fraste DR238
Total Depth: 102.40 m
Elevation: 1042.9 m
Azimuth , Inclination: 0 , -90

Page: 1 of 5
Date Started: 18 Aug 14
Date Completed: 23 Aug 14
Logged by: MEA/WBG/GH
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
			SILTY GRAVELLY SAND (0 to 4.1) Fine; gravel, fine to medium, subrounded to angular; silt, no plasticity; well-graded, light grey to light brown, very dense, dry.		SPT #1	62		13/49/32	81			
	1040.0				SPT #2	97		20/35/33	68			
5			**GRAVELLY SANDY SILT** (4.1 to 5.6) No to low plasticity; sand, fine to coarse; gravel, fine to coarse, subrounded to subangular; well-graded, light grey to greyish brown; very dense, dry.		SPT #3	85		26/34/37	71			
					SPT #4	79		32/41/48	R			
			SILTY GRAVEL (5.6 to 13.2) Fine to coarse, subrounded to subangular; silt, low to no plasticity; some sand, fine to coarse; well graded, brownish grey, very dense; dry to moist.		SPT #5	74		20/16/50+	R			SPT refusal on coarse material
	1035.0				SPT #6	90		24/30/26	56			
10					SPT #7	0		50+	R			SPT refusal on coarse material
					SPT #8	79		23/49/40	R			SPT refusal on coarse material
	1030.0				SPT #9	88		19/44/50+	R			SPT refusal on coarse material
			GRAVELLY SAND (13.2 to 14.7) Fine to coarse; gravel, fine to medium, subrounded to subangular; some silt, no plasticity; well graded, dense, greyish brown, moist.		SPT #10	100		7/7/13	20			
15			**SILT** (14.7 to 22.3) Medium to high plasticity; trace gravel, fine to coarse, subangular to rounded; trace sand, fine to coarse; uniformly graded, very stiff, dark grey, moist.		SPT #11	62		12/14/18	32			
	1025.0				SPT #12	100		6/15/11	26			
					SPT #13	100		8/8/11	19			
20					SPT #14	100		9/16/21	37			
	1020.0				SPT #15	0		50+	R			SPT refusal on bedrock
				94				R4				

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-26

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project
Contractor: Geotech Drilling Services Ltd.
Location: Cicada Study - SMSRF
Coordinates: 685,663 E , 5,607,580 N
Coordinate System: UTM NAD83 Zone 10
Hole Size ODEX: 0 - 23.84 m, HQ3: 23.84 - 102.40 m

Drillhole No.: DH14-026
Drill Type: Fraste DR238
Total Depth: 102.40 m
Elevation: 1042.9 m
Azimuth , Inclination: 0 , -90

Page: 2 of 5
Date Started: 18 Aug 14
Date Completed: 23 Aug 14
Logged by: MEA/WBG/GH
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
			VOLCANICLASTIC (22.3 to 61.7) Light to dark green, fine to medium grained, massive, fresh to moderately weathered, trace irregular calcite veins occassionally with edipote or hematite, moderate to strong epidote and chlorite pervasive alteration, some local fracture oxidation.	99				R3				
				100				R4				
	1015.0			100				R4				
30				77				R4				
				97				R4				
	1010.0			100	UCS#1			R4				
				100				R5				
35				100				R5				
				100				R5				
	1005.0			100				R5				
			(38.4 to 38.6) Short shear zone within volcaniclastic unit.	100				R5				
40				100				R5				
				100				R5				
	1000.0			100				R5				
45				100				R5				
				100	UCS#2			R5				
	995.0			100				R5				
				100				R5				

25.69 - 40.84 m - Lugeon Packer Test #1 - K = 1E-08 m/s

40.69 - 55.85 m - Lugeon Packer Test #2 - K = <1E-08 m/s

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-26

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

PAGE B-989

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
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Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Cicada Study - SMSRF

Coordinates: 685,663 E , 5,607,580 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 23.84 m, HQ3: 23.84 - 102.40 m

Drillhole No.: DH14-026

Drill Type: Fraste DR238

Total Depth: 102.40 m

Elevation: 1042.9 m

Azimuth , Inclination: 0 , -90

Page: 3 of 5

Date Started: 18 Aug 14

Date Completed: 23 Aug 14

Logged by: MEA/WBG/GH

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
55	990.0		**VOLCANICLASTIC** (22.3 to 61.7) Light to dark green, fine to medium grained, massive, fresh to moderately weathered, trace irregular calcite veins occassionally with edipote or hematite, moderate to strong epidote and chlorite pervasive alteration, some local fracture oxidation.	100				R5				
				100				R5				
				100				R5				
				100				R5				
				99				R5				55.69 - 70.85 m - Lugeon Packer Test #3 - K = <1E-08 m/s
60	985.0		**FAULT ZONE** (57.4 to 61.7) Rubbly fault zone with some gouge on subangular gravelly clasts within unit.	100				R4				
				100				R4				
				73				R4				
				100				R4				
				70				R3				
65	980.0		**VOLCANICLASTIC** (61.7 to 102.4) Light to dark green, fine to medium grained, massive, fresh to moderately weathered, trace irregular calcite veins occassionally with edipote or hematite, moderate to strong epidote and chlorite pervasive alteration, some local fracture oxidation.	91				R4				
				100				R4				
				100				R5				
				93				R5				
70	975.0			27				R5				
				75				R4				
				98				R5				
				78				R5				70.68 - 85.86 m - Lugeon Packer Test #4 - K = <1E-08 m/s
	970.0			100				R5				
				83				R5				

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-26

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
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Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Cicada Study - SMSRF

Coordinates: 685,663 E , 5,607,580 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 23.84 m, HQ3: 23.84 - 102.40 m

Drillhole No.: DH14-026

Drill Type: Fraste DR238

Total Depth: 102.40 m

Elevation: 1042.9 m

Azimuth , Inclination: 0 , -90

Page: 4 of 5

Date Started: 18 Aug 14

Date Completed: 23 Aug 14

Logged by: MEA/WBG/GH

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - × (20 40 60 80)	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
80	965.0		**VOLCANICLASTIC** (61.7 to 102.4) Light to dark green, fine to medium grained, massive, fresh to moderately weathered, trace irregular calcite veins occassionally with edipote or hematite, moderate to strong epidote and chlorite pervasive alteration, some local fracture oxidation.	100				R5				
				100				R5				
				100				R5				
				100				R5				
				100				R5				80.83 - 102.35 m - Lugeon Packer Test #5 - K = <1E-08 m/s
85	960.0			69				R5				
			(84.35 to 90.35) Highly broken and fractured interval within volcaniclastic unit.	82				R0				
				69				R0				
	955.0			100				R0				
90				83				R0				
				97				R0				
				100				R0				
	950.0			100				R0				
95				100				R5				
				100				R5				
				100	UCS#3			R5				
	945.0			97				R5				

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-26

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project
Contractor: Geotech Drilling Services Ltd.
Location: Cicada Study - SMSRF
Coordinates: 685,663 E , 5,607,580 N
Coordinate System: UTM NAD83 Zone 10
Hole Size ODEX: 0 - 23.84 m, HQ3: 23.84 - 102.40 m

Drillhole No.: DH14-026
Drill Type: Fraste DR238
Total Depth: 102.40 m
Elevation: 1042.9 m
Azimuth , Inclination: 0 , -90

Page: 5 of 5
Date Started: 18 Aug 14
Date Completed: 23 Aug 14
Logged by: MEA/WBG/GH
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - × (20 40 60 80)	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
				100				R5				
				100				R5				
105	940.0		End of Drillhole: 102.4 m Reached Target Depth									
110	935.0											
115	930.0											
120	925.0											
	920.0											

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-26

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: TSF Basin

Coordinates: 683,453 E , 5,606,495 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 18.29 m, HQ3: 18.29 - 45.57 m

Drillhole No.: DH14-027

Drill Type: Fraste DR238

Total Depth: 45.57 m

Elevation: 1007.8 m

Azimuth , Inclination: 20 , -65

Page: 1 of 2

Date Started: 22 Aug 14

Date Completed: 25 Aug 14

Logged by: JBC

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
0	1005.0	**SILT** (0 to 4.57) Some fine to coarse grained, subangular to angular gravel, trace fine to coarse grained sand, trace clay, well graded, non plastic to low plasticity, brown to dark brown, loose to compact, dry.		SPT #1	100						No water used for drilling
				SPT #2	100						No water used for drilling
5		**GRAVELLY CLAY** (4.57 to 9.14) Fine to coarse grained, angular to subangular gravel, some silt, trace fine to coarse grained sand, poorly graded, medium plasticity, brown, multicoloured sand and gravel particles, loose to firm, moist.		SPT #3	70						No water used for drilling
				SPT #4	100						No water used for drilling
				SPT #5	100						No water used for drilling
	1000.0										
10		**SAND AND GRAVEL** (9.14 to 12.5) Fine to coarse grained sand, fine to coarse grained, subangular to angular gravel, some silt, trace clay, well graded, medium plasticity, brown to greyish brown, mainly dark grey sand and gravel particles, loose, wet.		SPT #6	0						Water used for drilling, SPT refusal on very dense material
				SPT #7	100						Water used for drilling
				SPT #8	100						Water used for drilling, SPT refusal on weathered bedrock
		WEATHERED BEDROCK (12.5 to 18.29) Grey to dark grey angular fragments (sand and gravel sized), some calcite and quartz fragments, dense, completely weathered.		SPT #9	100						Water used for drilling, SPT refusal on weathered bedrock
	995.0										
15				SPT #10	100						Water used for drilling, SPT refusal on weathered bedrock
				SPT #11	0						Water used for drilling, SPT refusal on weathered bedrock
		MAFIC VOLCANICS (18.29 to 23.07) Grey to bluish grey, fine to medium grained, equigranular, medium strong, moderately weathered, foliated, clay, calcite veinlets and rubble zones throughout rock mass.	90				R3				
	990.0										
20			100				R3				
			98				R3				21.35 - 33.57 m. Lugeon Packer Test #1 = 1 x 10-8 m/s
			90				R1				

GENERAL REMARKS:

SPTs collected for material characterization only, SPT blow counts are not applicable because the drillhole is inclined.

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-27

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: TSF Basin

Coordinates: 683,453 E , 5,606,495 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 18.29 m, HQ3: 18.29 - 45.57 m

Drillhole No.: DH14-027

Drill Type: Fraste DR238

Total Depth: 45.57 m

Elevation: 1007.8 m

Azimuth , Inclination: 20 , -65

Page: 2 of 2

Date Started: 22 Aug 14

Date Completed: 25 Aug 14

Logged by: JBC

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
	985.0		**RUBBLE ZONE** (23.07 to 29.07) Grey to pale grey, fine to medium grained, equigranular, weak, foliated, rubble zone, clay and pyrite on joint faces.	63				R2				
				57				R2				
				73				R2				
30	980.0		**MAFIC VOLCANICS** (29.07 to 45.57) Grey to light grey, fine to medium grained, equigranular, medium strong, slightly weathered, foliated, calcite veinlets throughout rock mass, clay and calcite infilling.	100	TRI#1 UCS#1			R3				
				98				R3				
				98				R3				
35	975.0			97				R3				33.35 - 45.57 m. Lugeon Packer Test #2 = 6 x 10-8 m/s
				100				R3				
				100				R3				
				100				R3				
40				97				R3				
	970.0			100				R4				
				100	UCS#2			R4				
45				100				R4				
			End of Drillhole: 45.57 m Reached Target Depth									
	965.0											

GENERAL REMARKS:

SPTs collected for material characterization only, SPT blow counts are not applicable because the drillhole is inclined.

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-27

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project
Contractor: Geotech Drilling Services Ltd.
Location: North Embankment
Coordinates: 682,302 E , 5,607,587 N
Coordinate System: UTM NAD83 Zone 10
Hole Size ODEX: 0 - 19.51 m, HQ3: 19.51 - 58.45 m

Drillhole No.: DH14-028
Drill Type: Fraste DR238
Total Depth: 58.45 m
Elevation: 945.8 m
Azimuth , Inclination: 0 , -90

Page: 1 of 3
Date Started: 23 Aug 14
Date Completed: 28 Aug 14
Logged by: AL
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
0	945.0	**GRAVELLY SILT** (0 to 4.2) Some sand and fine to coarse grained, subrounded to subangular, gap graded, medium to high plasticity, brown, stiff, massive, moist.		SPT #1	97		25/27/24	51			
				SPT #2	74		23/21/21	42			
5	940.0	**SILTY SAND** (4.2 to 8.8) Trace sand and gravel, subrounded, fine to coarse, uniformly graded, brown dense, moist.		SPT #3	43		14/26/41	67			
				SPT #4	100		20/39/50+	R			SPT refusal on dense material
				SPT #5	0		50+	R			SPT refusal on coarse material
10	935.0	**SILTY SAND AND GRAVEL** (8.8 to 16.4) Fine to coarse, subangular to subrounded, well graded, medium plasticity, very stiff, dark greenish grey, moist		SPT #6	100		27/40/50+	R			
				SPT #7	100		50+	R			SPT refusal on dense material
				SPT #8	0		50+	R			SPT refusal on coarse material
				SPT #9	0		50+	R			SPT refusal on coarse material
15	930.0			SPT #10	0		50+	R			SPT refusal on coarse material
		WEATHERED BEDROCK (16.4 to 16.76) Orangey brown bedrock chips from ODEX, oxidized, heavily weathered with trace silt present.		SPT #11	0		50+	R			SPT refusal on bedrock
		VOLCANICLASTIC (16.76 to 28.6) Fine to medium grained, inequigranular, purple to grey, medium strong, trace FeO staining and calcite infilling along joints, slightly altered and slightly weathered.	0				R0				
20	925.0		30				R3				
			83				R3				
			99				R3				
			52				R3				

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-28

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: North Embankment

Coordinates: 682,302 E , 5,607,587 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 19.51 m, HQ3: 19.51 - 58.45 m

Drillhole No.: DH14-028

Drill Type: Fraste DR238

Total Depth: 58.45 m

Elevation: 945.8 m

Azimuth , Inclination: 0 , -90

Page: 2 of 3

Date Started: 23 Aug 14

Date Completed: 28 Aug 14

Logged by: AL

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
	920.0		**VOLCANICLASTIC** (16.76 to 28.6) Fine to medium grained, inequigranular, purple to grey, medium strong, trace FeO staining and calcite infilling along joints, slightly altered and slightly weathered.	64				R3				
				100				R4				
			MONZONITE (28.6 to 34.1) Coarse grained, medium grey, medium strong, a few quartz veins, moderately weathered, rough to planar, soft clay infill (< 5 mm).	99				R3				
30				100				R3				
	915.0			99				R3				
				100				R3				
			VOLCANICLASTIC (34.1 to 37.1) Coarse grained, medium purple grey, weak, a few quartz veins, highly weathered, rough to planar, lots of healed fractures and rubble zone, soft clay infill (< 2 mm).	92				R2				
35	910.0			88				R2				
			VOLCANICLASTIC (37.1 to 58.45) Fine to medium grained, inequigranular, strong, dark greenish grey, trace FeO staining and calcite infilling along joints, slightly weathered.	100				R4				
				101				R4				
40	905.0			99				R4				
				99				R4				
				97				R4				
45				102				R4				
	900.0			102				R4				
				100				R4				

27.74 - 34.06 m - Lugeon Packer Test #1 - no take

33.83 - 40.16 m - Lugeon Packer Test #2 - no take

39.93 - 46.25 m - Lugeon Packer Test #3 - K = <1E-08 m/s

46.02 - 52.35 m - Lugeon Packer Test #4 - no take

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-28

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: North Embankment

Coordinates: 682,302 E , 5,607,587 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 19.51 m, HQ3: 19.51 - 58.45 m

Drillhole No.: DH14-028

Drill Type: Fraste DR238

Total Depth: 58.45 m

Elevation: 945.8 m

Azimuth , Inclination: 0 , -90

Page: 3 of 3

Date Started: 23 Aug 14

Date Completed: 28 Aug 14

Logged by: AL

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - × (20 40 60 80)	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
55	895.0		**VOLCANICLASTIC** (37.1 to 58.45) Fine to medium grained, inequigranular, strong, dark greenish grey, trace FeO staining and calcite infilling along joints, slightly weathered.	100				R4				
				99				R4				52.12 - 58.44 m - Lugeon Packer Test #5 - K = <1E-08 m/s
				102				R4				
				97				R4				
	890.0			89				R4				
				101				R3				
60	885.0		End of Drillhole: 58.45 m Reached Target Depth									
65	880.0											
70	875.0											

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-28

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: TSF Basin

Coordinates: 683,081 E , 5,607,665 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 22.86 m, HQ3: 22.86 - 51.90 m

Drillhole No.: DH14-029

Drill Type: Fraste DR238

Total Depth: 51.90 m

Elevation: 945.3 m

Azimuth , Inclination: 0 , -90

Page: 1 of 3

Date Started: 25 Aug 14

Date Completed: 29 Aug 14

Logged by: GNH

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
	945.0		**SILTY SAND** (0 to 5.58) Fine to medium grained, some angular to subangular gravel, brown to medium brown, medium to high plasticity, loose, well graded, moist.		SPT #1	75		16/26/45	71			SPT refusal on coarse material
					SPT #2	95		25/39/50+	R			SPT refusal on coarse material
					SPT #3	100		17/21/48	69			SPT refusal on coarse material
5	940.0		**GRAVELLY SILT** (5.58 to 20.78) Fine to coarse, angular to subangular gravel, some clay, greyish brown, high plasticity, well graded, moist to wet.		SPT #4	100		15/26/19	45			Start injecting water for drilling
					SPT #5	100		11/14/17	31			
					SPT #6	100		13/12/15	27			
10	935.0				SPT #7	25		9/13/16	29			
					SPT #8	92		10/15/20	35			
					SPT #9	100		6/10/12	22			
15	930.0				SPT #10	85		10/12/17	29			
					SPT #11	8		9/12/12	24			
					SPT #12	100		50+	R			SPT refusal on dense material
20	925.0				SPT #13	0		50+	R			SPT refusal on coarse material
			MAFIC VOLCANIC (20.78 to 26.5) Grey to greenish grey, medium to coarse grained, massive, medium strong, slightly weathered, iron oxide staining on joint surfaces, brecciated zones.		SPT #14	50		50+	R			SPT refusal on coarse material
					SPT #15	0		50+	R			SPT refusal on bedrock
				78				R4				
				93				R3				

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-29

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project
Contractor: Geotech Drilling Services Ltd.
Location: TSF Basin
Coordinates: 683,081 E , 5,607,665 N
Coordinate System: UTM NAD83 Zone 10
Hole Size ODEX: 0 - 22.86 m, HQ3: 22.86 - 51.90 m

Drillhole No.: DH14-029
Drill Type: Fraste DR238
Total Depth: 51.90 m
Elevation: 945.3 m
Azimuth , Inclination: 0 , -90

Page: 2 of 3
Date Started: 25 Aug 14
Date Completed: 29 Aug 14
Logged by: GNH
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE
	920.0	**QUARTZ FELDSPAR PORPHYRY** (25.3 to 26.5) Shear Zone within unit, some clay within fracture matrix.	91				R4	
		MAFIC VOLCANICS (26.5 to 29.8) Grey, fine grained, aphanitic, massive to weakly foliated, strong, slightly weathered, calcite veinlets throughout.	87				R4	
			100				R4	
30			100	UCS#1			R4	
	915.0	**SHEAR ZONE** (29.8 to 30.27) Sheared within unit, some clay within fracture matrix.						
		MAFIC VOLCANICS (30.27 to 34.1) Grey, fine grained, aphanitic, equigranular, massive, strong, carbonate blebs.	100				R5	
			100				R5	
35			100				R2	
	910.0	**FAULT ZONE** (34.1 to 38.6) Gouge Filled Zone within unit.	95				R2	
			100				R2	
		MUDSTONE (38.6 to 44.1) Dark grey, fined grained, massive, medium strong, highly weathered, carbonate blebs.	48				R3	
40			100				R2	
	905.0		100				R3	
			100				R4	
			84				R1	
		MAFIC VOLCANICS (44.1 to 47.85) Greenish grey, fine grained, massive, very weak, highly weathered, clay rich rock mass.	97				R1	
45	900.0	**FAULT ZONE** (45 to 47.85) Gouge Filled Zone within unit.	100				R1	
		QUARTZ FELDSPAR PORPHYRY (47.85 to 48.5) Pink and grey, fine to medium grained, strong.	100				R4	
			100				R4	

SPT TEST 'N' VALUES - 20 40 60 80

INSTRUMENTATION / WELL DETAILS

DRILLING NOTES

30.57 - 39.90 m. Lugeon Packer Test #1 = 3 x 10-7 m/s

42.57 - 51.90 m. Lugeon Packer Test #2 = 3 x 10-8 m/s

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-29

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: TSF Basin

Coordinates: 683,081 E , 5,607,665 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 22.86 m, HQ3: 22.86 - 51.90 m

Drillhole No.: DH14-029

Drill Type: Fraste DR238

Total Depth: 51.90 m

Elevation: 945.3 m

Azimuth , Inclination: 0 , -90

Page: 3 of 3

Date Started: 25 Aug 14

Date Completed: 29 Aug 14

Logged by: GNH

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - × (20 40 60 80)	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
	895.0		**MUDSTONE** (48.5 to 51.45) Dark grey, fine grained, massive, strong, blebs of carbonate, soft clay infilling.	100	UCS#2 TRI#1			R5				
			MAFIC VOLCANICS (51.45 to 51.9) Greenish grey, fine grained, massive, medium strong, slightly weathered, calcite veinlets throughout.									
			End of Drillhole: 51.9 m Reached Target Depth									
55	890.0											
60	885.0											
65	880.0											
70	875.0											

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-29

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: TSF Basin

Coordinates: 683,519 E , 5,606,613 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 28.95 m, HQ3: 28.95 - 60.37 m

Drillhole No.: DH14-030

Drill Type: Fraste DR238

Total Depth: 60.37 m

Elevation: 990.2 m

Azimuth , Inclination: 195 , -65

Page: 1 of 3

Date Started: 25 Aug 14

Date Completed: 29 Aug 14

Logged by: JBC/MAS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
0	990.0		**SANDY SILT** (0 to 12.19) Fine to coarse grained, some fine to coarse grained, subangular to subrounded gravel, trace clay, well graded, low to medium plasticity, brown to greyish brown, loose, moist.		SPT #1	100						No water used for drilling
					SPT #2	100						No water used for drilling
5	985.0				SPT #3	100						Water used for drilling, refusal on gravelly material
					SPT #4	100						No water used for drilling, refusal on gravelly material
					SPT #5	100						No water used for drilling, refusal on gravelly material
10	980.0				SPT #6	100						No Water used for drilling, refusal on very dense material
					SPT #7	100						Water used for drilling, refusal on very dense material
			SAND (12.19 to 24.38) Fine to coarse grained, some fine to medium grained, subangular to subrounded gravel, trace silt, trace clay, poorly graded, non-plastic, greyish brown, multicolored sand and gravel particles, loose, wet.		SPT #8	100						Water used for drilling, refusal on very dense material
					SPT #9	95						Water used for drilling, refusal on very dense material
15					SPT #10	100						No Water used for drilling, refusal on very dense material
	975.0				SPT #11	100						Water used for drilling, refusal on very dense material
					SPT #12	100						Water used for drilling, refusal on very dense material
20					SPT #13	100						Water used for drilling, refusal on very dense material
					SPT #14	100						Water used for drilling, refusal on very dense material
	970.0				SPT #15	100						Water used for drilling, refusal on very dense material
					SPT #16	100						Water used for drilling,

GENERAL REMARKS:

SPTs collected for material characterization only, SPT blow counts are not applicable because the drillhole is inclined.

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-30

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: TSF Basin

Coordinates: 683,519 E , 5,606,613 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 28.95 m, HQ3: 28.95 - 60.37 m

Drillhole No.: DH14-030

Drill Type: Fraste DR238

Total Depth: 60.37 m

Elevation: 990.2 m

Azimuth , Inclination: 195 , -65

Page: 2 of 3

Date Started: 25 Aug 14

Date Completed: 29 Aug 14

Logged by: JBC/MAS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
			SAND AND GRAVEL (24.38 to 28.6) Fine to coarse grained sand, fine to medium grained, subangular to angular gravel, some silt, some clay, well graded, medium to high plasticity, greyish brown to brown fines, multicolored sand and gravel particles, loose, wet.		SPT #17	100						refusal on very dense material Water used for drilling, refusal on very dense clayey material
	965.0		**SAND AND SILT** (28.6 to 35.85) Fine to coarse grained, well graded, medium plasticity, grey with angular to subangular grey clasts, compact to dense.									No SPTs performed due to hard material - assumed to be bedrock
30												
	960.0											
35			**MAFIC VOLCANICS** (35.85 to 39.37) Dark grey, fine to coarse grained, inequigranular, weak, highly weathered, foliated, broken zone, calcite chlorite and clay infill, clay zones soft.	96				R2				
				85				R2				
	955.0			67				R2				
40			**FAULT ZONE** (39.37 to 40.87) Coarse grained sand and gouge, clay zones soft.	60				R0				
			MAFIC VOLCANICS (40.87 to 42.37) Dark grey, fine to coarse grained, inequigranular, medium strong, moderately weathered, foliated, calcite and clay infill, calcite veinlets throughout rock mass.	100				R3				42.15 - 60.37 m. Lugeon Test #1 = 1 x 10-8 m/s
				92				R3				
	950.0		**MAFIC VOLCANICS** (42.37 to 46.87) Dark grey, fine to coarse grained, inequigranular, weak to medium strong, moderately weathered, foliated, broken zone, calcite and clay infill, calcite veinlets throughout rock mass, some clay zones.	97				R0				
45				100				R2				
			MAFIC VOLCANICS (46.87 to 54.37) Dark grey, fine to coarse grained, inequigranular, medium strong, moderately weathered, foliated, calcite, chlorite and clay infill, calcite veinlets throughout rock mass, minor clay zones.	101				R3				
				93				R3				

GENERAL REMARKS:

SPTs collected for material characterization only, SPT blow counts are not applicable because the drillhole is inclined.

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-30

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: TSF Basin

Coordinates: 683,519 E , 5,606,613 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 28.95 m, HQ3: 28.95 - 60.37 m

Drillhole No.: DH14-030

Drill Type: Fraste DR238

Total Depth: 60.37 m

Elevation: 990.2 m

Azimuth , Inclination: 195 , -65

Page: 3 of 3

Date Started: 25 Aug 14

Date Completed: 29 Aug 14

Logged by: JBC/MAS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - × (20 40 60 80)	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
			MAFIC VOLCANICS (46.87 to 54.37) Dark grey, fine to coarse grained, inequigranular, medium strong, moderately weathered, foliated, calcite, chlorite and clay infill, calcite veinlets throughout rock mass, minor clay zones.	97				R4				
				100				R4				
				97				R4				
55	940.0		**FAULT ZONE** (54.37 to 55.87) Clay gouge fault zone with broken zones of mafic volcanic rock.	67				R3				
			MAFIC VOLCANICS (55.87 to 60.37) Grey to dark grey, fine to coarse grained, inequigranular, medium strong, moderately weathered, foliated, calcite, chlorite and clay infill, calcite veinlets throughout rock mass, minor clay zones.	100				R3				
				100				R3				
60				98				R6				
	935.0		End of Drillhole: 60.37 m Reached Target Depth									
65												
	930.0											
70												
	925.0											

GENERAL REMARKS:

SPTs collected for material characterization only, SPT blow counts are not applicable because the drillhole is inclined.

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-30

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Downstream of North Embankment

Coordinates: 681,923 E , 5,607,844 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 15.85 m, HQ3: 15.85 - 53.35 m

Drillhole No.: DH14-031

Drill Type: Fraste DR238

Total Depth: 53.35 m

Elevation: 944.4 m

Azimuth , Inclination: 0 , -90

Page: 1 of 3

Date Started: 29 Aug 14

Date Completed: 2 Sep 14

Logged by: GNH/AL/MAS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
0		**SILTY SAND** (0 to 5.8) Angular to subangular, fine to coarse grained, some fine grained subangular to subrounded gravel, trace clay; poorly graded, low plasticity, brown to brownish grey, compact to dense, massive, moist to dry. [Glacial Till]		SPT #1	92		18/49/50+	R			SPT refusal on dense material
				SPT #2	100		10/15/18	33			
5	940.0			SPT #3	72		13/22/26	48			
		SILTY CLAY (5.8 to 8) Uniformly graded, high plasticity, brown, soft, massive, moist to wet.		SPT #4	100		12/12/10	22			Start injecting water for drilling
				SPT #5	100		2/3/4	7			
		SILTY SAND (8 to 11.89) Angular to subangular, fine to coarse grained, some fine grained subangular to subrounded gravel, trace clay; poorly graded, low plasticity, brown to brownish grey, compact to dense, massive, moist to dry.		SPT #6	96		30/50+	R			SPT refusal on dense material
10	935.0			SPT #7	100		40/50+	R			SPT refusal on dense material
		SILTY SAND (11.89 to 13.41) Angular to subangular, fine to coarse grained, some fine grained subangular to subrounded gravel, trace clay; poorly graded, low plasticity, brown to brownish grey, compact to dense, massive, moist to dry.		SPT #8	100		42/50+	R			SPT refusal on weathered bedrock
			51				R3				
15	930.0	**WEATHERED BEDROCK** (13.41 to 15.85) Greenish grey to red; fine to medium grained, porphyritic; broken zone; medium strong, calcite infill, some coarse grained sand and fine grained gravel throughout.	90				R3				
			82				R3				
		VOLCANICLASTIC (15.85 to 53.35) Greenish grey; fine to coarse grained, porphyritic, massive; moderately fractured; moderately weathered; medium strong, calcite infill, some rubble infill, calcite veins, some FeO staining, clay infill on one joint, quartz and calcite content increasing with depth.	83				R3				
20	925.0		100				R4				16.97 - 29.35 m - lugeon packer test #1 = no take
			98				R4				
			93	UCS#1			R4				
	920.0		100				R4				

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-31

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Downstream of North Embankment

Coordinates: 681,923 E , 5,607,844 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 15.85 m, HQ3: 15.85 - 53.35 m

Drillhole No.: DH14-031

Drill Type: Fraste DR238

Total Depth: 53.35 m

Elevation: 944.4 m

Azimuth , Inclination: 0 , -90

Page: 2 of 3

Date Started: 29 Aug 14

Date Completed: 2 Sep 14

Logged by: GNH/AL/MAS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - × (20 40 60 80)	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
30	915.0		**VOLCANICLASTIC** (15.85 to 53.35) Greenish grey; fine to coarse grained, porphyritic, massive; moderately fractured; moderately weathered; medium strong, calcite infill, some rubble infill, calcite veins, some FeO staining, clay infill on one joint, quartz and calcite content increasing with depth.	98				R4				
				97				R4				
				101				R4				
				102				R4				28.98 - 41.35 m - lugeon packer test #2 = no take
				99	TRI#1			R4				
				91				R4				
35	910.0			97				R4				
				100				R4				
				100				R5				
				101				R5				
40	905.0			100				R4				
				100				R4				40.97 - 53.35 m - lugeon packer test #3 = 5 x 10-8 m/s
				100	UCS#2			R4				
45	900.0			100				R5				
				100				R5				
				96	UCS#3			R5				
	895.0			102				R5				

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-31

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Downstream of North Embankment

Coordinates: 681,923 E , 5,607,844 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 15.85 m, HQ3: 15.85 - 53.35 m

Drillhole No.: DH14-031

Drill Type: Fraste DR238

Total Depth: 53.35 m

Elevation: 944.4 m

Azimuth , Inclination: 0 , -90

Page: 3 of 3

Date Started: 29 Aug 14

Date Completed: 2 Sep 14

Logged by: GNH/AL/MAS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
			VOLCANICLASTIC (15.85 to 53.35) Greenish grey; fine to coarse grained, porphyritic, massive; moderately fractured; moderately weathered; medium strong, calcite infill, some rubble infill, calcite veins, some FeO staining, clay infill on one joint, quartz and calcite content increasing with depth.	100				R4				
				100				R4				
			End of Drillhole: 53.35 m Reached Target Depth									
55	890.0											
60	885.0											
65	880.0											
70	875.0											
	870.0											

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-31

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project
Contractor: Geotech Drilling Services Ltd.
Location: TSF Basin
Coordinates: 683,290 E , 5,607,547 N
Coordinate System: UTM NAD83 Zone 10
Hole Size ODEX: 0 - 20.79 m, HQ3: 20.79 - 59.79 m

Drillhole No.: DH14-032
Drill Type: Fraste DR238
Total Depth: 59.79 m
Elevation: 945.2 m
Azimuth , Inclination: 0 , -90

Page: 1 of 3
Date Started: 29 Aug 14
Date Completed: 1 Sep 14
Logged by: GNH
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
0	945.0	**GRAVELLY SANDY SILT** (0 to 10.15) Fine to medium grained, subrounded to angular, well graded, non plastic to low plasticity, brown to greyish brown, compact to dense, moist.		SPT #1	74		10/16/38	54			Start injecting water for drilling
				SPT #2	46		8/12/24	36			
				SPT #3	100		50+	R			SPT refusal on coarse material
5	940.0			SPT #4	100		17/45/50+	R			SPT refusal on coarse material
				SPT #5	100		15/29/36	65			SPT refusal on coarse material
				SPT #6	100		18/26/39	65			SPT refusal on dense material
10	935.0	**GRAVELLY SILT** (10.15 to 13.8) Subangular to angular, some clay, poorly graded, medium plasticity, brown, dense, moist.		SPT #7	100		15/20/27	47			
				SPT #8	100		14/24/40	64			
				SPT #9	100		11/9/18	27			
		SILT (13.8 to 19.27) Some gravel, sand and clay, well graded, non plastic to low plasticity, greyish brown, compact, moist.		SPT #10	100		50+	R			SPT refusal on coarse material
15	930.0			SPT #11	84		16/28/26	54			
				SPT #12	100		8/8/13	21			
		WEATHERED BEDROCK (19.27 to 20.79) Decomposed bedrock.		SPT #13	100		50+	R			SPT refusal on coarse material
20	925.0	**QUARTZ FELDSPAR PORPHYRY** (20.79 to 37.52) Pinkish grey, medium grained, inequigranular, strong, slightly weathered, massive, calcite veinlets throughout rock mass.	100	SPT #14	0		50+ R4	R			SPT refusal on bedrock
			97				R4				
			100	UCS#1			R4				23.41 - 35.79 m. Lugeon Test #1 = 1 x 10-7 m/s.

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-32

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project
Contractor: Geotech Drilling Services Ltd.
Location: TSF Basin
Coordinates: 683,290 E , 5,607,547 N
Coordinate System: UTM NAD83 Zone 10
Hole Size ODEX: 0 - 20.79 m, HQ3: 20.79 - 59.79 m

Drillhole No.: DH14-032
Drill Type: Fraste DR238
Total Depth: 59.79 m
Elevation: 945.2 m
Azimuth , Inclination: 0 , -90

Page: 2 of 3
Date Started: 29 Aug 14
Date Completed: 1 Sep 14
Logged by: GNH
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - × (20 40 60 80)	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
	920.0		**QUARTZ FELDSPAR PORPHYRY** (20.79 to 37.52) Pinkish grey, medium grained, inequigranular, strong, slightly weathered, massive, calcite veinlets throughout rock mass.	100				R4				
				100				R4				
				100				R4				
30	915.0			100				R4				
				97				R4				
				99				R4				
35	910.0			100				R4				
				100	UCS#2			R4				35.41 - 47.79 m. Lugeon Test #2 = 6 x 10-8 m/s.
			SHEAR ZONE (37.52 to 37.75) Shear zone at contact between Quartz Feldspar Porphyry and Volcaniclastic units.	97				R4				
			VOLCANICLASTIC (37.75 to 40.29) Dark greenish grey, fine to medium grained, aphanitic, strong, massive, brecciated, quart and carbonate veinlets.	100				R4				
40	905.0			90				R1				
			FAULT ZONE (40.29 to 45) Fault zone in Volcaniclastic unit, highly weathered, clay rich.	100				R3				
				92				R1				
				89				R2				
45	900.0		**VOLCANICLASTIC** (45 to 59.79) Dark greenish grey, fine to medium grained, aphanitic, strong, massive, brecciated, quartz and carbonate veinlets.	100				R5				
				100				R5				
			SHEAR ZONE (47.32 to 50) Shear zone within unit.	100				R3				47.42 - 59.80 m. Lugeon Test #3 = 5 x 10-7 m/s.
				98				R4				

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-32

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: TSF Basin

Coordinates: 683,290 E , 5,607,547 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 20.79 m, HQ3: 20.79 - 59.79 m

Drillhole No.: DH14-032

Drill Type: Fraste DR238

Total Depth: 59.79 m

Elevation: 945.2 m

Azimuth , Inclination: 0 , -90

Page: 3 of 3

Date Started: 29 Aug 14

Date Completed: 1 Sep 14

Logged by: GNH

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
	895.0		**VOLCANICLASTIC** (45 to 59.79) Dark greenish grey, fine to medium grained, aphanitic, strong, massive, brecciated, quartz and carbonate veinlets.	101	TRI#1			R5				
				100				R5				
				97				R4				
			SHEAR ZONE (54.4 to 54.7) Shear zone within unit.	99	UCS#3			R4				
55	890.0			100				R4				
				100				R4				
				100	UCS#4			R4				
60	885.0		End of Drillhole: 59.79 m Reached Target Depth									
65	880.0											
70	875.0											

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-32

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project
Contractor: Geotech Drilling Services Ltd.
Location: TSF Basin
Coordinates: 683,438 E , 5,606,878 N
Coordinate System: UTM NAD83 Zone 10
Hole Size ODEX: 0 - 19.71 m, HQ3: 19.71 - 47.32 m

Drillhole No.: DH14-033
Drill Type: Fraste DR238
Total Depth: 47.32 m
Elevation: 961.5 m
Azimuth , Inclination: 0 , -90

Page: 1 of 2
Date Started: 29 Aug 14
Date Completed: 31 Aug 14
Logged by: JBC/MAS
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
	960.0		**SAND** (0 to 4.57) Fine grained, some fine to coarse grained, subangular to subrounded gravel, some silt, trace cobbles and boulders, poorly graded, non plastic, brown, massive, dry.		SPT #1	90		19/50+	R			No water used for drilling, SPT refusal on boulder
					SPT #2	100		15/21/44	R			No water used for drilling, SPT refusal on boulder/cobble
5			**GRAVEL AND SAND** (4.57 to 16.76) Fine grained, subangular to subrounded, some silt, trace clay, well graded, low plasticity, brown, loose, massive, moist.		SPT #3	100		14/44/50+	R			No water used for drilling, SPT refusal on boulder/gravel
	955.0				SPT #4	97		26/50+	R			No water used for drilling, SPT refusal on boulder/cobble
					SPT #5	100		16/19/31	R			Water used partly for drilling, SPT refusal on boulder/cobble
10					SPT #6	100		26/50+	R			No water used for drilling, SPT refusal on boulder/cobble
	950.0				SPT #7	100		28/45/50+	R			No water used for drilling, SPT refusal on boulder/cobble
					SPT #8	100		32/54/50+	R			No water used for drilling, SPT refusal on boulder/cobble
					SPT #9	100		22/20/25	45			Water used for drilling
15					SPT #10	100		21/28/28	56			Water used for drilling, SPT refusal on coarse/ dense material
	945.0		**WEATHERED BEDROCK** (16.76 to 19.71) Dark grey, graphite and clay altered, weathered bedrock with angular rock fragments.		SPT #11	100		24/46/50+	R			Water used for drilling, SPT refusal on coarse/ dense material
				34				R0				
				34				R0				
20			**SANDSTONE** (19.71 to 25.35) Dark to light grey, fine to coarse grained, inequigranular, medium strong, moderately weathered, brecciated, small rubble zones, calcite veinlets throughout rock mass.	66				R3				
	940.0			100				R3				
				91				R3				23.10 - 35.32 m. Lugeon Test #1 = 3 x 10-8 m/s.

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-33

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: TSF Basin

Coordinates: 683,438 E , 5,606,878 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 19.71 m, HQ3: 19.71 - 47.32 m

Drillhole No.: DH14-033

Drill Type: Fraste DR238

Total Depth: 47.32 m

Elevation: 961.5 m

Azimuth , Inclination: 0 , -90

Page: 2 of 2

Date Started: 29 Aug 14

Date Completed: 31 Aug 14

Logged by: JBC/MAS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
			QUARTZ FELDSPAR PORPHYRY (25.35 to 26.45) Pinkish grey, coarse grained, inequigranular, medium strong, unweathered, fresh, massive, some calcite veinlets throughout rock mass.	99	UCS#1			R4				
	935.0			100				R3				
			SANDSTONE (26.45 to 42.6) Greenish grey to light grey, fine to coarse grained, inequigranular, medium strong, slightly to moderately weathered, brecciated, small rubble zones, calcite veinlets throughout rock mass.	90				R3				
30				99				R3				
	930.0			97				R3				
				100				R2				
				100				R2				
35				100				R3				35.10 - 47.32 m. Lugeon Test #2 = 2 x 10-9 m/s.
	925.0			100				R3				
				100				R3				
				100				R3				
40				100				R3				
	920.0			98				R4				
			QUARTZ FELDSPAR PORPHYRY (42.6 to 45.05) Pale to orangey brown, coarse grained, strong, unweathered, fresh, massive, calcite veinlets throughout rock mass, soft calcite infill present.	100	UCS#2			R4				
45			**SANDSTONE** (45.05 to 47.32) Greenish grey to light grey, fine to coarse grained, inequigranular, medium strong, slightly to moderately weathered, brecciated, small rubble zones, calcite veinlets throughout rock mass.	95				R4				
	915.0			100				R4				
			End of Drillhole: 47.32 m Reached Target Depth									

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-33

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: South Embankment

Coordinates: 682,798 E , 5,606,032 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 10.67 m, HQ3: 10.67 - 42.91 m

Drillhole No.: DH14-034

Drill Type: Fraste DR238

Total Depth: 42.91 m

Elevation: 1024.9 m

Azimuth , Inclination: 0 , -90

Page: 1 of 2

Date Started: 31 Aug 14

Date Completed: 3 Sep 14

Logged by: JBC/MAS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	DRILLING NOTES
		CLAYEY SILT (0 to 1.52) Some gravel, fine to medium grained, subrounded to subangular, well graded; trace cobbles (as seen from the sump); silt is low to medium plasticity, brown, loose, dry to moist.		SPT #1	75		5/8/7	15		No water used for drilling
		SILTY CLAY (1.52 to 3.05) Trace gravel, fine grained, subrounded to subangular; trace sand, coarse grained, poorly graded; medium plasticity, brown, loose, moist.		SPT #2	100		3/4/18	22		No water used for drilling
5.0	1020.0	**CLAY** (3.05 to 6.1) Trace gravel, fine grained, subangular to angular; trace sand, fine to coarse grained, subrounded to subangular; gap graded, medium plasticity, brown to dark brown, dark grey gravel chips, loose, moist.		SPT #3	100		5/5/7	12		No water used for drilling, flushed hole after ODEX
				SPT #4	100		4/12/14	26		Water used for drilling
		SILTY SAND (6.1 to 7.62) Fine to coarse grained, subrounded to subangular; some gravel, fine grained, subangular to angular; trace clay (possibly washed away), well graded, medium to high plasticity, greyish brown, dark grey sand and gravel clasts, loose, wet.		SPT #5	100		36/50+	R		Water used for drilling, SPT refusal on weathered bedrock
10.0	1015.0	**WEATHERED BEDROCK** (7.62 to 10.67) Dark grey angular fragments (sand and gravel sized) Volcaniclastic	63				R0			
		VOLCANICLASTIC (10.67 to 23.9) Dark grey to greyish black, fine to coarse grained, inequigranular, weakly foliated, mostly competent with some calcite veinlets throughout. Joints infillled with FeO or clay. Rock is strong and mostly unweathered.	100				R2			
			89	UCS#1			R4			12.69 - 18.91 m - Lugeon Packer Test #1 - no take
			99				R4			
15.0	1010.0		100	UCS#2			R4			
			100				R5			
			100				R5			
			100				R5			18.69 - 24.91 m - Lugeon Packer Test #2 - K = 2E-08 m/s
20.0	1005.0		100				R5			
			99				R5			
			100				R3			23.19 - 30.91 m - Lugeon Packer Test #3 - K = 1E-08 m/s

GENERAL REMARKS:

No piezometer installation.

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-34

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL LOG - NO INSTALLATION, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: South Embankment

Coordinates: 682,798 E , 5,606,032 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 10.67 m, HQ3: 10.67 - 42.91 m

Drillhole No.: DH14-034

Drill Type: Fraste DR238

Total Depth: 42.91 m

Elevation: 1024.9 m

Azimuth , Inclination: 0 , -90

Page: 2 of 2

Date Started: 31 Aug 14

Date Completed: 3 Sep 14

Logged by: JBC/MAS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - × (20 40 60 80)	DRILLING NOTES
			VOLCANICLASTIC (23.9 to 32.95) Grey to dark greenish grey, fine to coarse grained, inequigranular, altered, moderately to heavily fractured - some subvertical fracturing, joints infilled with FeO and clay, weak foliation. Rock strength is weak to medium strong.	98				R3			
				100				R2			
				100				R4			
				95				R2			
30.0	995.0		**SHEAR ZONE** (28.85 to 32.95) Sheared zone.	97				R2			
				100				R2			30.69 - 36.91 m - Lugeon Packer Test #4 - no take
				100				R2			
			VOLCANICLASTIC (32.95 to 36.56) Dark grey to greenish grey, fine to coarse grained, competent, come calcite veins and veinlets, joint orientation ~45 degrees to core axis, infillled with calcite and/or chlorite, strong, moderately weathered to unweathered.	100				R5			
				100	UCS#3			R5			
35.0	990.0			98				R5			
			FAULT ZONE (36.56 to 42.91) Dark grey to greenish grey, fine to coarse grained, very weak, heavily fractured and highly altered faulted volcaniclastic material, abundant clay gouge and fractured rock. Calcite veins and veinlets throughout rock and along joints.	67				R2			36.69 - 42.91 m - Lugeon Packer Test #5 - no take
				87				R0			
40.0	985.0			100				R0			
				100				R0			
			End of Drillhole: 42.91 m Reached Target Depth								
45.0	980.0										

GENERAL REMARKS:

No piezometer installation.

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-34

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL LOG - NO INSTALLATION, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: South Embankment

Coordinates: 683,878 E , 5,605,627 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 6.10 m, HQ3: 6.10 - 37.00 m

Drillhole No.: DH14-035

Drill Type: Fraste DR238

Total Depth: 37.00 m

Elevation: 1058.3 m

Azimuth , Inclination: 0 , -90

Page: 1 of 2

Date Started: 3 Sep 14

Date Completed: 5 Sep 14

Logged by: JBC/MAS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
0		**SILT** (0 to 1.52) Trace gravel, fine grained, subangular to angular; trace sand, fine grained; trace clay, poorly graded, non plastic to low plasticity, brown to greyish brown, loose, dry to moist.		SPT #1	100		20/18/24	42			No water used for drilling
	1055.0	**SILT** (1.52 to 4.11) Some clay; trace gravel, fine grained, subangular to angular; trace sand, fine grained, well graded, low plasticity, brown, loose, moist.		SPT #2	100		14/11/15	26			No water used for drilling
5		**WEATHERED BEDROCK** (4.11 to 6.1) Grey to ash grey angular fragments (sand and gravel sized)		SPT #3	0		50+	R			No water used for drilling, SPT refusal on weathered bedrock
		SILTSTONE (6.1 to 10) Medium to dark greenish grey, foliated, fine to coarse grained, inequigranular, medium strength, moderately fractured with calcite, chlorite and FeO infilling. Trace calcite veins and veinlets and some quartz banding. Slightly weathered.	87				R4				
	1050.0		57				R4				7.68 - 25.00 m - Lugeon Packer Test #1 - K = 2E-07 m/s
			87				R4				8.28 - 13.00 m - Falling Head Packer Test #1 - K = 2E-07 m/s
10		**BROKEN ZONE** (10 to 13) Medium to dark greenish grey, foliated, fine to coarse grained, inequigranular, medium strength, highly fractured with horizontal and subvertical fracturing - trace clay infill, several small, rubbly zones over interval.	51				R3				
			75				R3				
	1045.0	**SILTSTONE** (13 to 17.9) Medium to dark grey, fine to coarse grained, foliated, medium strength, moderately fractured, no infill along joints, some calcite veinlets and quartz banding, disseminated fine to coarse grained sulphides throughout rock, strong, slightly weathered.	100	UCS#1			R4				
15			99				R4				14.28 - 19.00 m - Falling Head Packer Test #2 - K = 9E-07 m/s
			99				R5				
	1040.0	**BROKEN ZONE** (17.9 to 22) Medium to dark greenish grey, foliated, fine to coarse grained, inequigranular, medium strength, highly fractured with horizontal and subvertical fracturing - trace clay, calcite and FeO infill, several small, rubbly zones over interval. Disseminated sulphides throughout rock, quartz banding, moderately strong and moderately weathered.	73				R5				17.28 - 25.00 m - Falling Head Packer Test #3 - K = 1E-07 m/s
20			87				R3				
			98				R4				
			100				R5				
	1035.0		92				R4				23.28 - 31.00 m - Lugeon Packer Test #2 - K = 1E-06 m/s

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-35

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: South Embankment

Coordinates: 683,878 E , 5,605,627 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 6.10 m, HQ3: 6.10 - 37.00 m

Drillhole No.: DH14-035

Drill Type: Fraste DR238

Total Depth: 37.00 m

Elevation: 1058.3 m

Azimuth , Inclination: 0 , -90

Page: 2 of 2

Date Started: 3 Sep 14

Date Completed: 5 Sep 14

Logged by: JBC/MAS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
30	1030.0		**SILTSTONE** (22 to 37) Medium to dark grey, fine to medium grained, inequigranular, weak foliation, medium strength, moderately fractured with heavy fracturing over 23.5 to 24.5 m, FeO, calcite and trace clay infill along joints, some calcite veinlets and quartz banding, trace disseminated fine to coarse grained sulphides throughout rock, strong, slightly weathered.	100				R4				
				100	UCS#2			R4				
				99				R4				
				100				R4				
35	1025.0			100	UCS#3			R4				30.88 - 37.00 m - Lugeon Packer Test #3 - K = 3E-08 m/s
				97				R3				
				100				R4				
				98				R4				
40	1020.0		End of Drillhole: 37 m Reached Target Depth									
45	1015.0											
	1010.0											

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-35

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Southeast Embankment

Coordinates: 685,004 E , 5,605,147 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 59.43 m, HQ3: 59.43 - 74.43 m

Drillhole No.: DH14-036

Drill Type: Fraste DR238

Total Depth: 74.43 m

Elevation: 1049.5 m

Azimuth , Inclination: 0 , -90

Page: 1 of 3

Date Started: 4 Sep 14

Date Completed: 15 Sep 14

Logged by: GNH

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
			GRAVELLY SILT (0 to 2.56) Fine to medium grained, angular to subrounded; some sand, fine to medium grained; trace clay; well graded, low plasticity, greyish brown to brown, compact to dense, dry, some clasts up to 2 cm in diameter.		SPT #1	72		14/15/20	35			
					SPT #2	100		11/50+	R			SPT refusal on dense material
			SILTY CLAY (2.56 to 4.08) Very fine to fine grained, angular to subrounded; poorly graded, medium to high plasticity; brown to greyish brown, compact, dry, some gravel clasts up to 2 cm in diameter.		SPT #3	34		9/13/19	32			
5	1045.0		**SANDY SILT** (4.08 to 25.96) Fine to medium grained; trace gravel, fine to medium grained, angular to subrounded; trace clay; well graded, non-plastic, brown to greyish brown, compact to dense, dry to moist, some grave clasts up to 2 cm in diameter.		SPT #4	100		28/28/50	R			
					SPT #5	100		17/27/27	54			
					SPT #6	100		16/20/26	46			
10	1040.0				SPT #7	100		13/20/19	39			No SPT conducted at 12.28 m as casing had been advanced to 13.7 m.
					SPT #8	100		20/21/30	51			
15	1035.0				SPT #9	93		18/25/30	55			
					SPT #10	100		12/19/20	39			
					SPT #11	100		19/42/40	R			
20	1030.0				SPT #12	100		50+	R			SPT refusal on coarse material
					SPT #13	95		10/15/14	29			
					SPT #14	80		14/32/29	61			SPT refusal on coarse material
	1025.0				SPT #15	82		30/38/40	R			

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-36

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Southeast Embankment

Coordinates: 685,004 E , 5,605,147 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 59.43 m, HQ3: 59.43 - 74.43 m

Drillhole No.: DH14-036

Drill Type: Fraste DR238

Total Depth: 74.43 m

Elevation: 1049.5 m

Azimuth , Inclination: 0 , -90

Page: 2 of 3

Date Started: 4 Sep 14

Date Completed: 15 Sep 14

Logged by: GNH

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
30	1020.0		**SANDY GRAVEL** (25.96 to 35.05) Fine to medium grained, subangular to subrounded; some silt; well graded, non-plastic, brown, very dense, dry, some gravel clasts up to 2 cm in diameter.		SPT #16	100		50+	R			SPT refusal on coarse material
					SPT #17	69		50+	R			SPT refusal on coarse material
					SPT #18	69		50+	R			SPT refusal on coarse material
					SPT #19	100		50+	R			SPT refusal on coarse material
35	1015.0		**BOULDERS & GRAVEL** (35.05 to 39.62) Medium grained, some angular to subrounded; some cobbles, subangular to subrounded; poorly graded, non-plastic, grey and pink rock fragments, loose, wet, fines washed away.		SPT #20	0		50+	R			SPT refusal on coarse material Reduce to HQ, start drilling with water No SPT conducted at 36.58 m due to gravel and boulder material encountered during drilling.
40	1010.0		**GRAVEL** (39.62 to 48.76) Fine to medium grained, subangular to subrounded; some sand, fine to medium grained; poorly graded, non-plastic, multi-coloured rock fragments, loose, wet, fines washed away, some gravel clasts up to 2 cm in diameter.		SPT #21	34		22/25/50+	R			SPT refusal on coarse material
					SPT #22	0		50+	R			No SPTS conducted over 45.72 - 59.43 m interval due to gravel, cobble and boulder material encountered during drilling. SPT refusal on coarse material
45	1005.0											
	1000.0											

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-36

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Southeast Embankment

Coordinates: 685,004 E , 5,605,147 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 59.43 m, HQ3: 59.43 - 74.43 m

Drillhole No.: DH14-036

Drill Type: Fraste DR238

Total Depth: 74.43 m

Elevation: 1049.5 m

Azimuth , Inclination: 0 , -90

Page: 3 of 3

Date Started: 4 Sep 14

Date Completed: 15 Sep 14

Logged by: GNH

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
55	995.0		**BOULDER** (48.76 to 50.29) Large Boulder; uniformly graded, non-plastic, dark green, very dense, wet, fines washed away.									
			GRAVEL (50.29 to 59.43) Fine to medium grained, angular to subrounded; uniformly graded, non-plastic, green-grey-white & orange fragments, loose, wet, fines washed away, clasts up to 1 cm in diameter.									No SPTS conducted over 45.72 - 59.43 m interval due to gravel, cobble and boulder material encountered during drilling.
60	990.0		**VOLCANICLASTIC** (59.43 to 61.8) Dark greenish grey to grey; fine to medium grained, massive; slightly to moderately weathered; intensely fractured to broken; medium strong to strong, quartz-carbonate veining throughout, calcite coating on fracture surfaces, clay-like (gouge?) coating on some surfaces, signs of a felsic intrusion between 60.93 m and 63.93 m.	50				R4				
				100				R4				
				77				R3				62.27 m - 68.43 m - Falling Head Test #1 (Hvorslev Method) - K = 2E-07 m/s
65	985.0		**SHEAR ZONE** (61.8 to 67.85) MUDSTONE; light grey to grey, fine to medium grained, weakly foliated, weak, quartz and carbonate veining throughout, highly fractured with some gouge material.	60				R3				
				94				R3				
				100				R3				
70	980.0		**MUDSTONE** (67.85 to 74.43) Grey; fine to medium grained, massive; slightly to moderately weathered; intensely fractured to broken; medium strong to strong, quartz-carbonate veining and veinlets throughout, increasingly altered with depth with some clayey gouge infill on joints.	94				R4				68.27 m - 74.43 m - Falling Head Test #2 (Hvorslev Method) - K = 5E-09 m/s
				85				R4				
				90				R4				
	975.0			93				R4				
			End of Drillhole: 74.43 m Reached Target Depth									

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-36

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project
Contractor: Geotech Drilling Services Ltd.
Location: East Embankment
Coordinates: 685,156 E , 5,607,136 N
Coordinate System: UTM NAD83 Zone 10
Hole Size ODEX: 0 - 3.05 m, HQ3: 3.05 - 101.20 m

Drillhole No.: DH14-037
Drill Type: Fraste DR238
Total Depth: 101.20 m
Elevation: 1048.3 m
Azimuth , Inclination: 0 , -90

Page: 1 of 5
Date Started: 6 Sep 14
Date Completed: 13 Sep 14
Logged by: LEP
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
			SILTY SAND (0 to 2.44) Some fine grained, angular to subangular gravel; sand is low to medium plasticity, brown, compact, massive and dry.		SPT #1	57		26/50+	R			SPT refusal on coarse material
	1045.0		**WEATHERED BEDROCK** (2.44 to 9.25) Light grey to medium grey, fine to medium grained, inequigranular, massive, medium strong, calcite veins and veinlets throughout, trace quartz veins, moderately fractured, calcite and FeO infilling along joints, highly weathered.	100	SPT #2	0		50+	R			SPT refusal on bedrock
5				91				R3				
				95				R3				6.48 - 12.70 m - Lugeon Packer Test #1 - K = 4E-07 m/s
	1040.0			100				R3				
				100				R3				
10			**WEATHERED SHEAR ZONE** (9.25 to 14.96) Greyish orange, fine to medium grained, brecciated volcanics, highly altered, very weak, moderately fractured, calcite and clay infilling of joints and fractures, highly weathered - FeO staining throughout rock and along joints, dissolution weathering (vugs) present in several areas.	100				R1				
				100	UCS#1			R2				
	1035.0			86				R3				12.48 - 18.70 m - Lugeon Packer Test #2 - K = 1E-07 m/s
15			**VOLCANICLASTIC** (14.96 to 17.2) Light grey, fine to medium grained volcanics, porphyritic, medium strong with minor healed fractures, trace quartz bands, FeO and calcite infill along joints, trace disseminated pyrite visible, slightly weathered.	100				R3				
				100				R3				
	1030.0		**VOLCANICLASTIC** (17.2 to 32.6) Medium grey to greenish grey, fine to medium grained, porphyritic; some light grey, angular to subangular clasts (up to 5 cm), medium strong, FeO and calcite infill along joints, slightly weathered.	100				R3				
				100				R3				18.48 - 24.70 m - Lugeon Packer Test #3 - K = 1E-08 m/s
20				100				R3				
				100				R4				
	1025.0			100				R4				24.48 - 30.70 m - Lugeon

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-37

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project
Contractor: Geotech Drilling Services Ltd.
Location: East Embankment
Coordinates: 685,156 E , 5,607,136 N
Coordinate System: UTM NAD83 Zone 10
Hole Size ODEX: 0 - 3.05 m, HQ3: 3.05 - 101.20 m

Drillhole No.: DH14-037
Drill Type: Fraste DR238
Total Depth: 101.20 m
Elevation: 1048.3 m
Azimuth , Inclination: 0 , -90

Page: 2 of 5
Date Started: 6 Sep 14
Date Completed: 13 Sep 14
Logged by: LEP
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
30	1020.0		**VOLCANICLASTIC** (17.2 to 32.6) Medium grey to greenish grey, fine to medium grained, porphyritic; some light grey, angular to subangular clasts (up to 5 cm), medium strong, FeO and calcite infill along joints, slightly weathered.	100				R4				Packer Test #4 - K = 2E-08 m/s
				100				R4				
				96				R4				
				100				R4				
				100	UCS#2			R5				30.48 - 36.70 m - Lugeon Packer Test #5 - K = 5E-09 m/s
35	1015.0		**VOLCANICLASTIC** (32.6 to 36.43) Light grey, fine to medium grained, porphyritic, strong, massive, FeO staining along joints and within fractures, some calcite infilling of joints, calcite veinlets throughout rock, trace dissolution vugs, slightly to moderately weathered.	100				R4				
				100				R4				
				100				R4				
			VOLCANICLASTIC (36.43 to 57) Grey to greenish grey, fine to medium grained, porphyritic with dark grey angular to subangular clasts (up to 8 cm), many calcite veins and veinlets, calcite infilling along joints, trace quartz banding, very strong, fresh and unweathered, trace disseminated sulphides.	100				R5				36.48 - 42.70 m - Lugeon Packer Test #6 - K = 2E-09 m/s
40	1010.0			100				R5				
				100				R5				
				100				R5				
				99				R4				42.48 - 48.70 m - Lugeon Packer Test #7 - K = 2E-09 m/s
45	1005.0			100				R4				
				100				R4				
				100				R4				
	1000.0			96				R4				48.48 - 54.70 m - Lugeon Packer Test #8 - K = 3E-08 m/s

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-37

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project
Contractor: Geotech Drilling Services Ltd.
Location: East Embankment
Coordinates: 685,156 E , 5,607,136 N
Coordinate System: UTM NAD83 Zone 10
Hole Size ODEX: 0 - 3.05 m, HQ3: 3.05 - 101.20 m

Drillhole No.: DH14-037
Drill Type: Fraste DR238
Total Depth: 101.20 m
Elevation: 1048.3 m
Azimuth , Inclination: 0 , -90

Page: 3 of 5
Date Started: 6 Sep 14
Date Completed: 13 Sep 14
Logged by: LEP
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - × (20 40 60 80)	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
55	995.0		**VOLCANICLASTIC** (36.43 to 57) Grey to greenish grey, fine to medium grained, porphyritic with dark grey angular to subangular clasts (up to 8 cm), many calcite veins and veinlets, calcite infilling along joints, trace quartz banding, very strong, fresh and unweathered, trace disseminated sulphides.	100				R4				
				100				R4				
				99				R4				
				99				R4				54.48 - 60.70 m - Lugeon Packer Test #9 - K = 6E-09 m/s
				100				R4				
60	990.0		**VOLCANICLASTIC** (57 to 63.7) Grey to light greenish grey, fine to medium grained, minor brecciation throughout, trace clay seams and quartz bands up to 2 cm thick, fresh, disseminated pyrite visible throughout, strong, unweathered.	100				R3				
				100				R3				
			SHEAR ZONE (57.7 to 59.58) Light and dark greenish grey, fine to medium grained, weakly foliated, slightly fractured, calcite and chlorite infill, trace clay along fractures.	100				R4				
				97				R4				60.48 - 66.70 m - Lugeon Packer Test #10 - K = 1E-08 m/s
				100				R4				
65	985.0		**VOLCANICLASTIC** (63.7 to 72.7) Greenish grey, fine to medium grained, grey angular to subangular clasts up to 3 cm in diameter, quartz bands up to 1 cm thick, strong, fresh, trace calcite and chlorite infill along joints, trace calcite veinlets, unweathered.	100				R4				
				100				R4				
				100				R4				66.48 - 72.70 m - Lugeon Packer Test #11 - K = 1E-08 m/s
	980.0			100	UCS#3			R4				
70				100				R4				
				100				R4				
	975.0			98				R5				72.48 - 78.70 m - Lugeon Packer Test #12 - K = 1E-09 m/s

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-37

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: East Embankment

Coordinates: 685,156 E , 5,607,136 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 3.05 m, HQ3: 3.05 - 101.20 m

Drillhole No.: DH14-037

Drill Type: Fraste DR238

Total Depth: 101.20 m

Elevation: 1048.3 m

Azimuth , Inclination: 0 , -90

Page: 4 of 5

Date Started: 6 Sep 14

Date Completed: 13 Sep 14

Logged by: LEP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
80	970.0		**VOLCANICLASTIC** (72.7 to 101.2) Medium grey to greenish grey, fine to medium grained, porphyritic (dark grey clasts up to 10 cm), calcite veins and veinlets, some calcite infill along joints, massive, some larger dark grey clasts up to 20 cm containing disseminated pyrite, strong, fresh and unweathered.	100				R5				
				99				R5				
				100				R5				
				100				R4				
				100				R4				78.48 - 84.70 m - Lugeon Packer Test #13 - no take
				100				R4				
85	965.0			97				R4				
				98				R4				
				100				R4				84.48 - 90.70 m - Lugeon Packer Test #14 - K = 2E-08 m/s
				100				R4				
	960.0			100				R4				
90				100				R4				
				92				R5				90.48 - 101.20 m - Lugeon Packer Test #15 - K = 1E-08 m/s
				100				R4				
	955.0			100				R5				
				100				R5				
95				100				R5				
				100				R4				
	950.0			100				R4				

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-37

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: East Embankment

Coordinates: 685,156 E , 5,607,136 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 3.05 m, HQ3: 3.05 - 101.20 m

Drillhole No.: DH14-037

Drill Type: Fraste DR238

Total Depth: 101.20 m

Elevation: 1048.3 m

Azimuth , Inclination: 0 , -90

Page: 5 of 5

Date Started: 6 Sep 14

Date Completed: 13 Sep 14

Logged by: LEP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - × (20 40 60 80)	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
				100				R4				
			End of Drillhole: 101.2 m Reached Target Depth									
105	945.0											
	940.0											
110												
	935.0											
115												
	930.0											
120												
	925.0											

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-37

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Southeast Embankment

Coordinates: 685,215 E , 5,605,147 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 16.37 m, HQ3: 16.37 - 37.85 m

Drillhole No.: DH14-038

Drill Type: Fraste DR238

Total Depth: 37.85 m

Elevation: 1060.6 m

Azimuth , Inclination: 0 , -90

Page: 1 of 2

Date Started: 12 Sep 14

Date Completed: 15 Sep 14

Logged by: GNH

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
0	1060.0		**SILT** (0 to 13.32) Sandy to some sand, fine to medium grained; some gravel, fine to medium grained, subangular to subrounded; poorly graded, low plasticity to non-plastic, light brown to brown, loose to compact, dry, some clasts up to 2 cm in diameter.		SPT #1	92		16/15/23	38			SPT refusal on dense material
					SPT #2	100		14/21/28	49			
					SPT #3	100		29/41/33	R			
5	1055.0				SPT #4	100		17/28/50+	R			SPT refusal on dense material
					SPT #5	100		37/47/50+	R			
					SPT #6	100		8/29/42	71			SPT refusal on dense material SPT refusal on dense material
10	1050.0				SPT #7	100		34/48/50+	R			SPT refusal on dense material
					SPT #8	100		21/25/23	48			
			WEATHERED BEDROCK (13.32 to 16.37) Orange-brown to white; fine to medium grained, inequigranular; impossible to determine structure from ODEX chips; highly weathered; chips are uniform, up to 1 cm in diameter.		SPT #9	71		50+	R			SPT refusal on bedrock
15	1045.0		**VOLCANICLASTIC** (16.37 to 23.2) Pinkish grey with light green crystals; fine to medium grained; inequigranular, weak, massive; slightly to moderately weathered; healed joints throughout; strong, quartz and calcite veins and veinlets, minor vuggy textures, local rubble and clay-rich zones towards end of zone.	100				R4				
				100	UCS#1			R4				
20	1040.0			99				R4				19.57 m - 25.85 m - Lugeon Packer Test #1 - no take 19.57 m - 25.85 m - Falling Head Packer Test #1 - K = 2E-05 m/s
				33				R4				
				90				R4				
				63				R4				

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-38

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Southeast Embankment

Coordinates: 685,215 E , 5,605,147 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 16.37 m, HQ3: 16.37 - 37.85 m

Drillhole No.: DH14-038

Drill Type: Fraste DR238

Total Depth: 37.85 m

Elevation: 1060.6 m

Azimuth , Inclination: 0 , -90

Page: 2 of 2

Date Started: 12 Sep 14

Date Completed: 15 Sep 14

Logged by: GNH

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - × (20 40 60 80)	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
	1035.0		**FAULT ZONE** (23.2 to 27.9) Pink-grey; fine grained; inequigranular, massive; intensely fractured; moderately to slightly weathered; poor recovery due to faulted and fractured rock; vuggy textures, quartz and calcite veins and veinlets, FeO staining on joint surfaces, some local broken and rubble zones.	101				R4				
				100				R5				
			VOLCANICLASTIC (27.9 to 31.85) Dark grey with white, orange and brown zones; fine grained; inequigranular, massive; slightly weathered; healed joints throughout; strong, local clay rich zones, FeO staining on joint surfaces, quartz and carbonate veinlets.	100				R4				
30	1030.0			101				R4				
			VOLCANICLASTIC (31.85 to 37.85) Dark greenish grey; fine grained; inequigranular, massive; slightly weathered; strong, FeO staining on joint surfaces, calcite coating on some joints, quartz and carbonate veinlets throughout.	101	TRI#1			R5				
				100				R5				
35	1025.0			100	UCS#2			R5				
				100				R5				
			End of Drillhole: 37.85 m Reached Target Depth									
40	1020.0											
45	1015.0											

25.57 m - 31.85 m - Lugeon Packer Test #2 - no take
25.57 m - 31.85 m - Falling Head Packer Test #2 - K = 2E-07 m/s

31.57 m - 37.85 m - Lugeon Packer Test #3 - K = 4E-07 m/s
31.57 m - 37.85 m - Falling Head Packer Test #3 - K = 2E-06 m/s

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-38

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Southeast Embankment

Coordinates: 684,892 E , 5,605,143 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 42.70 m, HQ3: 42.70 - 65.20 m

Drillhole No.: DH14-039

Drill Type: Fraste DR238

Total Depth: 65.20 m

Elevation: 1057.3 m

Azimuth , Inclination: 0 , -90

Page: 1 of 3

Date Started: 14 Sep 14

Date Completed: 18 Sep 14

Logged by: LEP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
0	1057.3		**SILTY SAND** (0 to 12.19) Fine to medium grained; trace clay; well graded, non-plastic, brown to greyish brown, compact to dense, dry to moist.,		SPT #1	100		11/12/13	25			
	1055.0				SPT #2	100		10/15/17	32			
5					SPT #3	100		9/16/15	31			
					SPT #4	100		7/17/14	31			
	1050.0				SPT #5	100		6/8/9	17			
10					SPT #6	100		21/15/42	57			
					SPT #7	100		19/26/16	42			
	1045.0		**SILTY SAND WITH GRAVEL** (12.19 to 38.19) Fine to medium grained; trace gravel, fine to medium grained, angular to subrounded; well graded, non-plastic, brown to greyish brown, compact to dense, dry to moist, some clasts up to 2 cm in diameter.		SPT #8	100		11/13/11	24			Start injecting water for drilling
15					SPT #9	80		12/12/11	23			
					SPT #10	80		8/14/15	29			
	1040.0				SPT #11	89		20/35/25	60			
20					SPT #12	100		18/35/32	67			SPT refusal on dense material
	1035.0				SPT #13	100		6/11/14	25			

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-39

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project
Contractor: Geotech Drilling Services Ltd.
Location: Southeast Embankment
Coordinates: 684,892 E , 5,605,143 N
Coordinate System: UTM NAD83 Zone 10
Hole Size ODEX: 0 - 42.70 m, HQ3: 42.70 - 65.20 m

Drillhole No.: DH14-039
Drill Type: Fraste DR238
Total Depth: 65.20 m
Elevation: 1057.3 m
Azimuth , Inclination: 0 , -90

Page: 2 of 3
Date Started: 14 Sep 14
Date Completed: 18 Sep 14
Logged by: LEP
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
	1030.0		**SILTY SAND WITH GRAVEL** (12.19 to 38.19) Fine to medium grained; trace gravel, fine to medium grained, angular to subrounded; well graded, non-plastic, brown to greyish brown, compact to dense, dry to moist, some clasts up to 2 cm in diameter.		SPT #14	100		11/15/26	41			
30					SPT #15	96		45/50+	R			SPT refusal on coarse/ dense material
	1025.0				SPT #16	100		29/42/50	R			SPT refusal on cobble or boulder
35					SPT #17	100		50+	R			SPT refusal on cobble or boulder
	1020.0		**WEATHERED BEDROCK** (38.19 to 41.2) Grey to dark grey with some white and pinkish grey fragments; angular sand and fine grained gravel sized fragments returned from ODEX drilling; some clay and calcite pieces in ODEX return.		SPT #18	100		50+	R			SPT refusal on cobble or boulder
40			**FAULT ZONE** (41.2 to 47.2) Sandstone; grey to dark grey; clay throughout, fine to coarse grained gravel sized fragments, no sign of oxidation.	20				R1				
	1015.0			33				R1				
45				63				R2				
				23				R2				
	1010.0		**SANDSTONE** (47.2 to 53.2) Grey to dark grey; fine to medium grained; porphyritic, massive; fresh; healed joints throughout; medium strong; discontinuous calcite veins, trace clay infill.	100				R3				48.31 m - 54.70 m - Lugeon Packer Test #1 - K = 1E-09 m/s 48.31 m - 54.70 m - Falling
				99				R3				

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-39

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Southeast Embankment

Coordinates: 684,892 E , 5,605,143 N

Coordinate System: UTM NAD83 Zone 10

Hole Size ODEX: 0 - 42.70 m, HQ3: 42.70 - 65.20 m

Drillhole No.: DH14-039

Drill Type: Fraste DR238

Total Depth: 65.20 m

Elevation: 1057.3 m

Azimuth , Inclination: 0 , -90

Page: 3 of 3

Date Started: 14 Sep 14

Date Completed: 18 Sep 14

Logged by: LEP

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
			SANDSTONE (47.2 to 53.2) Grey to dark grey; fine to medium grained; porphyritic, massive; fresh; healed joints throughout; medium strong; discontinuous calcite veins, trace clay infill.	100				R3				Head Packer Test #1 - K = 3E-07 m/s
	1005.0			100				R3				
			SHEAR ZONE (53.2 to 56.2) Mudstone; grey to dark grey; fine grained; porphyritic, massive; fault zone; very weak, abundant clay gouge and rubble, calcite veins.	93				R1				53.01 m - 60.70 m - Lugeon Packer Test #2 - K = 2E-08 m/s
55				76				R1				
			MUDSTONE (56.2 to 59.55) Grey to dark grey; fine grained; porphyritic, weakly foliated; moderately to slightly weathered; healed fractures throughout; medium strong, clay seams, calcite veins, calcite infill.	100				R3				
	1000.0			100				R4				
60			**QUARTZ FELDSPAR PORPHYRY** (59.55 to 65.2) Light greenish brownish grey to reddish greenish brown; fine to coarse grained; porphyritic, almost brecciated; moderately weathered; many healed fractures, some joints dipping at 15° to core axis; weak to medium strong, clay and calcite infilling.	96				R3				59.01 m - 65.20 m - Lugeon Packer Test #3 - K = 2E-09 m/s
				97				R3				
	995.0			100				R3				
65				100				R3				
			End of Drillhole: 65.2 m Reached Target Depth									
	990.0											
70												
	985.0											

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-246/26	11	0

FIGURE C1-39

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-001 TO 039 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project
Contractor: Geotech Drilling Services Ltd.
Location: Plant Site
Coordinates: 686,689 E , 5,608,374 N
Coordinate System: UTM NAD 83 Zone 10
Hole Size HWT to 13.39m, HQ3 to 54.82m

Drillhole No.: DH14-040
Drill Type: Fraste DR239
Total Depth: 54.82 m
Elevation: 950.6 m
Azimuth , Inclination: 0 , -90

Page: 1 of 3
Date Started: 17 Oct 14
Date Completed: 19 Oct 14
Logged by: LEP/MAS
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
	950.0		**SILTY GRAVELLY SAND** (0 to 5.64) Fine grained, fine to medium grained, angular to subangular gravel, well graded, low to medium plasticity, greyish brown, dense, massive, moist.		SPT #1	34		19/19/22	41			
					SPT #2	100		8/24/20	44			
5					SPT #3	57		18/20/22	42			
	945.0		**SAND AND SILT** (5.64 to 12.7) Fine grained, trace fine grained, angular to subangular gravel, poorly graded, high plasticity, greyish brown, massive, stiff, moist to wet.		SPT #4	100		12/14/14	28			
					SPT #5	90		19/28/27	55			
10					SPT #6	100		5/13/17	30			
	940.0				SPT #7	49		13/24/35	59			
					SPT #8	100		7/13/16	29			
			PICRITE (12.7 to 17.32) Grey to greyish green, fine grained, porphyritic, weak, moderately weathered, massive.	0	SPT #9	100		50+	R			SPT refusal on bedrock
15				47				R2				
	935.0			100				R1				
				100				R3				
			FAULT ZONE (17.32 to 27.32) Faulted zone with clay and chlorite infilling, highly fractured and weathered.	94				R2				
				75				R2				

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-40

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project
Contractor: Geotech Drilling Services Ltd.
Location: Plant Site
Coordinates: 686,689 E , 5,608,374 N
Coordinate System: UTM NAD 83 Zone 10
Hole Size HWT to 13.39m, HQ3 to 54.82m

Drillhole No.: DH14-040
Drill Type: Fraste DR239
Total Depth: 54.82 m
Elevation: 950.6 m
Azimuth , Inclination: 0 , -90

Page: 2 of 3
Date Started: 17 Oct 14
Date Completed: 19 Oct 14
Logged by: LEP/MAS
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
	930.0		**FAULT ZONE** (17.32 to 27.32) Faulted zone with clay and chlorite infilling, highly fractured and weathered.	48				R1				
				74				R2				
				55				R2				
25	925.0			73				R2				
				100				R2				
			PICRITE (27.32 to 45.82) Grey to greyish green, fine grained, porphyritic, weak, moderately weathered, massive.	100				R3				
				65				R3				
30	920.0			97				R3				
				95				R2				
				96				R3				
				98				R3				
35	915.0			100				R3				
				100				R3				
				100				R3				

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-40

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Plant Site

Coordinates: 686,689 E , 5,608,374 N

Coordinate System: UTM NAD 83 Zone 10

Hole Size HWT to 13.39m, HQ3 to 54.82m

Drillhole No.: DH14-040

Drill Type: Fraste DR239

Total Depth: 54.82 m

Elevation: 950.6 m

Azimuth , Inclination: 0 , -90

Page: 3 of 3

Date Started: 17 Oct 14

Date Completed: 19 Oct 14

Logged by: LEP/MAS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - × (20 40 60 80)	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
	910.0		**PICRITE** (27.32 to 45.82) Grey to greyish green, fine grained, porphyritic, weak, moderately weathered, massive.	100				R3				
				95				R2				
				96				R2				
45				99				R2				
	905.0		**FAULT ZONE** (45.82 to 50.74) Faulted zone with clay, calcite and chlorite infilling, brecciated.	100				R2				
				89				R2				
50				100				R2				
	900.0			100				R2				
			PICRITE (50.74 to 54.82) Grey to greyish green, fine grained, porphyritic, weak, moderately weathered, massive.	100				R3				
				93				R3				
55				80				R3				
	895.0		End of Drillhole: 54.82 m Reached Target Depth									

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-40

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project
Contractor: Geotech Drilling Services Ltd.
Location: Plant Site
Coordinates: 686,349 E , 5,607,987 N
Coordinate System: UTM NAD 83 Zone 10
Hole Size HWT to 12.18m, HQ3 to 56.30m

Drillhole No.: DH14-041
Drill Type: Fraste DR239
Total Depth: 56.30 m
Elevation: 993.6 m
Azimuth , Inclination: 0 , -90

Page: 1 of 3
Date Started: 18 Oct 14
Date Completed: 19 Oct 14
Logged by: GNH/JAG
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
			SILT (0 to 6.1) Trace sand and gravel; gravel clasts up to 1 cm, angular to subrounded, gap graded; silt has low plasticity, medium brown with greenish grey clasts, no oxidation, loose, slightly moist.		SPT #1	92		11/8/14	22			
					SPT #2	89		9/19/50+	R			SPT refusal on coarse material
	990.0											
5					SPT #3	100		8/11/13	24			
			SILT (6.1 to 12.5) Trace sand and trace gravel; gravel clasts up to 1 cm, subangular to subrounded, poorly graded, medium plasticity, brown with grey clasts, loose, slightly moist.		SPT #4	67		7/15/15	30			
					SPT #5	100		6/16/19	35			
	985.0											
					SPT #6	100		8/14/16	30			
10					SPT #7	0		50+	R			SPT refusal on bedrock
				50				R4				
			VOLCANICLASTIC (12.5 to 39.2) Medium grey to light greenish grey, fine to medium grained, inequigranular, strong, mostly fresh and unweathered; calcite veins and veinlets throughout core.	47				R4				
	980.0											
15				93				R4				
				100				R4				
				100				R5				
	975.0			100				R4				
				100				R5				

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-41

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project
Contractor: Geotech Drilling Services Ltd.
Location: Plant Site
Coordinates: 686,349 E , 5,607,987 N
Coordinate System: UTM NAD 83 Zone 10
Hole Size HWT to 12.18m, HQ3 to 56.30m

Drillhole No.: DH14-041
Drill Type: Fraste DR239
Total Depth: 56.30 m
Elevation: 993.6 m
Azimuth , Inclination: 0 , -90

Page: 2 of 3
Date Started: 18 Oct 14
Date Completed: 19 Oct 14
Logged by: GNH/JAG
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - × (20 40 60 80)	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
			VOLCANICLASTIC (12.5 to 39.2) Medium grey to light greenish grey, fine to medium grained, inequigranular, strong, mostly fresh and unweathered; calcite veins and veinlets throughout core. **BROKEN ZONE** (21.15 to 23.3) Moderately fractured zone within unit.	100				R5				
				84				R4				
	970.0			98				R5				
25				100				R4				
				100				R5				
	965.0			99				R4				
30				97				R4				
				100				R4				
	960.0			99				R4				
35				93				R4				
				96				R4				
				97				R4				
	955.0			100				R4				
				100				R0				

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-41

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project
Contractor: Geotech Drilling Services Ltd.
Location: Plant Site
Coordinates: 686,349 E , 5,607,987 N
Coordinate System: UTM NAD 83 Zone 10
Hole Size HWT to 12.18m, HQ3 to 56.30m

Drillhole No.: DH14-041
Drill Type: Fraste DR239
Total Depth: 56.30 m
Elevation: 993.6 m
Azimuth , Inclination: 0 , -90

Page: 3 of 3
Date Started: 18 Oct 14
Date Completed: 19 Oct 14
Logged by: GNH/JAG
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - × (20 40 60 80)	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
			FAULT ZONE (39.2 to 51.6) Several microfaults and fractured rock with clay gouge throughout this volcaniclastic unit; medium grey to greenish grey, fine to coarse grained, highly fractured.	100				R0				
				71				R4				
	950.0			100				R4				
45				95				R3				
				77				R3				
				100				R4				
	945.0			24				R3				
50				91				R4				
			VOLCANICLASTIC (51.6 to 56.3) Medium grey to light greenish grey, fine to medium grained, inequigranular, strong, mostly fresh and unweathered; calcite veins and veinlets throughout core.	100				R4				
				100				R4				
				100				R4				
	940.0			100	UCS #1			R4				
55				98				R4				
			End of Drillhole: 56.3 m Reached Target Depth									
	935.0											

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-41

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Plant Site

Coordinates: 686,822 E , 5,607,957 N

Coordinate System: UTM NAD 83 Zone 10

Hole Size HWT to 36.65m, HQ3 to 81.95m

Drillhole No.: DH14-042

Drill Type: Fraste DR239

Total Depth: 81.95 m

Elevation: 967.4 m

Azimuth , Inclination: 0 , -90

Page: 1 of 5

Date Started: 19 Oct 14

Date Completed: 21 Oct 14

Logged by: GNH/JAG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
0			**SANDY SILT** (0 to 13.7) Some gravel, fine to coarse grained, well graded, angular to subrounded, slightly plastic, medium greyish brown, massive, moist.		SPT #1	78		23/50+	R			SPT refusal on coarse material
	965.0				SPT #2	75		9/14/23	37			
5					SPT #3	100		12/18/30	48			
					SPT #4	90		15/23/32	55			
	960.0				SPT #5	95		23/50+	R			SPT refusal on coarse/dense material
10					SPT #6	67		18/31/50+	R			SPT refusal on coarse/dense material
					SPT #7	100		17/34/46	80			SPT refusal on coarse/dense material
	955.0				SPT #8	100		14/24/35	59			
			SILT AND CLAY (13.7 to 19.88) Trace sand, fine grained, poorly graded, high plasticity, medium greyish brown, stiff, moist.		SPT #9	100		10/27/38	65			
15					SPT #10	100		6/10/13	23			Start injecting water for drilling
	950.0				SPT #11	100		9/15/10	25			

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-42

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Plant Site

Coordinates: 686,822 E , 5,607,957 N

Coordinate System: UTM NAD 83 Zone 10

Hole Size HWT to 36.65m, HQ3 to 81.95m

Drillhole No.: DH14-042

Drill Type: Fraste DR239

Total Depth: 81.95 m

Elevation: 967.4 m

Azimuth , Inclination: 0 , -90

Page: 2 of 5

Date Started: 19 Oct 14

Date Completed: 21 Oct 14

Logged by: GNH/JAG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
			SANDY SILT AND CLAY (19.88 to 27.5) Trace gravel, fine grained, poorly graded, high plasticity, medium greyish brown, dense, dry.									
					SPT #12	100		2/5/7	12			
	945.0											
25					SPT #13	100		3/8/12	20			
	940.0		**GRAVELLY SAND** (27.5 to 30.54) Some silt; gravel is fine to coarse grained, well graded, angular to subangular; silt is non-plastic, orange-white and grey, massive, moist.		SPT #14	100		17/17/23	40			
30					SPT #15	100		11/19/32	51			
	935.0		**GRAVELLY, CLAYEY SILT** (30.54 to 36.65) Gravelly, clayey SILT with some sand, fine to medium grained; gravel clasts up to 1 cm, subangular to subrounded, well graded; silt is greenish grey with medium plasticity.									
					SPT #16	82		23/30/37	67			
35												
	930.0		**PICRITE** (36.65 to 42.95) Fine to medium grained, purplish grey, very weak, highly weathered and altered with abundant clay gouge and minor quartz and carbonate veinlets and blebs. Faulted zone of Picrite material over 36.65 to 38.00 m interval.	100 100 100				R1 R1 R1				

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-42

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Plant Site

Coordinates: 686,822 E , 5,607,957 N

Coordinate System: UTM NAD 83 Zone 10

Hole Size HWT to 36.65m, HQ3 to 81.95m

Drillhole No.: DH14-042

Drill Type: Fraste DR239

Total Depth: 81.95 m

Elevation: 967.4 m

Azimuth , Inclination: 0 , -90

Page: 3 of 5

Date Started: 19 Oct 14

Date Completed: 21 Oct 14

Logged by: GNH/JAG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
	925.0			100				R1				
				100				R1				
			PICRITE (42.95 to 51.95) Fine to medium grained, dark greenish grey, very weak, highly weathered and altered with abundant clay gouge and minor quartz and carbonate veinlets and blebs. Faulted zone of Picrite material over 36.65 to 38.00 m interval.	100				R1				
45				100				R1				
	920.0			100				R1				
				100				R1				
50				100				R1				
				100				R1				
	915.0		**PICRITE** (51.95 to 80) Fine to medium grained, dark grey, very weak, highly weathered and altered with abundant clay gouge and minor quartz and carbonate veinlets and blebs; minor sections of intact but highly weathered rock. Faulted zone of Picrite material over 36.65 to 38.00 m interval.	102				R1				
55				102				R1				
				102				R1				
	910.0			102				R1				
				102				R1				

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-42

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Plant Site

Coordinates: 686,822 E , 5,607,957 N

Coordinate System: UTM NAD 83 Zone 10

Hole Size HWT to 36.65m, HQ3 to 81.95m

Drillhole No.: DH14-042

Drill Type: Fraste DR239

Total Depth: 81.95 m

Elevation: 967.4 m

Azimuth , Inclination: 0 , -90

Page: 4 of 5

Date Started: 19 Oct 14

Date Completed: 21 Oct 14

Logged by: GNH/JAG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
	905.0		**PICRITE** (51.95 to 80) Fine to medium grained, dark grey, very weak, highly weathered and altered with abundant clay gouge and minor quartz and carbonate veinlets and blebs; minor sections of intact but highly weathered rock. Faulted zone of Picrite material over 36.65 to 38.00 m interval.	102				R1				
				102				R1				
65				102				R1				
				84				R1				
	900.0			67				R1				
				102				R1				
70				102				R1				
				101				R1				
	895.0			81				R1				
				101				R1				
75				102				R1				
				102				R1				
	890.0			97				R2				
				96				R3				

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-42

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project
Contractor: Geotech Drilling Services Ltd.
Location: Plant Site
Coordinates: 686,822 E , 5,607,957 N
Coordinate System: UTM NAD 83 Zone 10
Hole Size HWT to 36.65m, HQ3 to 81.95m

Drillhole No.: DH14-042
Drill Type: Fraste DR239
Total Depth: 81.95 m
Elevation: 967.4 m
Azimuth , Inclination: 0 , -90

Page: 5 of 5
Date Started: 19 Oct 14
Date Completed: 21 Oct 14
Logged by: GNH/JAG
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - × (20 40 60 80)	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
			MAFIC TUFF (80 to 81.95) Fine to medium grained, light greenish grey, weak, unweathered, slight alteration with moderate clay content, minor quartz and carbonate veinlets.	97				R3				
	885.0		End of Drillhole: 81.95 m Reached Target Depth									
85												
	880.0											
90												
	875.0											
95												
	870.0											

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-42

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project
Contractor: Geotech Drilling Services Ltd.
Location: Plant Site
Coordinates: 686,309 E , 5,608,457 N
Coordinate System: UTM NAD 83 Zone 10
Hole Size HWT to 13.72m, HQ3 to 56.69m

Drillhole No.: DH14-043
Drill Type: Fraste DR238
Total Depth: 56.69 m
Elevation: 956.6 m
Azimuth , Inclination: 0 , -90

Page: 1 of 3
Date Started: 19 Oct 14
Date Completed: 20 Oct 14
Logged by: LEP/MAS
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
0	955.0		**SILTY, SANDY GRAVEL** (0 to 7.62) Fine to coarse grained, angular, well graded, low plasticity, medium greyish brown, compact, massive, wet.		SPT #1	95		9/10/18	28			
					SPT #2	100		9/16/23	39			
5					SPT #3	100		12/18/20	38			
	950.0				SPT #4	100		12/18/24	42			
			SILTY GRAVEL (7.62 to 12.19) Some sand. Fine to coarse grained, angular to subangular, well graded, medium plasticity, medium greyish brown, compact, massive, moist.		SPT #5	100		10/19/24	43			Start injecting water for drilling
10					SPT #6	100		23/21/29	50			
					SPT #7	100		10/14/17	31			
	945.0		**WEATHERED BEDROCK** (12.19 to 15.24) Bedrock contact at approximately 12.19 mbgs. ODEX drilling to 15.24 - sandstone chip samples.		SPT #8	100		8/18/23	41			
					SPT #9	0		50+	R			SPT refusal on bedrock
15			**NO RECOVERY** (15.24 to 15.68) Assumed lithology is Sandstone.	100				R3				
	940.0		**SANDSTONE** (15.98 to 19.39) Highly fractured rock with calcite and quartz veins and veinlets throughout, calcite and chlorite infill along joints.	100				R3				
				97				R4				

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-43

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project
Contractor: Geotech Drilling Services Ltd.
Location: Plant Site
Coordinates: 686,309 E , 5,608,457 N
Coordinate System: UTM NAD 83 Zone 10
Hole Size HWT to 13.72m, HQ3 to 56.69m

Drillhole No.: DH14-043
Drill Type: Fraste DR238
Total Depth: 56.69 m
Elevation: 956.6 m
Azimuth , Inclination: 0 , -90

Page: 2 of 3
Date Started: 19 Oct 14
Date Completed: 20 Oct 14
Logged by: LEP/MAS
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - × (20 40 60 80)	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
			SANDSTONE (19.39 to 27.64) Greenish grey, fine to medium grained, inequigranular, medium strong, moderately weathered, heavily fractured with some healed fractures, chlorite and calcite infill.	100				R4				
	935.0			87				R4				
				100				R4				
				99				R4				
25				100	UCS #1			R4				
	930.0			91				R4				
			VOLCANICLASTIC (27.64 to 56.69) Grey, fine to medium grained, porphyritic, medium strong to strong, mostly unweathered, massive; weak chlorite alteration with some chlorite staining along joints, trace calcite and quartz veinlets.	15				R3				
30				99				R3				
	925.0			100				R3				
				100				R3				
35				97				R3				
	920.0			100				R3				
				98				R3				
				100				R4				

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-43

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project
Contractor: Geotech Drilling Services Ltd.
Location: Plant Site
Coordinates: 686,309 E , 5,608,457 N
Coordinate System: UTM NAD 83 Zone 10
Hole Size HWT to 13.72m, HQ3 to 56.69m

Drillhole No.: DH14-043
Drill Type: Fraste DR238
Total Depth: 56.69 m
Elevation: 956.6 m
Azimuth , Inclination: 0 , -90

Page: 3 of 3
Date Started: 19 Oct 14
Date Completed: 20 Oct 14
Logged by: LEP/MAS
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - × (20 40 60 80)	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
	915.0		**VOLCANICLASTIC** (27.64 to 56.69) Grey, fine to medium grained, porphyritic, medium strong to strong, mostly unweathered, massive; weak chlorite alteration with some chlorite staining along joints, trace calcite and quartz veinlets.	100				R4				
				97				R4				
				100	UCS #2			R4				
45				100				R4				
	910.0			100				R4				
				100				R4				
50				97				R4				
	905.0			100				R4				
				100				R4				
			VOLCANICLASTIC (53.5 to 55.3) Highly fractured rock, weakly chloritized.	100				R3				
55				96				R4				
	900.0		End of Drillhole: 56.69 m Reached Target Depth									

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-43

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Potential Rock Quarry / SMRSF

Coordinates: 686,155 E , 5,607,908 N

Coordinate System: UTM NAD 83 Zone 10

Hole Size HWT to 4.22m, HQ3 to 35.11m

Drillhole No.: DH14-044

Drill Type: Fraste DR239

Total Depth: 35.11 m

Elevation: 1005.6 m

Azimuth , Inclination: 0 , -90

Page: 1 of 2

Date Started: 20 Oct 14

Date Completed: 21 Oct 14

Logged by: LEP/MAS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE
0	1005.0	**SILT AND GRAVEL** (0 to 1.7) Some sand, trace cobbles. Fine to coarse grained, subangular to subrounded, poorly graded, high plasticity, medium brown, compact, massive, wet.						
		WEATHERED BEDROCK (1.7 to 4.22) Bedrock contact at approximately 1.70 mbgs. ODEX drilling to 4.22 to confirm bedrock - volcaniclastic chip samples.		SPT #1	100		22/50+	R
		WEATHERED BEDROCK (4.22 to 5.11) Medium greenish grey, fine grained, inequigranular, weak, highly weathered, heavily fractured, joints infilled with chlorite and FeO.	35				R4	
5.0	1000.0	**VOLCANICLASTIC** (5.11 to 12.91) Medium greenish grey, fine grained, inequigranular, medium strong to strong, slightly weathered along joints, moderately fractured with some healed fractures, massive. Some calcite veins and veinlets throughout.	100				R4	
			100				R2	
			100				R3	
10.0	995.0		93				R4	
			41	UCS #1			R4	
		VOLCANICLASTIC (12.91 to 35.11) Medium to light greenish grey with reddish purple clasts, fine to coarse grained, inequigranular, medium strong to strong, slightly weathered along joints, moderately fractured with some healed fractures, massive. Some calcite veins and veinlets throughout.	97				R4	
15.0	990.0		100				R4	
			100				R4	
			100				R4	
			100				R4	

RQD

SPT TEST 'N' VALUES - ×

20 40 60 80

DRILLING NOTES

SPT refusal on bedrock

GENERAL REMARKS:

No piezometer installation.

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-44

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL LOG - NO INSTALLATION, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Potential Rock Quarry / SMRSF

Coordinates: 686,155 E , 5,607,908 N

Coordinate System: UTM NAD 83 Zone 10

Hole Size HWT to 4.22m, HQ3 to 35.11m

Drillhole No.: DH14-044

Drill Type: Fraste DR239

Total Depth: 35.11 m

Elevation: 1005.6 m

Azimuth , Inclination: 0 , -90

Page: 2 of 2

Date Started: 20 Oct 14

Date Completed: 21 Oct 14

Logged by: LEP/MAS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	DRILLING NOTES
	985.0		**VOLCANICLASTIC** (12.91 to 35.11) Medium to light greenish grey with reddish purple clasts, fine to coarse grained, inequigranular, medium strong to strong, slightly weathered along joints, moderately fractured with some healed fractures, massive. Some calcite veins and veinlets throughout.	100				R4			
				100				R4			
				100				R4			
25.0	980.0			100				R4			
				100				R4			
				100				R4			
30.0	975.0			100				R4			
				99	UCS #2			R4			
				100				R4			
35.0				100				R4			
	970.0		End of Drillhole: 35.11 m Reached Target Depth								

GENERAL REMARKS:

No piezometer installation.

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-44

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL LOG - NO INSTALLATION, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Potential Borrow Area

Coordinates: 686,420 E , 5,607,574 N

Coordinate System: UTM NAD 83 Zone 10

Hole Size HWT to 45.71m, HQ3 to 50.81m

Drillhole No.: DH14-045

Drill Type: Fraste DR239

Total Depth: 50.81 m

Elevation: 1029.6 m

Azimuth , Inclination: 0 , -90

Page: 1 of 3

Date Started: 21 Oct 14

Date Completed: 23 Oct 14

Logged by: LEP/MAS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
			SANDY SILT (0 to 12.19) Some gravel, trace cobbles, fine to medium grained, subangular to subrounded, well graded, medium plasticity, brown, compact, massive, moist.		SPT #1	100		14/24/50+	R			SPT refusal on coarse material
					SPT #2	100		11/12/15	27			
5	1025.0				SPT #3	100		7/16/17	33			
					SPT #4	100		9/14/17	31			
					SPT #5	95		16/32/26	58			Start injecting water for drilling
10	1020.0				SPT #6	23		37/31/30	61			
					SPT #7	100		18/23/50+	R			SPT refusal on coarse material
			SILTY, SANDY GRAVEL (12.19 to 18.28) Trace cobbles, fine to coarse grained, subangular to subrouned, well graded, low plasticity, brown with multicoloured gravel, compact, massive, wet.		SPT #8	100		15/22/34	56			
					SPT #9	100		12/18/30	48			
15	1015.0				SPT #10	98		18/33/27	60			
					SPT #11	15		18/30/37	67			
	1010.0											

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-45

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Potential Borrow Area

Coordinates: 686,420 E , 5,607,574 N

Coordinate System: UTM NAD 83 Zone 10

Hole Size HWT to 45.71m, HQ3 to 50.81m

Drillhole No.: DH14-045

Drill Type: Fraste DR239

Total Depth: 50.81 m

Elevation: 1029.6 m

Azimuth , Inclination: 0 , -90

Page: 2 of 3

Date Started: 21 Oct 14

Date Completed: 23 Oct 14

Logged by: LEP/MAS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
			SILTY SAND (18.28 to 28.04) Trace clay, trace gravel, fine to medium grained, angular to subangular, poorly graded, high plasticity, medium greyish brown, compact to dense, massive, moist to wet.		SPT #12	100		9/15/28	43			
25	1005.0				SPT #13	85		9/14/23	37			
					SPT #14	100		13/14/17	31			
30	1000.0		**SANDY, GRAVELLY SILT** (28.04 to 34.14) Trace clay, fine grained, angular to subangular, well graded, grey with multicoloured gravel, medium to high plasticity, stiff, massive, moist to wet.		SPT #15	20		15/23/30	53			
					SPT #16	8		16/18/24	42			
35	995.0		**SILTY SAND** (34.14 to 45.71) Some gravel, trace clay, fine to medium grained, angular to subrounded, poorly graded, high plasticity, grey with multicoloured gravel, dense, massive, moist.		SPT #17	39		9/15/18	33			
	990.0											

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-45

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Potential Borrow Area

Coordinates: 686,420 E , 5,607,574 N

Coordinate System: UTM NAD 83 Zone 10

Hole Size HWT to 45.71m, HQ3 to 50.81m

Drillhole No.: DH14-045

Drill Type: Fraste DR239

Total Depth: 50.81 m

Elevation: 1029.6 m

Azimuth , Inclination: 0 , -90

Page: 3 of 3

Date Started: 21 Oct 14

Date Completed: 23 Oct 14

Logged by: LEP/MAS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
			SILTY SAND (34.14 to 45.71) Some gravel, trace clay, fine to medium grained, angular to subrounded, poorly graded, high plasticity, grey with multicoloured gravel, dense, massive, moist.		SPT #18	100		5/16/18	34			
					SPT #19	100		8/14/19	33			
45	985.0											
			VOLCANICLASTIC (45.71 to 50.81) Greenish grey, fine grained, medium strong, mostly fresh with weathering along joints (FeO staining) - no infill, some calcite veins and veinlets throughout; some dissolution weathering as vugs at 48.20 m.	100	SPT #20	0		50+	R			SPT refusal on bedrock
				100	UCS #1			R4				
				100				R4				
50	980.0			100				R4				
			End of Drillhole: 50.81 m Reached Target Depth									
55	975.0											
	970.0											

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-45

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Plant Site

Coordinates: 686,872 E , 5,608,231 N

Coordinate System: UTM NAD 83 Zone 10

Hole Size HWT to 33.53m, HQ3 to 73.02m

Drillhole No.: DH14-046

Drill Type: Fraste DR238

Total Depth: 73.02 m

Elevation: 957.9 m

Azimuth , Inclination: 0 , -90

Page: 1 of 4

Date Started: 21 Oct 14

Date Completed: 23 Oct 14

Logged by: GNH/JAG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	DRILLING NOTES
			GRAVELLY SAND (0 to 1.52) Some silt, fine to coarse grained, non plastic, well graded, medium to light brown and grey, massive, dry.								
	955.0		**SILTY, GRAVELLY SAND** (1.52 to 4.56) Fine to coarse grained, angular to subrounded, non-plastic, well graded, light to medium brown, massive, moist.		SPT #1	84		16/30/32	62		
					SPT #2	89		12/24/39	63		
5.0			**GRAVELLY SAND** (4.56 to 7.6) Some silt, fine to coarse grained, angular to subrounded, non-plastic, well graded, medium greyish brown, massive, moist.		SPT #3	100		14/19/30	49		
					SPT #4	100		13/17/19	36		
	950.0		**SILTY SAND** (7.6 to 15.3) Trace gravel, fine grained, poorly graded, subangular, non-plastic, medium brown, massive, moist.		SPT #5	100		11/17/20	37		
10.0					SPT #6	100		14/21/27	48		
					SPT #7	82		13/21/34	55		
					SPT #8	100		16/50+	R		SPT refusal on coarse material
	945.0				SPT #9	100		18/16/19	35		
15.0			**SILT** (15.3 to 21.38) Some sand and gravel, fine grained, poorly grade, medium plasticity, medium greyish brown, moist to wet.		SPT #10	100		15/27/21	48		
	940.0				SPT #11	100		11/20/23	43		

GENERAL REMARKS:

Installed downhole seismic 2.5" PVC pipe.

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-46

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL LOG - NO INSTALLATION, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project
Contractor: Geotech Drilling Services Ltd.
Location: Plant Site
Coordinates: 686,872 E , 5,608,231 N
Coordinate System: UTM NAD 83 Zone 10
Hole Size HWT to 33.53m, HQ3 to 73.02m

Drillhole No.: DH14-046
Drill Type: Fraste DR238
Total Depth: 73.02 m
Elevation: 957.9 m
Azimuth , Inclination: 0 , -90

Page: 2 of 4
Date Started: 21 Oct 14
Date Completed: 23 Oct 14
Logged by: GNH/JAG
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - × (20 40 60 80)	DRILLING NOTES
			SAND (21.38 to 25.94) Some silt, fine grained, poorly graded, low plasticity, medium greyish brown, moist to wet.		SPT #12	100		34/50+	R		SPT refusal on dense material
	935.0				SPT #13	100		25/36/43	R		
25.0			**SILTY SAND** (25.94 to 31.39) Trace gravel, fine grained, poorly graded, low to medium plasticity, medium orangish brown, moist.		SPT #14	100		21/27/50+	R		SPT refusal on coarse/dense material
	930.0										
30.0					SPT #15	100		43/50+	R		SPT refusal on coarse material
			WEATHERED BEDROCK (31.39 to 34.02) Dark greenish grey to grey, fine to coarse grained, porphyritic, strong fragments, slightly weathered, massive; abundant quartz blebs throughout rock; healed joints throughout; sulphides present in veinlets.	50				R4			
	925.0		**IRON MASK HYBRID** (34.02 to 50.19) Dark greenish grey to grey, fine to medium grained, porphyritic, strong, slightly weathered, massive with localized brecciated zones; quartz fragments throughout rock; healed joints throughout; sulphides present in veinlets.	71				R4			
35.0				85				R4			
	920.0			81	UCS #1			R4			
				96				R4			

GENERAL REMARKS:
Installed downhole seismic 2.5" PVC pipe.

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-46

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL LOG - NO INSTALLATION, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Plant Site

Coordinates: 686,872 E , 5,608,231 N

Coordinate System: UTM NAD 83 Zone 10

Hole Size HWT to 33.53m, HQ3 to 73.02m

Drillhole No.: DH14-046

Drill Type: Fraste DR238

Total Depth: 73.02 m

Elevation: 957.9 m

Azimuth , Inclination: 0 , -90

Page: 3 of 4

Date Started: 21 Oct 14

Date Completed: 23 Oct 14

Logged by: GNH/JAG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - × (20 40 60 80)	DRILLING NOTES
45.0	915.0		**IRON MASK HYBRID** (34.02 to 50.19) Dark greenish grey to grey, fine to medium grained, porphyritic, strong, slightly weathered, massive with localized brecciated zones; quartz fragments throughout rock; healed joints throughout; sulphides present in veinlets.	100				R4			
				100				R3			
				100				R4			
				100				R4			
				72				R4			
50.0	910.0			43				R4			
				100				R4			
			MONZONITE (50.19 to 62.75) Greenish grey to dark grey, fine to medium grained, inequigranular, strong, slightly weathered, brecciated in parts; quartz fragments throughout rock; healed joints throughout; sulphides present in veinlets.	93				R4			
				100				R4			
55.0	905.0			100				R5			
				100				R5			
				100				R4			
	900.0			95				R4			

GENERAL REMARKS:

Installed downhole seismic 2.5" PVC pipe.

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-46

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL LOG - NO INSTALLATION, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project
Contractor: Geotech Drilling Services Ltd.
Location: Plant Site
Coordinates: 686,872 E , 5,608,231 N
Coordinate System: UTM NAD 83 Zone 10
Hole Size HWT to 33.53m, HQ3 to 73.02m

Drillhole No.: DH14-046
Drill Type: Fraste DR238
Total Depth: 73.02 m
Elevation: 957.9 m
Azimuth , Inclination: 0 , -90

Page: 4 of 4
Date Started: 21 Oct 14
Date Completed: 23 Oct 14
Logged by: GNH/JAG
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - × (20 40 60 80)	DRILLING NOTES
			MONZONITE (50.19 to 62.75) Greenish grey to dark grey, fine to medium grained, inequigranular, strong, slightly weathered, brecciated in parts; quartz fragments throughout rock; healed joints throughout; sulphides present in veinlets.	100				R5			
				101				R4			
	895.0		**IRON MASK HYBRID** (62.75 to 73.02) Medium greenish grey to grey, fine to medium grained, porphyritic, strong, slightly weathered, massive with localized brecciated zones; intensely fractured in parts with some localized rubble zones; healed joints throughout; sulphides present in veinlets; pervasive chlorite alteration.	80				R4			
65.0				87				R4			
				99				R4			
	890.0			101				R4			
				100				R4			
70.0				96				R4			
	885.0			93				R4			
			End of Drillhole: 73.02 m Reached Target Depth								
75.0											
	880.0										

GENERAL REMARKS:
Installed downhole seismic 2.5" PVC pipe.

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-46

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL LOG - NO INSTALLATION, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Plant Site

Coordinates: 686,506 E , 5,607,846 N

Coordinate System: UTM NAD 83 Zone 10

Hole Size HWT to 33.52m, HQ3 to 73.11m

Drillhole No.: DH14-047

Drill Type: Fraste DR238

Total Depth: 73.11 m

Elevation: 994.5 m

Azimuth , Inclination: 0 , -90

Page: 1 of 4

Date Started: 23 Oct 14

Date Completed: 25 Oct 14

Logged by: LEP/MAS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	DRILLING NOTES
			SILTY SAND (0 to 4.57) Trace gravel, fine to medium grained, angular to subangular, well graded, low to medium plasticity, medium brown with multicoloured gravel, dense, massive, dry to moist.		SPT #1	100		13/16/16	32		
					SPT #2	100		10/18/16	34		Start injecting water for drilling
	990.0				SPT #3	100		50+	R		SPT refusal on coarse material
5.0			**GRAVEL** (4.57 to 13.72) Some silt, some sand, trace cobbles, fine to coarse grained, subangular to angular, light grey with brown matrix, dense, massive, dry.								No SPTs for 20', switched to coring while still in overburden (gravel seam)
	985.0										
10.0					SPT #4	100		22/31/45	76		
					SPT #5	100		26/45/50+	R		SPT refusal on coarse material
					SPT #6	100		21/48/50+	R		SPT refusal on coarse material
	980.0		**SANDY GRAVEL** (13.72 to 18.29) Some silt, fine to coarse grained, subangular to subrounded, well graded, dense, massive, moist.								
15.0					SPT #7	100		27/36/49	R		SPT refusal on coarse material
					SPT #8	100		18/29/50+	R		SPT refusal on coarse material
	975.0		**GRAVELLY SAND** (18.29 to 30.56) Trace silt, trace gravel, fine grained, angular to subangular, poorly graded, greyish brown, non-plastic, compact, massive.								

GENERAL REMARKS:

Installed downhole seismic 2.5" PVC pipe.

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-47

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL LOG - NO INSTALLATION, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project
Contractor: Geotech Drilling Services Ltd.
Location: Plant Site
Coordinates: 686,506 E , 5,607,846 N
Coordinate System: UTM NAD 83 Zone 10
Hole Size HWT to 33.52m, HQ3 to 73.11m

Drillhole No.: DH14-047
Drill Type: Fraste DR238
Total Depth: 73.11 m
Elevation: 994.5 m
Azimuth , Inclination: 0 , -90

Page: 2 of 4
Date Started: 23 Oct 14
Date Completed: 25 Oct 14
Logged by: LEP/MAS
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	DRILLING NOTES
			GRAVELLY SAND (18.29 to 30.56) Trace silt, trace gravel, fine grained, angular to subangular, poorly graded, greyish brown, non-plastic, compact, massive.		SPT #9	100		11/22/36	58		
25.0	970.0				SPT #10	100		50+	R		SPT refusal on coarse material
					SPT #11	100		50+	R		SPT refusal on coarse material
30.0	965.0				SPT #12	0		50+	R		SPT refusal on bedrock
			WEATHERED BEDROCK (30.56 to 33.52) Washed silts with angular, greenish grey and orange rock chips from ODEX - bedrock confirmed at 30.56 mbgs.								
					SPT #13	0		50+	R		SPT refusal on bedrock
35.0	960.0		**WEATHERED BEDROCK** (33.52 to 35.61) Orangey grey, fine grained, equigranular, heavily to moderately weathered, very weak to weak, massive; FeO staining throughout rock; some chlorite, calcite and clay infilling along joints.	93				R2			
			VOLCANICLASTIC (35.61 to 62.61) Light to medium greenish grey, medium grained, equigranular, medium strong, slightly weathered, massive; some calcite, clay and FeO infilling along joints; moderately fractured; minor broken zones throughout interval; chlorite alteration.	100	UCS #1			R2			
				100				R2			
	955.0			98				R2			

GENERAL REMARKS:
Installed downhole seismic 2.5" PVC pipe.

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-47

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL LOG - NO INSTALLATION, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project
Contractor: Geotech Drilling Services Ltd.
Location: Plant Site
Coordinates: 686,506 E , 5,607,846 N
Coordinate System: UTM NAD 83 Zone 10
Hole Size HWT to 33.52m, HQ3 to 73.11m

Drillhole No.: DH14-047
Drill Type: Fraste DR238
Total Depth: 73.11 m
Elevation: 994.5 m
Azimuth , Inclination: 0 , -90

Page: 3 of 4
Date Started: 23 Oct 14
Date Completed: 25 Oct 14
Logged by: LEP/MAS
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - × (20 40 60 80)	DRILLING NOTES
45.0	950.0		**VOLCANICLASTIC** (35.61 to 62.61) Light to medium greenish grey, medium grained, equigranular, medium strong, slightly weathered, massive; some calcite, clay and FeO infilling along joints; moderately fractured; minor broken zones throughout interval; chlorite alteration.	99				R2			
				100				R2			
				100				R3			
				100				R3			
				80				R3			
				97				R3			
50.0	945.0			100				R3			
				100				R3			
				100				R3			
				99				R3			
55.0	940.0			97				R3			
				97	UCS #2			R3			
				100				R2			
	935.0										

GENERAL REMARKS:
Installed downhole seismic 2.5" PVC pipe.

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-47

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL LOG - NO INSTALLATION, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project
Contractor: Geotech Drilling Services Ltd.
Location: Plant Site
Coordinates: 686,506 E , 5,607,846 N
Coordinate System: UTM NAD 83 Zone 10
Hole Size HWT to 33.52m, HQ3 to 73.11m

Drillhole No.: DH14-047
Drill Type: Fraste DR238
Total Depth: 73.11 m
Elevation: 994.5 m
Azimuth , Inclination: 0 , -90

Page: 4 of 4
Date Started: 23 Oct 14
Date Completed: 25 Oct 14
Logged by: LEP/MAS
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - × (20 40 60 80)	DRILLING NOTES
65.0	930.0		**VOLCANICLASTIC** (35.61 to 62.61) Light to medium greenish grey, medium grained, equigranular, medium strong, slightly weathered, massive; some calcite, clay and FeO infilling along joints; moderately fractured; minor broken zones throughout interval; chlorite alteration.	97				R3			
				100				R3			
			VOLCANICLASTIC (62.61 to 73.11) Greenish grey with some purplish brown staining, medium grained, equigranular, weak to medium strong, moderately to highly weathered, massive; moderately to heavily fractured with calcite and FeO infilling along joints and within fractures. Rock becomes more competent towards the bottom of hole.	93				R3			
				97				R3			
				98				R3			
				99				R3			
70.0	925.0			100				R3			
				99				R3			
				95				R3			
75.0	920.0		End of Drillhole: 73.11 m Reached Target Depth								
	915.0										

GENERAL REMARKS:
Installed downhole seismic 2.5" PVC pipe.

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-47

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL LOG - NO INSTALLATION, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Plant Site

Coordinates: 686,549 E , 5,608,201 N

Coordinate System: UTM NAD 83 Zone 10

Hole Size HWT to 6.08m, HQ3 to 45.76m

Drillhole No.: DH14-048

Drill Type: Fraste DR238

Total Depth: 45.76 m

Elevation: 972.3 m

Azimuth , Inclination: 0 , -90

Page: 1 of 3

Date Started: 23 Oct 14

Date Completed: 24 Oct 14

Logged by: GNH/JAG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - × (20 40 60 80)	DRILLING NOTES
			SILT AND SAND (0 to 1.52) Some gravel, fine to coarse grained, angular to subrounded, poorly graded, medium brown, compact, massive, moist.		SPT #1	55		50+	R		SPT refusal on coarse material
	970.0		**GRAVELLY SAND** (1.52 to 6.08) Medium SAND, some gravel, trace silt, medium to coarse grained, angular to subrounded, poorly graded, medium brown, dense, massive, moist.		SPT #2	100		50+	R		SPT refusal on coarse material
5.0					SPT #3	100		50+	R		SPT refusal on coarse material
			WEATHERED BEDROCK (6.08 to 8.46) Volcaniclastic - Highly fractured, medium grey, fine to coarse grained, strong, slightly weathered, massive; FeO staining along joints.		SPT #4	0		50+	R		SPT refusal on bedrock
	965.0			97				R5			
			VOLCANICLASTIC (8.46 to 45.76) Medium grey to greenish grey, fine to coarse grained, strong, slightly weathered, mostly massive with some brecciated zones; moderately fractured with many well healed fractures; many calcite and quartz veins and veinlets; chlorite alteration throughout.	96				R5			
10.0				102				R5			
	960.0			100				R5			
				100	UCS #1			R5			
15.0				100				R5			
	955.0			102				R5			
				102				R5			
				101				R5			

GENERAL REMARKS:

Installed downhole seismic 2.5" PVC pipe.

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-48

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL LOG - NO INSTALLATION, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Plant Site

Coordinates: 686,549 E , 5,608,201 N

Coordinate System: UTM NAD 83 Zone 10

Hole Size HWT to 6.08m, HQ3 to 45.76m

Drillhole No.: DH14-048

Drill Type: Fraste DR238

Total Depth: 45.76 m

Elevation: 972.3 m

Azimuth , Inclination: 0 , -90

Date Started: 23 Oct 14

Date Completed: 24 Oct 14

Logged by: GNH/JAG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - × (20 40 60 80)	DRILLING NOTES
	950.0		**VOLCANICLASTIC** (8.46 to 45.76) Medium grey to greenish grey, fine to coarse grained, strong, slightly weathered, mostly massive with some brecciated zones; moderately fractured with many well healed fractures; many calcite and quartz veins and veinlets; chlorite alteration throughout.	102				R5			
				101				R5			
				100				R5			
25.0				100				R5			
	945.0			102				R5			
				98				R5			
30.0				102				R5			
				100				R5			
	940.0			97				R5			
				102				R5			
35.0				100				R5			
	935.0			102				R5			
				97				R5			

GENERAL REMARKS:

Installed downhole seismic 2.5" PVC pipe.

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-48

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL LOG - NO INSTALLATION, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project
Contractor: Geotech Drilling Services Ltd.
Location: Plant Site
Coordinates: 686,549 E , 5,608,201 N
Coordinate System: UTM NAD 83 Zone 10
Hole Size HWT to 6.08m, HQ3 to 45.76m

Drillhole No.: DH14-048
Drill Type: Fraste DR238
Total Depth: 45.76 m
Elevation: 972.3 m
Azimuth , Inclination: 0 , -90

Page: 3 of 3
Date Started: 23 Oct 14
Date Completed: 24 Oct 14
Logged by: GNH/JAG
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - × (20 40 60 80)	DRILLING NOTES
	930.0		**VOLCANICLASTIC** (8.46 to 45.76) Medium grey to greenish grey, fine to coarse grained, strong, slightly weathered, mostly massive with some brecciated zones; moderately fractured with many well healed fractures; many calcite and quartz veins and veinlets; chlorite alteration throughout.	102				R5			
				97				R5			
				101				R5			
45.0				102	UCS #2			R5			
	925.0		End of Drillhole: 45.76 m Reached Target Depth								
50.0											
	920.0										
55.0											
	915.0										

GENERAL REMARKS:
Installed downhole seismic 2.5" PVC pipe.

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-48

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL LOG - NO INSTALLATION, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project
Contractor: Geotech Drilling Services Ltd.
Location: Plant Site
Coordinates: 686,628 E , 5,608,520 N
Coordinate System: UTM NAD 83 Zone 10
Hole Size HWT to 13.68m, HQ3 to 59.20m

Drillhole No.: DH14-049
Drill Type: Fraste DR238
Total Depth: 59.20 m
Elevation: 928.6 m
Azimuth , Inclination: 0 , -90

Page: 1 of 3
Date Started: 24 Oct 14
Date Completed: 26 Oct 14
Logged by: GNH/JAG
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	DRILLING NOTES
			SILT AND SAND (0 to 4.56) Trace gravel, fine to coarse grained, poorly graded, low plasticity medium brown, stiff, massive, dry.		SPT #1	100		17/16/21	37		
	925.0				SPT #2	100		11/12/17	29		
5.0			**SILTY SAND** (4.56 to 9.12) Trace gravel, fine to medium grained, subangular to subrounded, poorly graded, non-plastic, medium greyish brown, dense, massive, dry to moist.		SPT #3	100		10/16/28	44		
					SPT #4	100		43/50+	R		SPT refusal on coarse material
					SPT #5	100		50+	R		SPT refusal on coarse material
	920.0				SPT #6	100		50+	R		SPT refusal on coarse material
10.0			**SANDY SILT AND GRAVEL** (9.12 to 10.64) Fine to coarse grained, angular to subangular, well graded, low plasticity, medium greyish brown, very dense, massive, moist.		SPT #7	100		50+	R		SPT refusal on coarse material
			SILTY SAND (10.64 to 12.5) Trace gravel, fine grained, poorly graded, low plasticity, light brownish grey, massive, dry.		SPT #8	80		35/50+	R		SPT refusal on coarse material
			WEATHERED BEDROCK (12.5 to 17.2) Mafic Volcanics - Highly fractured, medium greenish grey, highly weathered with zones of completely decomposed rock.		SPT #9	0		50+	R		SPT refusal on bedrock
	915.0			57				R4			
15.0				89				R4			
			MAFIC VOLCANICS (17.2 to 26.85) Medium greenish grey, fine grained, inequigranular, strong, slightly weathered; slightly fractured with FeO staining along joints; some calcite veins and veinlets throughout.	97				R4			
	910.0			97				R4			

GENERAL REMARKS:
Installed downhole seismic 2.5" PVC pipe.

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-49

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

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M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
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Project: Ajax Project
Contractor: Geotech Drilling Services Ltd.
Location: Plant Site
Coordinates: 686,628 E , 5,608,520 N
Coordinate System: UTM NAD 83 Zone 10
Hole Size HWT to 13.68m, HQ3 to 59.20m

Drillhole No.: DH14-049
Drill Type: Fraste DR238
Total Depth: 59.20 m
Elevation: 928.6 m
Azimuth , Inclination: 0 , -90

Page: 2 of 3
Date Started: 24 Oct 14
Date Completed: 26 Oct 14
Logged by: GNH/JAG
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - × (20 40 60 80)	DRILLING NOTES
			MAFIC VOLCANICS (17.2 to 26.85) Medium greenish grey, fine grained, inequigranular, strong, slightly weathered; slightly fractured with FeO staining along joints; some calcite veins and veinlets throughout.	101				R5			
				98				R4			
	905.0		**SHEAR ZONE** (22.8 to 25.1) Sheared Zone - weakly foliated, moderately fractured, some dissolution weathering.	87				R4			
25.0				96				R5			
			IRON MASK HYBRID (26.85 to 27.7) Medium grey, fine to medium grained, inequigranular, slightly weathered; highly fractured; chlorite alteration; trace sulphides present throughout; quartz and calcite veins and veinlets present throughout.	100				R4			
	900.0			100				R4			
30.0			**FAULT ZONE** (27.7 to 29.2) Highly fractured and altered zone with mostly rubble and clay gouge material.	82				R3			
			IRON MASK HYBRID (29.2 to 30.7) Medium grey, fine to medium grained, inequigranular, slightly weathered; highly fractured; chlorite alteration; trace sulphides present throughout; quartz and calcite veins and veinlets present throughout.	68				R3			
				13				R3			
	895.0		**FAULT ZONE** (30.7 to 33.7) Highly fractured and altered zone with mostly rubble and clay gouge material.	100				R4			
35.0			**IRON MASK HYBRID** (33.7 to 36.7) Medium grey, fine to medium grained, inequigranular, slightly weathered; highly fractured; chlorite alteration; trace sulphides present throughout; quartz and calcite veins and veinlets present throughout.	100				R3			
			FAULT ZONE (36.7 to 59.2) Highly fractured and altered zone with mostly rubble and clay gouge material in Iron Mask Hybrid unit.	96				R3			
	890.0			100				R3			

GENERAL REMARKS:
Installed downhole seismic 2.5" PVC pipe.

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-49

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL LOG - NO INSTALLATION, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Plant Site

Coordinates: 686,628 E , 5,608,520 N

Coordinate System: UTM NAD 83 Zone 10

Hole Size HWT to 13.68m, HQ3 to 59.20m

Drillhole No.: DH14-049

Drill Type: Fraste DR238

Total Depth: 59.20 m

Elevation: 928.6 m

Azimuth , Inclination: 0 , -90

Page: 3 of 3

Date Started: 24 Oct 14

Date Completed: 26 Oct 14

Logged by: GNH/JAG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - × (20 40 60 80)	DRILLING NOTES
45.0	885.0		**FAULT ZONE** (36.7 to 59.2) Highly fractured and altered zone with mostly rubble and clay gouge material in Iron Mask Hybrid unit.	95				R3			
				83				R3			
				83				R3			
				93				R4			
				82				R4			
50.0	880.0			100				R4			
				100				R4			
				91				R4			
				100				R4			
55.0	875.0			63				R4			
				100				R4			
				100				R4			
	870.0			100				R4			
			End of Drillhole: 59.2 m Reached Target Depth								

GENERAL REMARKS:

Installed downhole seismic 2.5" PVC pipe.

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-49

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL LOG - NO INSTALLATION, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Plant Site

Coordinates: 686,172 E , 5,608,138 N

Coordinate System: UTM NAD 83 Zone 10

Hole Size HWT to 5.13m, HQ3 to 45.50m

Drillhole No.: DH14-050

Drill Type: Fraste DR238

Total Depth: 45.50 m

Elevation: 994.3 m

Azimuth , Inclination: 0 , -90

Page: 1 of 3

Date Started: 25 Oct 14

Date Completed: 26 Oct 14

Logged by: LEP/MAS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	DRILLING NOTES
			SANDY, GRAVELLY SILT (0 to 3) Fine to coarse grained, angular to subangular, low plasticity, medium grey and brown, compact, massive, dry to moist.		SPT #1	100		9/14/11	25		
			SILTY, GRAVELLY SAND (3 to 4.57) Fine to coarse grained, subangular to angular, well graded, brown and grey, compact, massive, dry to moist.		SPT #2	100		8/11/13	24		
	990.0				SPT #3	67		50+	R		SPT refusal on bedrock
5.0			**WEATHERED BEDROCK** (4.57 to 5.63) Grey, fine to medium grained, angular rock fragments from ODEX drilling.								
			VOLCANICLASTIC (5.63 to 45.5) Grey to greenish grey, medium to coarse grained, medium strong, moderately weathered, porphyritic; chlorite and FeO infill along joints; calcite veins and veinlets throughout.	82				R3			
				100				R3			
				99	UCS #1			R3			
	985.0										
10.0			**BROKEN ZONE** (9.68 to 11.15) Highly fractured zone.	100				R4			
				100				R4			
				99				R4			
	980.0			99				R4			
15.0				100				R5			
				100				R4			
	975.0			100				R4			

GENERAL REMARKS:

Installed downhole seismic 2.5" PVC pipe.

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-50

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL LOG - NO INSTALLATION, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project
Contractor: Geotech Drilling Services Ltd.
Location: Plant Site
Coordinates: 686,172 E , 5,608,138 N
Coordinate System: UTM NAD 83 Zone 10
Hole Size HWT to 5.13m, HQ3 to 45.50m

Drillhole No.: DH14-050
Drill Type: Fraste DR238
Total Depth: 45.50 m
Elevation: 994.3 m
Azimuth , Inclination: 0 , -90

Page: 2 of 3
Date Started: 25 Oct 14
Date Completed: 26 Oct 14
Logged by: LEP/MAS
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - × (20 40 60 80)	DRILLING NOTES
			VOLCANICLASTIC (5.63 to 45.5) Grey to greenish grey, medium to coarse grained, medium strong, moderately weathered, porphyritic; chlorite and FeO infill along joints; calcite veins and veinlets throughout.	98				R4			
				100				R4			
				97	UCS #2			R4			
	970.0			100				R5			
25.0				98				R5			
				100				R5			
	965.0			100				R5			
30.0				100				R5			
				100				R5			
	960.0			100				R5			
35.0				100				R5			
				100				R5			
	955.0		**BROKEN ZONE** (21.6 to 22.5) Highly fractured zone.	100				R5			

GENERAL REMARKS:
Installed downhole seismic 2.5" PVC pipe.

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-50

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL LOG - NO INSTALLATION, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Plant Site

Coordinates: 686,172 E , 5,608,138 N

Coordinate System: UTM NAD 83 Zone 10

Hole Size HWT to 5.13m, HQ3 to 45.50m

Drillhole No.: DH14-050

Drill Type: Fraste DR238

Total Depth: 45.50 m

Elevation: 994.3 m

Azimuth , Inclination: 0 , -90

Page: 3 of 3

Date Started: 25 Oct 14

Date Completed: 26 Oct 14

Logged by: LEP/MAS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - × (20 40 60 80)	DRILLING NOTES
			VOLCANICLASTIC (5.63 to 45.5) Grey to greenish grey, medium to coarse grained, medium strong, moderately weathered, porphyritic; chlorite and FeO infill along joints; calcite veins and veinlets throughout.	100				R5			
				100				R5			
				100				R5			
45.0	950.0			100				R5			
			End of Drillhole: 45.5 m Reached Target Depth								
50.0	945.0										
	940.0										
55.0											
	935.0										

GENERAL REMARKS:

Installed downhole seismic 2.5" PVC pipe.

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-50

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL LOG - NO INSTALLATION, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: EMSRF

Coordinates: 686,887 E , 5,610,290 N

Coordinate System: UTM NAD 83 Zone 10

Hole Size HWT to 25.84m, HQ3 to 99.67m

Drillhole No.: DH14-051

Drill Type: Fraste DR238

Total Depth: 99.67 m

Elevation: 942.2 m

Azimuth , Inclination: 0 , -90

Page: 1 of 5

Date Started: 26 Oct 14

Date Completed: 28 Oct 14

Logged by: GNH/JAG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
			SANDY SILT (0 to 7.6) Some gravel, fine to coarse grained, well graded, angular to subrounded, low plasticity, medium brown with grey clasts, dense, massive, dry to moist.									
	940.0				SPT #1	100		14/23/19	42			
					SPT #2	100		10/25/21	46			
5					SPT #3	74		12/27/26	53			
					SPT #4	49		16/26/20	46			
	935.0		**SILT** (7.6 to 15.2) Some clay, some sand, trace gravel, fine to coarse grained, poorly graded, subangular to subrounded, low to medium plasticity, medium greyish brown, wet.		SPT #5	92		10/23/25	48			
					SPT #6	100		4/7/10	17			
10					SPT #7	100		10/9/12	21			
	930.0				SPT #8	100		7/8/8	16			
					SPT #9	100		7/10/15	25			
15			**SILTY SAND AND GRAVEL** (15.2 to 16.72) Fine to coarse grained, well graded, low plasticity, angular to subangular, medium greyish brown, moist.		SPT #10	100		6/10/17	27			
	925.0		**CLAY AND SILT** (16.72 to 18.85) Some sand, some gravel, fine to coarse grained, poorly graded, angular to subangular, medium plasticity, medium greyish brown, dense, laminated, wet.		SPT #11	96		16/21/34	55			

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-51

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: EMSRF

Coordinates: 686,887 E , 5,610,290 N

Coordinate System: UTM NAD 83 Zone 10

Hole Size HWT to 25.84m, HQ3 to 99.67m

Drillhole No.: DH14-051

Drill Type: Fraste DR238

Total Depth: 99.67 m

Elevation: 942.2 m

Azimuth , Inclination: 0 , -90

Page: 2 of 5

Date Started: 26 Oct 14

Date Completed: 28 Oct 14

Logged by: GNH/JAG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
			SAND (18.85 to 21.28) Some silt, some gravel, fine to coarse grained, well graded, angular to subrounded, low plasticity, medium brownish grey, soft, wet.		SPT #12	100		50+	R			SPT refusal on coarse material
	920.0		**SAND AND GRAVEL** (21.28 to 24.32) Some silt, fine to coarse grained, poorly graded, angular to subangular, non plastic, medium brownish grey, wet.									
25			**WEATHERED BEDROCK** (24.32 to 25.76) Monzonite bedrock recovered as medium grey sand and rock chips from ODEX drilling.		SPT #13	100		50+	R			SPT refusal on bedrock
			FAULT ZONE (25.76 to 35.17) Medium grey, fine to coarse grained, highly fractured and rubblized Monzonite unit, very weak; calcite infill in fractures; clay gouge present over this interval.	37				R4				
	915.0			82				R2				
				94				R3				
30				100				R4				
				75				R4				
	910.0			70				R4				
				90				R4				
35			**MONZONITE** (35.17 to 42.67) Light greenish grey to grey, fine to medium grained, inequigranular, medium strong to strong, slightly weathered; some small rubble zones; disseminated sulphides throughout; quartz and calcite veins and veinlets throughout; calcite infill along joints.	87				R4				
	905.0			90				R4				
				87				R4				

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-51

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project
Contractor: Geotech Drilling Services Ltd.
Location: EMSRF
Coordinates: 686,887 E , 5,610,290 N
Coordinate System: UTM NAD 83 Zone 10
Hole Size HWT to 25.84m, HQ3 to 99.67m

Drillhole No.: DH14-051
Drill Type: Fraste DR238
Total Depth: 99.67 m
Elevation: 942.2 m
Azimuth , Inclination: 0 , -90

Page: 3 of 5
Date Started: 26 Oct 14
Date Completed: 28 Oct 14
Logged by: GNH/JAG
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - × (20 40 60 80)	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
	900.0		**MONZONITE** (35.17 to 42.67) Light greenish grey to grey, fine to medium grained, inequigranular, medium strong to strong, slightly weathered; some small rubble zones; disseminated sulphides throughout; quartz and calcite veins and veinlets throughout; calcite infill along joints.	85				R4				
				100				R4				
			FAULT ZONE (42.67 to 47.27) Medium grey, fine to coarse grained, highly fractured and rubbleized Monzonite unit, very weak; calcite infill in fractures; clay gouge present over this interval.	91				R3				
45				43				R3				
				53				R3				
	895.0		**MONZONITE** (47.27 to 61.67) Greenish grey, fine to medium grained, inequigranular, medium strong, slightly weathered; healed joints throughout; calcite infill and coating along joint surfaces; some local fracture zones.	90				R4				
50				99				R4				
				100				R4				
	890.0			100				R4				
				100				R4				
55				100				R4				
	885.0			102				R4				
				100				R4				

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-51

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: EMSRF

Coordinates: 686,887 E , 5,610,290 N

Coordinate System: UTM NAD 83 Zone 10

Hole Size HWT to 25.84m, HQ3 to 99.67m

Drillhole No.: DH14-051

Drill Type: Fraste DR238

Total Depth: 99.67 m

Elevation: 942.2 m

Azimuth , Inclination: 0 , -90

Page: 4 of 5

Date Started: 26 Oct 14

Date Completed: 28 Oct 14

Logged by: GNH/JAG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
				100				R4				
				100				R4				
	880.0		**SHEAR ZONE** (61.67 to 63.67) Greenish grey, fine to medium grained, inequigranular, medium strong, slightly weathered; healed joints throughout; calcite infill and coating along joint surfaces; weakly foliated and altered; some rubbleized zones; trace vugs.	100				R4				
65			**MONZONITE** (63.67 to 70.3) Greenish grey, fine to medium grained, inequigranular, medium strong, slightly weathered; healed joints throughout; calcite infill and coating along joint surfaces; moderately to highly fractured.	100				R4				
				100				R5				
	875.0			99				R5				
				82				R5				
70				83				R4				
			FAULT (70.3 to 74.17) Brownish grey, fine to coarse grained Monzonite unit, highly fractured and rubbleized in parts, brecciated, very weak; calcite infill in fractures.	72				R4				
	870.0			100				R4				
			MONZONITE (74.17 to 99.67) Greenish grey, fine to medium grained, inequigranular, medium strong to strong, slightly weathered; healed joints throughout; calcite infill and coating along joint surfaces; moderately to highly fractured; some local rubble zones.	102				R5				
75				100				R5				
	865.0			101				R4				
				96				R4				

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-51

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: EMSRF

Coordinates: 686,887 E , 5,610,290 N

Coordinate System: UTM NAD 83 Zone 10

Hole Size HWT to 25.84m, HQ3 to 99.67m

Drillhole No.: DH14-051

Drill Type: Fraste DR238

Total Depth: 99.67 m

Elevation: 942.2 m

Azimuth , Inclination: 0 , -90

Page: 5 of 5

Date Started: 26 Oct 14

Date Completed: 28 Oct 14

Logged by: GNH/JAG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
85	860.0		**MONZONITE** (74.17 to 99.67) Greenish grey, fine to medium grained, inequigranular, medium strong to strong, slightly weathered; healed joints throughout; calcite infill and coating along joint surfaces; moderately to highly fractured; some local rubble zones.	96				R4				
				78				R4				
				102				R4				
				99				R4				
	855.0			100				R4				
90				100				R4				
				97				R4				
				93				R4				
	850.0			100				R4				
95				94				R4				
				97				R4				
	845.0			98				R4				
				99				R4				
			End of Drillhole: 99.67 m Reached Target Depth									

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-51

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Truck Shop Area

Coordinates: 686,717 E , 5,609,681 N

Coordinate System: UTM NAD 83 Zone 10

Hole Size HWT to 44.19m, HQ3 to 50.58m

Drillhole No.: DH14-052

Drill Type: Fraste DR238

Total Depth: 50.58 m

Elevation: 925.6 m

Azimuth , Inclination: 0 , -90

Page: 1 of 3

Date Started: 26 Oct 14

Date Completed: 28 Oct 14

Logged by: LEP/MAS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
0	925.0		**GRAVELLY SAND** (0 to 21.34) Fine to coarse grained, some silt, angular to subangular, well graded, non-plastic, greyish brown, very dense, massive, moist to wet.		SPT #1	67		12/34/30	64			
					SPT #2	100		22/50+	R			SPT refusal on coarse material
5	920.0				SPT #3	100		50+	R			Water injected from approximately 4.00m to end of run. SPT refusal on coarse material
					SPT #4	100		50+	R			SPT refusal on coarse material
					SPT #5	100		50+	R			Water used to drill from 7.62m to end of hole. SPT refusal on coarse material
10	915.0				SPT #6	100		50+	R			SPT refusal on dense material
					SPT #7	100		50+	R			
					SPT #8	100		26/38/50+	R			SPT refusal on dense material
					SPT #9	100		25/50+	R			SPT refusal on dense material
15	910.0				SPT #10	75		41/50+	R			SPT refusal on dense material
					SPT #11	96		19/50+	R			

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-52

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project
Contractor: Geotech Drilling Services Ltd.
Location: Truck Shop Area
Coordinates: 686,717 E , 5,609,681 N
Coordinate System: UTM NAD 83 Zone 10
Hole Size HWT to 44.19m, HQ3 to 50.58m

Drillhole No.: DH14-052
Drill Type: Fraste DR238
Total Depth: 50.58 m
Elevation: 925.6 m
Azimuth , Inclination: 0 , -90

Page: 2 of 3
Date Started: 26 Oct 14
Date Completed: 28 Oct 14
Logged by: LEP/MAS
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
	905.0											
			SILTY SAND (21.34 to 30.47) Some gravel, fine to coarse grained, angular to subangular, well graded, low plasticity, brownish grey matrix with lithic clasts, very dense, massive, moist.		SPT #12	100		16/27/46	73	×		
					SPT #13	100		25/21/31	52	×		
25	900.0				SPT #14	100		17/33/41	74	×		
30	895.0		**SANDY SILT** (30.47 to 39.62) Some gravel, fine to coarse grained, angular to subrounded, well graded, medium plasticity, brownish grey matrix with lithic clasts, compact, massive, moist.		SPT #15	100		8/25/26	51	×		SPT refusal on dense material
					SPT #16	100		37/50+	R	●		SPT refusal on dense material
35	890.0				SPT #17	0		44/50+	R	●		SPT refusal on coarse material
					SPT #18	0		50+	R	●		SPT refusal on bedrock

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-52

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Truck Shop Area

Coordinates: 686,717 E , 5,609,681 N

Coordinate System: UTM NAD 83 Zone 10

Hole Size HWT to 44.19m, HQ3 to 50.58m

Drillhole No.: DH14-052

Drill Type: Fraste DR238

Total Depth: 50.58 m

Elevation: 925.6 m

Azimuth , Inclination: 0 , -90

Page: 3 of 3

Date Started: 26 Oct 14

Date Completed: 28 Oct 14

Logged by: LEP/MAS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
	885.0	**GRAVELLY SAND** (39.62 to 42.66) Some silt, grey, wet; gravel is fine grained, angular to subangular.									
		WEATHERED BEDROCK (42.66 to 44.19) Silty GRAVEL, grey, wet; gravel is fine grained, angular to subangular; bedrock chips from ODEX drilling, bedrock contact at approximately 42.66 mbgs.		SPT #19	0		50+	R			
			66.67				R3				
45	880.0	**SUGARLOAF DIORITE** (44.19 to 47.08) Light greenish grey, fine to medium grained, inequigranular, weak, moderately weathered; highly fractured and rubbleized in parts; FeO staining along fractures; some calcite and chlorite infill along fractures.	73.33				R3				
			100				R4				
		SUGARLOAF DIORITE (47.08 to 50.58) Light grey to greenish grey, fine to medium grained, inequigranular, weak, slightly weathered; highly fractured and rubbleized in parts; some calcite and chlorite infill along fractures.	80				R3				
50			94				R3				
	875.0	End of Drillhole: 50.58 m Reached Target Depth									
55	870.0										

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-52

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: EMSRF

Coordinates: 687,203 E , 5,609,777 N

Coordinate System: UTM NAD 83 Zone 10

Hole Size HWT to 12.16m, HQ3 to 27.75m

Drillhole No.: DH14-053

Drill Type: Fraste DR238

Total Depth: 27.75 m

Elevation: 891.6 m

Azimuth , Inclination: 0 , -90

Page: 1 of 2

Date Started: 28 Oct 14

Date Completed: 29 Oct 14

Logged by: GNH/JAG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
	890.0		**SILTY SAND** (0 to 4.56) Some gravel, fine to coarse grained, well graded, angular to subangular, non-plastic, medium brown, dense, massive, moist.		SPT #1	100		20/24/33	57			
					SPT #2	0		50+	R			SPT refusal on coarse material
5			**SAND AND GRAVEL** (4.56 to 6.08) Some silt, fine to coarse grained, poorly graded, angular to subangular, non-plastic, medium brownish grey, dense, massive, moist.		SPT #3	0		50+	R			SPT refusal on coarse material
	885.0		**SILT AND SAND** (6.08 to 12.16) Some gravel, fine to coarse grained, well graded, angular to subrounded, low plasticity, medium greyish-brown, very dense, massive, moist.		SPT #4	100		50+	R			SPT refusal on coarse material
					SPT #5	100		39/50+	R			SPT refusal on coarse material
10					SPT #6	100		27/50+	R			SPT refusal on coarse material
	880.0				SPT #7	0		50+	R			SPT refusal on bedrock
			MONZONITE (12.16 to 15.75) Medium grey, fine to coarse grained, highly fractured, weak, moderately weathered; FeO staining along fractures, weak chlorite alteration; some disseminated pyrite.	76				R4				
				97				R4				
15				90				R4				
	875.0		**MONZONITE** (15.75 to 27.75) Medium to light grey, fine to medium grained, inequigranular, strong, slightly weathered; moderately fractured with some local rubble zones; many healed joints and fractures; trace calcite in fractures.	88				R5				
				100				R5				
				100				R5				

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-53

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project
Contractor: Geotech Drilling Services Ltd.
Location: EMSRF
Coordinates: 687,203 E , 5,609,777 N
Coordinate System: UTM NAD 83 Zone 10
Hole Size HWT to 12.16m, HQ3 to 27.75m

Drillhole No.: DH14-053
Drill Type: Fraste DR238
Total Depth: 27.75 m
Elevation: 891.6 m
Azimuth , Inclination: 0 , -90

Page: 2 of 2
Date Started: 28 Oct 14
Date Completed: 29 Oct 14
Logged by: GNH/JAG
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
	870.0		**MONZONITE** (15.75 to 27.75) Medium to light grey, fine to medium grained, inequigranular, strong, slightly weathered; moderately fractured with some local rubble zones; many healed joints and fractures; trace calcite in fractures.	100				R5				
				86				R5				
25				100				R5				
	865.0			100				R5				
				99				R5				
			End of Drillhole: 27.75 m Reached Target Depth									
30	860.0											
35	855.0											

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-53

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Truck Shop Area

Coordinates: 686,930 E , 5,609,593 N

Coordinate System: UTM NAD 83 Zone 10

Hole Size HWT to 45.71m, HQ3 to 52.11m

Drillhole No.: DH14-054

Drill Type: Fraste DR238

Total Depth: 52.11 m

Elevation: 899.6 m

Azimuth , Inclination: 0 , -90

Page: 1 of 3

Date Started: 28 Oct 14

Date Completed: 30 Oct 14

Logged by: LEP/MAS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	DRILLING NOTES
			GRAVELLY SAND (0 to 3.05) Trace silt, fine to coarse grained, subangular to subrounded, poorly graded, non-plastic, brown, dense, massive, dry.		SPT #1	100		21/27/26	53		
	895.0		**GRAVELLY SILT** (3.05 to 14.33) Trace fine sand, fine to coarse grained, subangular to subrounded, gap graded, low to medium plasticity, compact, massive, moist.		SPT #2	100		6/11/11	22		
5.0					SPT #3	52		10/31/22	53		
					SPT #4	100		12/26/30	56		
					SPT #5	100		7/12/20	32		
	890.0				SPT #6	100		8/12/14	26		
10.0					SPT #7	100		12/19/25	44		
					SPT #8	100		7/11/14	25		
					SPT #9	100		7/12/12	24		
	885.0		**SILT** (14.33 to 18.9) Some clay, trace sand, trace gravel, fine to medium grained, subangular to subrounded, poorly graded, high plasticity, brownish-grey, compact, stiff, moist.								
15.0					SPT #10	100		8/11/14	25		Start injecting water for drilling
					SPT #11	100		8/6/10	16		
	880.0										

GENERAL REMARKS:

No piezometer installation.

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-54

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL LOG - NO INSTALLATION, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Truck Shop Area

Coordinates: 686,930 E , 5,609,593 N

Coordinate System: UTM NAD 83 Zone 10

Hole Size HWT to 45.71m, HQ3 to 52.11m

Drillhole No.: DH14-054

Drill Type: Fraste DR238

Total Depth: 52.11 m

Elevation: 899.6 m

Azimuth , Inclination: 0 , -90

Page: 2 of 3

Date Started: 28 Oct 14

Date Completed: 30 Oct 14

Logged by: LEP/MAS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	DRILLING NOTES
			CLAYEY SAND (18.9 to 24.99) Fine to coarse grained, trace gravel, fine grained, trace silt. Angular to subangular, gap graded, high plasticity, brownish grey, stiff, massive, moist.		SPT #12	100		4/7/9	16		
	875.0				SPT #13	100		6/4/12	16		
25.0			**SILTY SAND** (24.99 to 39.62) Trace clay, trace gravel, fine to medium grained, angular to subangular, poorly graded, medium plasticity, brownish-grey, very dense, massive, moist.		SPT #14	44		17/31/40	71		
	870.0				SPT #15	100		12/11/19	30		
30.0					SPT #16	100		6/12/25	37		
	865.0				SPT #17	100		17/26/50+	R		SPT refusal on dense material
35.0											
	860.0										

GENERAL REMARKS:

No piezometer installation.

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-54

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL LOG - NO INSTALLATION, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Truck Shop Area

Coordinates: 686,930 E , 5,609,593 N

Coordinate System: UTM NAD 83 Zone 10

Hole Size HWT to 45.71m, HQ3 to 52.11m

Drillhole No.: DH14-054

Drill Type: Fraste DR238

Total Depth: 52.11 m

Elevation: 899.6 m

Azimuth , Inclination: 0 , -90

Page: 3 of 3

Date Started: 28 Oct 14

Date Completed: 30 Oct 14

Logged by: LEP/MAS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - × (20 40 60 80)	DRILLING NOTES
			SAND (39.62 to 42.66) Medium grained, trace gravel, angular to subangular, poorly graded, non-plastic, loose, massive, moist.		SPT #18	100		10/23/40	63		
			WEATHERED BEDROCK (42.66 to 45.71) Gravelly SAND, medium to coarse grained, angular, orangey brown - bedrock confirmed at 44.71 m.		SPT #19	100		22/50+	R		SPT refusal on bedrock
45.0	855.0		**SUGARLOAF DIORITE** (45.71 to 52.11) Greenish grey, fine to medium grained, equigranular, massive, strong, slightly weathered; some healed joints; some calcite and FeO infill; trace sulphides.	52				R4			
				97				R4			
				100				R4			
50.0	850.0			97				R4			
				100	UCS #1			R4			
			End of Drillhole: 52.11 m Reached Target Depth								
55.0	845.0										
	840.0										

GENERAL REMARKS:

No piezometer installation.

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-54

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL LOG - NO INSTALLATION, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: EMRSF Water Management Pond

Coordinates: 687,369 E , 5,609,541 N

Coordinate System: UTM NAD 83 Zone 10

Hole Size HWT to 57.90m, HQ3 to 63.90m

Drillhole No.: DH14-055

Drill Type: Fraste DR238

Total Depth: 63.90 m

Elevation: 882.5 m

Azimuth , Inclination: 0 , -90

Page: 1 of 4

Date Started: 29 Oct 14

Date Completed: 31 Oct 14

Logged by: GNH/JAG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	DRILLING NOTES
			SANDY SILT (0 to 3.04) Some gravel up to 2 cm, angular to subrounded, well graded, low plasticity, medium brown, dense, moist.		SPT #1	100		14/21/20	41		
	880.0		**SILT** (3.04 to 4.56) Some sand, some gravel, trace clay; gravel clasts up to 1 cm, angular to subrounded, poorly graded; low to medium plasticity, brown, dense, moist.		SPT #2	100		12/20/18	38		
5.0			**CLAY AND SILT** (4.56 to 6.08) Trace sand, trace gravel; fine grained, poorly graded, ow to medium plasticity, medium greyish brown, very firm, massive, moist to wet.		SPT #3	100		11/15/21	36		
					SPT #4	100		8/13/20	33		
	875.0		**SILT** (6.08 to 9.12) Some sand, some gravel; fine to coarse grained, subangular to subrounded, well grade, low plasticity, dark greyish-brown, very firm, massive, moist to wet.		SPT #5	93		10/24/26	50		
10.0			**CLAYEY SILT** (9.12 to 10.64) Some gravel, trace sand, fine to coarse grained, angular to subangular, poorly graded, medium plasticity, dark greyish-brown, firm, massive, wet.		SPT #6	75		12/23/35	58		
			GRAVELLY SILT (10.64 to 18.24) Some sand, fine to coarse grained, angular to subrounded, well graded, low to medium plasticity, dark brownish-grey, very dense, massive, wet.		SPT #7	9		15/25/33	58		
	870.0				SPT #8	100		21/29/50+	R		SPT refusal on coarse/dense material
					SPT #9	100		13/26/27	53		
15.0					SPT #10	85		15/25/36	61		
	865.0										
			GRAVELLY SAND (18.24 to 22.8) Some silt, fine to coarse grained, angular to subrounded, well graded, non-plastic, medium orange-brown, compact, massive, wet.		SPT #11	73		30/50+	R		SPT refusal on coarse material

GENERAL REMARKS:

No piezometer installation.

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-55

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL LOG - NO INSTALLATION, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: EMRSF Water Management Pond

Coordinates: 687,369 E , 5,609,541 N

Coordinate System: UTM NAD 83 Zone 10

Hole Size HWT to 57.90m, HQ3 to 63.90m

Drillhole No.: DH14-055

Drill Type: Fraste DR238

Total Depth: 63.90 m

Elevation: 882.5 m

Azimuth , Inclination: 0 , -90

Page: 2 of 4

Date Started: 29 Oct 14

Date Completed: 31 Oct 14

Logged by: GNH/JAG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	DRILLING NOTES
			GRAVELLY SAND (18.24 to 22.8) Some silt, fine to coarse grained, angular to subrounded, well graded, non-plastic, medium orange-brown, compact, massive, wet.		SPT #12	47		50/50+	R		Start injecting water for drilling SPT refusal on coarse material
	860.0		**GRAVELLY SILT AND SAND** (22.8 to 27.36) Fine to coarse grained, angular to subangular, well graded, medium brownish-grey, very dense, massive, wet.		SPT #13	58		33/50+	R		SPT refusal on coarse/dense material
25.0											
	855.0		**SAND AND GRAVEL** (27.36 to 44.08) Some silt, fine to coarse grained, angular to subangular, well graded, non-plastic, medium brownish grey, dense massive, wet.		SPT #14	100		34/50+	R		SPT refusal on dense material
30.0					SPT #15	83		43/50+	R		SPT refusal on coarse/dense material
	850.0				SPT #16	0		27/50+	R		SPT refusal on coarse material
35.0					SPT #17	74		12/40/43	83		
	845.0										Injecting super foam with water for heaving sands
					SPT #18	59		3/4/19	23		

GENERAL REMARKS:

No piezometer installation.

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-55

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL LOG - NO INSTALLATION, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: EMRSF Water Management Pond

Coordinates: 687,369 E , 5,609,541 N

Coordinate System: UTM NAD 83 Zone 10

Hole Size HWT to 57.90m, HQ3 to 63.90m

Drillhole No.: DH14-055

Drill Type: Fraste DR238

Total Depth: 63.90 m

Elevation: 882.5 m

Azimuth , Inclination: 0 , -90

Page: 3 of 4

Date Started: 29 Oct 14

Date Completed: 31 Oct 14

Logged by: GNH/JAG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	DRILLING NOTES
			SAND AND GRAVEL (27.36 to 44.08) Some silt, fine to coarse grained, angular to subangular, well graded, non-plastic, medium brownish grey, dense massive, wet.								
	840.0				SPT #19	65		12/48/50+	R		SPT refusal on coarse material
45.0			**SAND** (44.08 to 51) Some gravel (mixed lithologies), fine to coarse grained, angular to subrounded, poorly graded, non-plastic, loose, wet.								
					SPT #20	38		2/6/17	23		
	835.0										Stop performing SPTs due to heaving sands
50.0											
			WEATHERED BEDROCK (51 to 57.9) SAND and BEDROCK chips, medium to coarse grained, angular, medium grey orange - bedrock at approximately 51.0 m.								
	830.0										
55.0											
	825.0										
			SUGARLOAF DIORITE (57.9 to 63.9) Medium greenish grey, fine to coarse grained, massive, moderately fractured, medium strength, moderately weathered; calcite and chlorite infilling along joints; weak epidote and chlorite alteration.	97				R4			
				100				R4			

GENERAL REMARKS:

No piezometer installation.

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-55

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL LOG - NO INSTALLATION, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project
Contractor: Geotech Drilling Services Ltd.
Location: EMRSF Water Management Pond
Coordinates: 687,369 E , 5,609,541 N
Coordinate System: UTM NAD 83 Zone 10
Hole Size HWT to 57.90m, HQ3 to 63.90m

Drillhole No.: DH14-055
Drill Type: Fraste DR238
Total Depth: 63.90 m
Elevation: 882.5 m
Azimuth , Inclination: 0 , -90

Page: 4 of 4
Date Started: 29 Oct 14
Date Completed: 31 Oct 14
Logged by: GNH/JAG
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - × (20 40 60 80)	DRILLING NOTES
	820.0		**SUGARLOAF DIORITE** (57.9 to 63.9) Medium greenish grey, fine to coarse grained, massive, moderately fractured, medium strength, moderately weathered; calcite and chlorite infilling along joints; weak epidote and chlorite alteration.	100 100 99				R4 R5 R5			
65.0	815.0		End of Drillhole: 63.9 m Reached Target Depth								
70.0	810.0										
75.0	805.0										

GENERAL REMARKS:
No piezometer installation.

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-55

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL LOG - NO INSTALLATION, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Truck Shop Area

Coordinates: 686,850 E , 5,609,386 N

Coordinate System: UTM NAD 83 Zone 10

Hole Size HWT to 64.00m, HQ3 to 104.50m

Drillhole No.: DH14-056

Drill Type: Fraste DR238

Total Depth: 104.50 m

Elevation: 894.5 m

Azimuth , Inclination: 0 , -90

Page: 1 of 6

Date Started: 30 Oct 14

Date Completed: 2 Nov 14

Logged by: LEP/MAS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
			SAND (0 to 9.55) Trace silt, trace gravel, fine to medium grained, angular to subangular, poorly graded, non-plastic, greyish brown, very dense, massive, dry to moist.		SPT #1	72		13/14/12	26			
					SPT #2	100		19/50+	R			SPT refusal on coarse material
	890.0				SPT #3	100		26/46/50+	R			SPT refusal on coarse material
5					SPT #4	100		33/40/42	R			
					SPT #5	100		46/50+	R			SPT refusal on coarse material
	885.0				SPT #6	100		21/35/50+	R			SPT refusal on dense material Start injecting water for drilling
10			**SANDY SILT** (9.55 to 13.72) Trace clay, trace gravel, fine to medium grained, angular to subangular, poorly graded, high plasticity, brownish grey, very stiff, massive, moist.		SPT #7	100		18/23/35	58			
					SPT #8	100		10/29/43	72			
	880.0		**SILTY SAND** (13.72 to 18.29) Trace clay, trace gravel, fine grained, angular to subangular, poorly graded, high plasticity, very dense, massive, moist.		SPT #9	100		10/21/32	53			
15					SPT #10	74		16/28/43	71			
	875.0		**SANDY SILT** (18.29 to 24.43) Some clay, trace gravel, fine grained, angular to subangular, poorly graded, high plasticity, grey, very stiff, laminated, moist.		SPT #11	100		10/25/25	50			

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-56

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project
Contractor: Geotech Drilling Services Ltd.
Location: Truck Shop Area
Coordinates: 686,850 E , 5,609,386 N
Coordinate System: UTM NAD 83 Zone 10
Hole Size HWT to 64.00m, HQ3 to 104.50m

Drillhole No.: DH14-056
Drill Type: Fraste DR238
Total Depth: 104.50 m
Elevation: 894.5 m
Azimuth , Inclination: 0 , -90

Page: 2 of 6
Date Started: 30 Oct 14
Date Completed: 2 Nov 14
Logged by: LEP/MAS
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
			SANDY SILT (18.29 to 24.43) Some clay, trace gravel, fine grained, angular to subangular, poorly graded, high plasticity, grey, very stiff, laminated, moist.		SPT #12	100		20/26/39	65			
	870.0		**SILTY SAND** (24.43 to 39.62) Trace clay, trace gravel, fine to medium grained, angular to subangular, poorly graded, medium to high plasticity, very dense, laminated, moist.		SPT #13	100		16/22/38	60			
25					SPT #14	100		8/11/27	38			
	865.0				SPT #15	100		13/43/30	73			
30					SPT #16	100		13/25/35	60			
	860.0				SPT #17	100		18/21/25	46			
35												
	855.0				SPT #18	100		19/31/49	80			

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-56

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project
Contractor: Geotech Drilling Services Ltd.
Location: Truck Shop Area
Coordinates: 686,850 E , 5,609,386 N
Coordinate System: UTM NAD 83 Zone 10
Hole Size HWT to 64.00m, HQ3 to 104.50m

Drillhole No.: DH14-056
Drill Type: Fraste DR238
Total Depth: 104.50 m
Elevation: 894.5 m
Azimuth , Inclination: 0 , -90

Page: 3 of 6
Date Started: 30 Oct 14
Date Completed: 2 Nov 14
Logged by: LEP/MAS
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
			SILTY SAND (39.62 to 48.77) Some silt, trace gravel, fine to coarse grained, angular to subangular, poorly graded, non-plastic, greyish brown, loose, massive, wet.									
					SPT #19	100		10/37/50+	R			SPT refusal on dense material
45	850.0				SPT #20	100		8/24/30	54			
			SAND (48.77 to 61.6) Trace gravel, fine grained; subangular gravel, poorly graded; non-plastic, orangey brown, loose to compact, massive, wet.		SPT #21	79		4/10/17	27			
50	845.0				SPT #22	100		7/13/20	33			
55	840.0											SPT not performed due to heaving sands
	835.0											SPT not performed due to heaving sands

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-56

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project
Contractor: Geotech Drilling Services Ltd.
Location: Truck Shop Area
Coordinates: 686,850 E , 5,609,386 N
Coordinate System: UTM NAD 83 Zone 10
Hole Size HWT to 64.00m, HQ3 to 104.50m

Drillhole No.: DH14-056
Drill Type: Fraste DR238
Total Depth: 104.50 m
Elevation: 894.5 m
Azimuth , Inclination: 0 , -90

Date Started: 30 Oct 14
Date Completed: 2 Nov 14
Logged by: LEP/MAS
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
												SPT not performed due to heaving sands
			WEATHERED BEDROCK (61.6 to 64.04) Greenish grey, angular rock chips - bedrock contact at 61.6 m.									
	830.0		**IRON MASK HYBRID** (64.04 to 65.7) Greenish grey fault gouge, moderately to heavily weathered.	57	SPT #23	20		50+ / R1	R			SPT refusal on bedrock
65			**IRON MASK HYBRID** (65.7 to 100) Greenish grey, fine to coarse grained, equigranular, weak to medium strong, moderately weathered to fresh, massive; some healed joints throughout; calcite infilling along joints; quartz and calcite veins and veinlets throughout; chlorite alteration; trace sulphides.	73				R3				
				90				R3				
	825.0		**FRACTURED ZONE** (68.25 to 74.65) Highly fractured, greenish grey bedrock unit, weak.	79				R3				
70				87				R3				
				95				R3				
				99				R3				
	820.0			100				R3				
75				100				R3				
				97				R3				
	815.0			100				R3				

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-56

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project
Contractor: Geotech Drilling Services Ltd.
Location: Truck Shop Area
Coordinates: 686,850 E , 5,609,386 N
Coordinate System: UTM NAD 83 Zone 10
Hole Size HWT to 64.00m, HQ3 to 104.50m

Drillhole No.: DH14-056
Drill Type: Fraste DR238
Total Depth: 104.50 m
Elevation: 894.5 m
Azimuth , Inclination: 0 , -90

Page: 5 of 6
Date Started: 30 Oct 14
Date Completed: 2 Nov 14
Logged by: LEP/MAS
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
85	810.0		**IRON MASK HYBRID** (65.7 to 100) Greenish grey, fine to coarse grained, equigranular, weak to medium strong, moderately weathered to fresh, massive; some healed joints throughout; calcite infilling along joints; quartz and calcite veins and veinlets throughout; chlorite alteration; trace sulphides. **FRACTURED ZONE** (76 to 80.8) Highly fractured, greenish grey bedrock unit, weak.	100				R3				
				100				R4				
				100	UCS #1			R4				
				100				R4				
				100				R4				
				99				R4				
90	805.0			100				R4				
				99				R4				
				100				R4				
				100				R4				
95	800.0			100				R4				
				98	UCS #2			R4				
	795.0			100				R4				

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-56

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Truck Shop Area

Coordinates: 686,850 E , 5,609,386 N

Coordinate System: UTM NAD 83 Zone 10

Hole Size HWT to 64.00m, HQ3 to 104.50m

Drillhole No.: DH14-056

Drill Type: Fraste DR238

Total Depth: 104.50 m

Elevation: 894.5 m

Azimuth , Inclination: 0 , -90

Page: 6 of 6

Date Started: 30 Oct 14

Date Completed: 2 Nov 14

Logged by: LEP/MAS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - × (20 40 60 80)	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
			IRON MASK HYBRID (100 to 101.4) Highly fractured, greenish grey bedrock unit, weak, some fault gouge at (101 - 101.11 m).	93				R2				
			IRON MASK HYBRID (101.4 to 104.5) Greenish grey, fine to coarse grained, equigranular, medium strong, fresh, massive; some healed joints throughout; calcite infilling along joints; quartz and calcite veins and veinlets throughout; chlorite alteration; trace sulphides.	97				R4				
				100				R4				
105	790.0		End of Drillhole: 104.5 m Reached Target Depth									
110	785.0											
115	780.0											
	775.0											

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-56

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: EMRSF Water Management Pond

Coordinates: 687,035 E , 5,609,442 N

Coordinate System: UTM NAD 83 Zone 10

Hole Size HWT to 39.6m, HQ3 to 46.11m

Drillhole No.: DH14-057

Drill Type: Fraste DR238

Total Depth: 46.11 m

Elevation: 885.9 m

Azimuth , Inclination: 0 , -90

Page: 1 of 3

Date Started: 31 Oct 14

Date Completed: 1 Nov 14

Logged by: GNH/JAG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
0	885.0		**SANDY SILT** (0 to 7.6) Some gravel, clasts up to 1 cm, angular to subrounded, gap graded, brown with grey clasts, compact to dense, dry.		SPT #1	82		13/15/18	33			
					SPT #2	100		8/14/16	30			
5					SPT #3	86		10/19/33	52			
	880.0				SPT #4	100		11/22/41	63			
			CLAYEY SILT (7.6 to 16.72) Trace gravel, clasts up to 1 cm, subangular to subrounded, poorly graded, highly plasticity, brown, hard, moist.		SPT #5	49		9/29/50+	80			
10					SPT #6	100		9/18/26	44			
	875.0				SPT #7	100		14/19/30	49			
					SPT #8	100		13/24/30	54			
					SPT #9	100		5/16/40	56			Start injecting water for drilling
15					SPT #10	41		7/26/40	66			
	870.0		**CLAY** (16.72 to 24.32) Some silt, some gravel, clasts up to 1 cm, angular to subrounded, poorly graded, high plasticity, greyish-brown, wet.		SPT #11	100		13/23/24	47			

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-57

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project
Contractor: Geotech Drilling Services Ltd.
Location: EMRSF Water Management Pond
Coordinates: 687,035 E , 5,609,442 N
Coordinate System: UTM NAD 83 Zone 10
Hole Size HWT to 39.6m, HQ3 to 46.11m

Drillhole No.: DH14-057
Drill Type: Fraste DR238
Total Depth: 46.11 m
Elevation: 885.9 m
Azimuth , Inclination: 0 , -90

Page: 2 of 3
Date Started: 31 Oct 14
Date Completed: 1 Nov 14
Logged by: GNH/JAG
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
	865.0		**CLAY** (16.72 to 24.32) Some silt, some gravel, clasts up to 1 cm, angular to subrounded, poorly graded, high plasticity, greyish-brown, wet.		SPT #12	100		4/10/13	23			
25	860.0		**SANDY CLAY AND SILT** (24.32 to 30.4) Some gravel, fine to coarse grained, angular to subrounded, well graded, medium to high plasticity, medium greyish-brown, hard, laminated, wet.		SPT #13	90		3/6/11	17			
					SPT #14	100		9/20/26	46			
30	855.0		**CLAYEY SILT AND SAND** (30.4 to 36.5) Some gravel, fine to medium grained, subangular to subrounded, poorly graded, high plasticity, medium greyish-brown, dense, laminated, wet.		SPT #15	100		6/6/11	17			
					SPT #16	100		6/8/12	20			
35	850.0		**IRON MASK HYBRID** (36.5 to 46.11) Fine to coarse grained, medium grey, mottled, fresh to slightly weathered, moderate strength, veins of calcite and quartz with disseminated pyrite, slightly fractured.	104	SPT #17	100		20/50+	R			SPT refusal on bedrock
								R5				

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-57

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: EMRSF Water Management Pond

Coordinates: 687,035 E , 5,609,442 N

Coordinate System: UTM NAD 83 Zone 10

Hole Size HWT to 39.6m, HQ3 to 46.11m

Drillhole No.: DH14-057

Drill Type: Fraste DR238

Total Depth: 46.11 m

Elevation: 885.9 m

Azimuth , Inclination: 0 , -90

Page: 3 of 3

Date Started: 31 Oct 14

Date Completed: 1 Nov 14

Logged by: GNH/JAG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
	845.0		**IRON MASK HYBRID** (36.5 to 46.11) Fine to coarse grained, medium grey, mottled, fresh to slightly weathered, moderate strength, veins of calcite and quartz with disseminated pyrite, slightly fractured.	101				R5				
				101				R5				
				100				R5				
45				99				R5				
	840.0		End of Drillhole: 46.11 m Reached Target Depth									
50												
	835.0											
55												
	830.0											

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-57

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project
Contractor: Geotech Drilling Services Ltd.
Location: Primary Crusher Area
Coordinates: 685,080 E , 5,609,149 N
Coordinate System: UTM NAD 83 Zone 10
Hole Size HWT to 6.07m, HQ3 to 45.78m

Drillhole No.: DH14-058
Drill Type: Fraste DR238
Total Depth: 45.78 m
Elevation: 895.8 m
Azimuth , Inclination: 0 , -90

Page: 1 of 3
Date Started: 1 Nov 14
Date Completed: 2 Nov 14
Logged by: GNH/JAG
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	DRILLING NOTES
	895.0		**SILTY SAND** (0 to 3.04) Trace gravel, fine to medium grained, poorly graded, angular to subrounded, non-plastic, medium orange-brown, loose, massive, dry.		SPT #1	20		2/3/4	7		
			WEATHERED BEDROCK (3.04 to 6.07) Light brownish grey rock chips with sand - bedrock contact at 3.04 mbgs.		SPT #2	0		50+	R		SPT refusal on bedrock
5.0	890.0		**SUGARLOAF DIORITE** (6.07 to 13.75) Dark greenish grey, fine to coarse grained, massive, strong with several fracture zones, moderately weathered; FeO staining along fractures; weak chlorite alteration; calcite infill along joints and in fractures with trace dissolution weathering as vugs; trace disseminated sulphides.	97				R4			
				100				R4			
				100				R5			
10.0	885.0			99				R4			
				100				R4			
				100	UCS #1			R5			
15.0	880.0		**SUGARLOAF DIORITE** (13.75 to 45.78) Dark greenish grey, fine to coarse grained, massive, strong, moderately weathered; FeO staining along fractures; weak chlorite alteration; calcite infill along joints and in fractures with trace dissolution weathering as vugs; trace disseminated sulphides.	101				R5			
				101				R5			
				102				R5			
				100				R5			

GENERAL REMARKS:
No piezometer installation.

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-58

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL LOG - NO INSTALLATION, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Primary Crusher Area

Coordinates: 685,080 E , 5,609,149 N

Coordinate System: UTM NAD 83 Zone 10

Hole Size HWT to 6.07m, HQ3 to 45.78m

Drillhole No.: DH14-058

Drill Type: Fraste DR238

Total Depth: 45.78 m

Elevation: 895.8 m

Azimuth , Inclination: 0 , -90

Page: 2 of 3

Date Started: 1 Nov 14

Date Completed: 2 Nov 14

Logged by: GNH/JAG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - × (20 40 60 80)	DRILLING NOTES
	875.0		**SUGARLOAF DIORITE** (13.75 to 45.78) Dark greenish grey, fine to coarse grained, massive, strong, moderately weathered; FeO staining along fractures; weak chlorite alteration; calcite infill along joints and in fractures with trace dissolution weathering as vugs; trace disseminated sulphides.	102	UCS #2			R5			
				101				R5			
				100				R5			
25.0											
	870.0		**FRACTURE ZONE** (25.01 to 29.51) Moderately to highly fractured zone, some brecciation, vuggy calcite in fractures.	101				R5			
				100				R5			
				102				R5			
30.0											
	865.0			101				R5			
				96				R5			
				97				R5			
				101				R5			
35.0											
	860.0			98				R5			
				101				R5			
				100				R5			

GENERAL REMARKS:

No piezometer installation.

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-58

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL LOG - NO INSTALLATION, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project
Contractor: Geotech Drilling Services Ltd.
Location: Primary Crusher Area
Coordinates: 685,080 E , 5,609,149 N
Coordinate System: UTM NAD 83 Zone 10
Hole Size HWT to 6.07m, HQ3 to 45.78m

Drillhole No.: DH14-058
Drill Type: Fraste DR238
Total Depth: 45.78 m
Elevation: 895.8 m
Azimuth , Inclination: 0 , -90

Page: 3 of 3
Date Started: 1 Nov 14
Date Completed: 2 Nov 14
Logged by: GNH/JAG
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - × (20 40 60 80)	DRILLING NOTES
	855.0		**SUGARLOAF DIORITE** (13.75 to 45.78) Dark greenish grey, fine to coarse grained, massive, strong, moderately weathered; FeO staining along fractures; weak chlorite alteration; calcite infill along joints and in fractures with trace dissolution weathering as vugs; trace disseminated sulphides.	100				R6			
				100				R6			
				100				R5			
45.0				101	UCS #3			R5			
	850.0		End of Drillhole: 45.78 m Reached Target Depth								
50.0											
	845.0										
55.0											
	840.0										

GENERAL REMARKS:
No piezometer installation.

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-58

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL LOG - NO INSTALLATION, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project
Contractor: Geotech Drilling Services Ltd.
Location: Truck Shop Area
Coordinates: 686,636 E , 5,609,481 N
Coordinate System: UTM NAD 83 Zone 10
Hole Size HWT to 42.67m, HQ3 to 48.82m

Drillhole No.: DH14-059
Drill Type: Fraste DR238
Total Depth: 48.82 m
Elevation: 905.3 m
Azimuth , Inclination: 0 , -90

Page: 1 of 3
Date Started: 2 Nov 14
Date Completed: 3 Nov 14
Logged by: LEP/MAS
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	DRILLING NOTES
	905.0		**SAND** (0 to 4.57) Some silt, some gravel, fine to coarse grained, subangular to subrounded, well graded, non-plastic, greyish brown, loose, massive, dry to moist.		SPT #1	100		12/18/19	37		
					SPT #2	98		19/28/35	63		
5.0	900.0		**SANDY SILT** (4.57 to 12.8) Some multicoloured gravel, fine to coarse grained, angular to subrounded, well graded, medium to high plasticity, greyish brown, dense, massive, dry to moist.		SPT #3	100		29/50+	R		SPT refusal on coarse material
					SPT #4	0		50+	R		SPT refusal on coarse material
					SPT #5	100		15/50+	R		SPT refusal on coarse material
10.0	895.0				SPT #6	100		30/37/46	R		
					SPT #7	100		22/20/23	43		
					SPT #8	64		13/30/37	67		
			SILT (12.8 to 27.43) Some gravel, trace clay, trace sand, fine to medium grained, subangular to angular, well graded, medium to high plasticity, dense, massive, moist.		SPT #9	100		6/15/21	36		
15.0	890.0				SPT #10	100		20/26/36	62		
					SPT #11	100		4/6/13	19		

GENERAL REMARKS:
No piezometer installation.

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-59

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL LOG - NO INSTALLATION, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Truck Shop Area

Coordinates: 686,636 E , 5,609,481 N

Coordinate System: UTM NAD 83 Zone 10

Hole Size HWT to 42.67m, HQ3 to 48.82m

Drillhole No.: DH14-059

Drill Type: Fraste DR238

Total Depth: 48.82 m

Elevation: 905.3 m

Azimuth , Inclination: 0 , -90

Page: 2 of 3

Date Started: 2 Nov 14

Date Completed: 3 Nov 14

Logged by: LEP/MAS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	DRILLING NOTES
	885.0		**SILT** (12.8 to 27.43) Some gravel, trace clay, trace sand, fine to medium grained, subangular to angular, well graded, medium to high plasticity, dense, massive, moist.								
					SPT #12	100		13/36/47	83		
					SPT #13	100		16/41/37	78		
25.0	880.0										
			SILTY SAND (27.43 to 31.09) Trace gravel, fine to medium grained, subangular to angular, well graded, non-plastic, greyish brown, compact, massive, wet.		SPT #14	100		8/17/16	33		
30.0	875.0				SPT #15	25		12/12/16	28		
			SANDY SILT (31.09 to 41.5) Trace clay, trace grave, fine to medium grained, angular to subangular, well graded, low plasticity, greyish brown, very stiff, massive, moist.		SPT #16	100		5/11/13	24		
35.0	870.0				SPT #17	100		8/12/27	39		Start injecting water for drilling
					SPT #18	100		17/48/50+	R		SPT refusal on dense material

GENERAL REMARKS:

No piezometer installation.

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-59

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL LOG - NO INSTALLATION, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project
Contractor: Geotech Drilling Services Ltd.
Location: Truck Shop Area
Coordinates: 686,636 E , 5,609,481 N
Coordinate System: UTM NAD 83 Zone 10
Hole Size HWT to 42.67m, HQ3 to 48.82m

Drillhole No.: DH14-059
Drill Type: Fraste DR238
Total Depth: 48.82 m
Elevation: 905.3 m
Azimuth , Inclination: 0 , -90

Page: 3 of 3
Date Started: 2 Nov 14
Date Completed: 3 Nov 14
Logged by: LEP/MAS
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - × (20 40 60 80)	DRILLING NOTES
	865.0										
			WEATHERED BEDROCK (41.5 to 42.67) Grey sand and bedrock chips from ODEX drilling - bedrock contact at 41.5 mbgs.	80				R4			
45.0	860.0		**IRON MASK HYBRID** (42.67 to 48.82) Grey to greenish grey, fine to coarse grained, inequigranular, porphyritic, strong with some local, moderately fractured zones, moderately weathered with some FeO staining and trace clay infill along some joints; quartz and calcite veins and veinlets throughout.	97				R4			
				100				R4			
				88				R4			
				100				R4			
50.0	855.0		End of Drillhole: 48.82 m Reached Target Depth								
55.0	850.0										

GENERAL REMARKS:
No piezometer installation.

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-59

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL LOG - NO INSTALLATION, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Primary Crusher Area

Coordinates: 685,215 E , 5,609,206 N

Coordinate System: UTM NAD 83 Zone 10

Hole Size HWT to 1.2m, HQ3 to 41.07m

Drillhole No.: DH14-060

Drill Type: Fraste DR238

Total Depth: 41.07 m

Elevation: 914.3 m

Azimuth , Inclination: 0 , -90

Page: 1 of 3

Date Started: 2 Nov 14

Date Completed: 3 Nov 14

Logged by: GNH/JAG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
0			**SANDY GRAVEL** (0 to 0.3) Trace silt; gravel is medium to coarse grained, poorly graded, angular to sub-angular; silt is non-plastic, light to medium grey, dry.									
			SUGARLOAF DIORITE (0.3 to 1.2) Light to medium grey, angular rock chips form ODEX - bedrock contact at 0.3 mbgs.	87				R5				No SPT conducted due to shallow bedrock
			SUGARLOAF DIORITE (1.2 to 24.2) Dark grey, fine to coarse grained, mottled, massive, strong, moderately weathered with FeO staining along fractures; minor fracturing; some calcite and quartz veinlets.	100				R5				
	910.0			100				R5				
5				102				R5				
				101				R5				
	905.0			100				R5				
10				100				R5				
				100				R5				
	900.0			102				R5				
15				101				R5				
				102				R5				
				101				R5				
	895.0			99				R5				

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-60

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project
Contractor: Geotech Drilling Services Ltd.
Location: Primary Crusher Area
Coordinates: 685,215 E , 5,609,206 N
Coordinate System: UTM NAD 83 Zone 10
Hole Size HWT to 1.2m, HQ3 to 41.07m

Drillhole No.: DH14-060
Drill Type: Fraste DR238
Total Depth: 41.07 m
Elevation: 914.3 m
Azimuth , Inclination: 0 , -90

Page: 2 of 3
Date Started: 2 Nov 14
Date Completed: 3 Nov 14
Logged by: GNH/JAG
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
			SUGARLOAF DIORITE (1.2 to 24.2) Dark grey, fine to coarse grained, mottled, massive, strong, moderately weathered with FeO staining along fractures; minor fracturing; some calcite and quartz veinlets.	97				R5				
				102				R5				
				100				R5				
	890.0		**SUGARLOAF DIORITE** (24.2 to 25.67) Dark grey, fine to coarse grained, mottled, massive, strong, moderately weathered with FeO staining along fractures; moderately fractured over this interval with local rubble zones; some calcite and quartz veinlets.	2				R5				
25			**SUGARLOAF DIORITE** (25.67 to 41.07) Dark grey, fine to coarse grained, mottled, massive, strong, moderately weathered with FeO staining along fractures; minor fracturing; some calcite and quartz veinlets.	100				R5				
				100	UCS #1			R5				
	885.0			101				R5				
30				99				R5				
				101				R5				
	880.0			99				R5				
35				99				R5				
				100				R5				
					UCS #2							
	875.0			98				R5				

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-60

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Primary Crusher Area

Coordinates: 685,215 E , 5,609,206 N

Coordinate System: UTM NAD 83 Zone 10

Hole Size HWT to 1.2m, HQ3 to 41.07m

Drillhole No.: DH14-060

Drill Type: Fraste DR238

Total Depth: 41.07 m

Elevation: 914.3 m

Azimuth , Inclination: 0 , -90

Page: 3 of 3

Date Started: 2 Nov 14

Date Completed: 3 Nov 14

Logged by: GNH/JAG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
				100				R5				
			End of Drillhole: 41.07 m Reached Target Depth									
45	870.0											
50	865.0											
55	860.0											
	855.0											

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-60

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Primary Crusher Area

Coordinates: 684,973 E , 5,609,257 N

Coordinate System: UTM NAD 83 Zone 10

Hole Size HWT to 1.44m, HQ3 to 41.32m

Drillhole No.: DH14-061

Drill Type: Fraste DR238

Total Depth: 41.32 m

Elevation: 912.2 m

Azimuth , Inclination: 0 , -90

Page: 1 of 3

Date Started: 4 Nov 14

Date Completed: 4 Nov 14

Logged by: GNH/JAG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - × (20 40 60 80)	DRILLING NOTES
			SANDY SILT (0 to 0.7) Trace gravel, fine grained, poorly graded, angular to subrounded, non-plastic, light brown, loose, dry; trace organics.								
	910.0		**SUGARLOAF DIORITE** (0.7 to 1.44) Light to medium grey, angular rock chips form ODEX - bedrock contact at 0.7 mbgs.	60				R4			No SPT conducted due to shallow bedrock
			SUGARLOAF DIORITE (1.44 to 4.02) Light to medium grey, fine to medium grained, inequigranular, strong, moderately weathered, highly fractured; FeO staining along joints and; quartz and calcite veins and veinlets throughout.	70				R4			
5.0				100				R4			
	905.0		**SUGARLOAF DIORITE** (4.02 to 41.32) Medium grey, fine to medium grained, inequigranular, strong to very strong, massive, slightly weathered; healed joints throughout; quartz and calcite veinlets; minor FeO staining.	100				R4			
				100	UCS #1			R5			
10.0				97				R5			
	900.0			100				R5			
				100				R5			
15.0				100				R5			
				99				R5			
	895.0			101				R5			
				100				R5			

GENERAL REMARKS:

No piezometer installation.

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-61

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL LOG - NO INSTALLATION, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Primary Crusher Area

Coordinates: 684,973 E , 5,609,257 N

Coordinate System: UTM NAD 83 Zone 10

Hole Size HWT to 1.44m, HQ3 to 41.32m

Drillhole No.: DH14-061

Drill Type: Fraste DR238

Total Depth: 41.32 m

Elevation: 912.2 m

Azimuth , Inclination: 0 , -90

Page: 2 of 3

Date Started: 4 Nov 14

Date Completed: 4 Nov 14

Logged by: GNH/JAG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - × (20 40 60 80)	DRILLING NOTES
			SUGARLOAF DIORITE (4.02 to 41.32) Medium grey, fine to medium grained, inequigranular, strong to very strong, massive, slightly weathered; healed joints throughout; quartz and calcite veinlets; minor FeO staining.	100				R5			
	890.0			100				R5			
				100				R5			
25.0				99				R5			
	885.0			98				R5			
				100				R5			
30.0				97				R5			
				100				R5			
	880.0			98				R5			
				100				R5			
35.0				102				R5			
	875.0			100				R5			
				100				R5			

GENERAL REMARKS:

No piezometer installation.

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-61

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL LOG - NO INSTALLATION, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project
Contractor: Geotech Drilling Services Ltd.
Location: Primary Crusher Area
Coordinates: 684,973 E , 5,609,257 N
Coordinate System: UTM NAD 83 Zone 10
Hole Size HWT to 1.44m, HQ3 to 41.32m

Drillhole No.: DH14-061
Drill Type: Fraste DR238
Total Depth: 41.32 m
Elevation: 912.2 m
Azimuth , Inclination: 0 , -90

Page: 3 of 3
Date Started: 4 Nov 14
Date Completed: 4 Nov 14
Logged by: GNH/JAG
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	DRILLING NOTES
				100				R5			
45.0	870.0		End of Drillhole: 41.32 m Reached Target Depth								
50.0	865.0										
55.0	860.0										
	855.0										

GENERAL REMARKS:
No piezometer installation.

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-61

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL LOG - NO INSTALLATION, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: TSF Basin - Looking for Fault

Coordinates: 684,738 E , 5,606,037 N

Coordinate System: UTM NAD 83 Zone 10

Hole Size HWT to 30.48m, HQ3 to 50.50m

Drillhole No.: DH14-062

Drill Type: Fraste DR238

Total Depth: 50.50 m

Elevation: 987.2 m

Azimuth , Inclination: 0 , -90

Page: 1 of 3

Date Started: 4 Nov 14

Date Completed: 6 Nov 14

Logged by: LEP/MAS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
			GRAVELLY SAND (0 to 2.13) Fine to medium grained, subangular to subrounded, well graded, non-plastic, medium brown, loose, massive, dry.		SPT #1	15		2/2/3	5			
	985.0		**SAND** (2.13 to 6.71) Some silt, trace gravel. Fine grained, subangular to subrounded, poorly graded, low plasticity, loose, massive, moist.		SPT #2	46		1/1/1	2			
5					SPT #3	100		11/14/26	40			
					SPT #4	100		23/39/47	R			
	980.0		**SAND AND GRAVEL** (6.71 to 9.14) Fine to coarse grained, angular to subangular, well graded, non-plastic, greyish brown with some iron oxide staining, very dense, massive, moist.		SPT #5	100		31/49/50+	R			SPT refusal on dense material
			SAND (9.14 to 10.67) Trace silt, trace gravel. Fine grained, angular, poorly graded, non-plastic, medium brown, dense, massive, moist.		SPT #6	100		25/50+	R			SPT refusal on dense material
10			**SAND AND GRAVEL** (10.67 to 29.25) Some silt. Fine to coarse grained, angular to subangular, well graded, medium brown with grey gravel, very dense, massive, wet.		SPT #7	100		15/21/50+	R			SPT refusal on dense material
	975.0				SPT #8	100		25/50/50+	R			SPT refusal on dense material
					SPT #9	100		30/50+	R			Start injecting water for drilling SPT refusal on coarse/dense material
15					SPT #10	91		43/50+	R			SPT refusal on coarse material
	970.0				SPT #11	89		14/22/26	48			

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-62

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project
Contractor: Geotech Drilling Services Ltd.
Location: TSF Basin - Looking for Fault
Coordinates: 684,738 E , 5,606,037 N
Coordinate System: UTM NAD 83 Zone 10
Hole Size HWT to 30.48m, HQ3 to 50.50m

Drillhole No.: DH14-062
Drill Type: Fraste DR238
Total Depth: 50.50 m
Elevation: 987.2 m
Azimuth , Inclination: 0 , -90

Page: 2 of 3
Date Started: 4 Nov 14
Date Completed: 6 Nov 14
Logged by: LEP/MAS
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
			SAND AND GRAVEL (10.67 to 29.25) Some silt. Fine to coarse grained, angular to subangular, well graded, medium brown with grey gravel, very dense, massive, wet.		SPT #12	100		21/43/50+	R			SPT refusal on coarse material
	965.0				SPT #13	100		17/38/50+	R			SPT refusal on coarse/dense material
25												
	960.0				SPT #14	82		12/36/35	71			
30			**MUDSTONE** (29.25 to 30.71) Dark grey to black rock chips from ODEX drilling - bedrock at 29.25 mbgs.									
			MUDSTONE (30.71 to 50.5) Dark grey, fine grained, massive, weak, slightly weathered to unweathered; some local fracture zones; some clay and calcite infill along joints and fractures; calcite veinlets throughout.	100				R2				
	955.0			100				R2				
				100				R2				32.34 - 38.50 m - Lugeon Packer Test #1 - k = 4E-09 m/s
35				100				R2				
				100				R2				
	950.0			100				R2				
				98				R3				38.40 - 44.50 m - Lugeon Packer Test #2 - no take

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-62

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

PAGE B-1104

M:\1\101\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\101\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: TSF Basin - Looking for Fault

Coordinates: 684,738 E , 5,606,037 N

Coordinate System: UTM NAD 83 Zone 10

Hole Size HWT to 30.48m, HQ3 to 50.50m

Drillhole No.: DH14-062

Drill Type: Fraste DR238

Total Depth: 50.50 m

Elevation: 987.2 m

Azimuth , Inclination: 0 , -90

Page: 3 of 3

Date Started: 4 Nov 14

Date Completed: 6 Nov 14

Logged by: LEP/MAS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - × (20 40 60 80)	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
			MUDSTONE (30.71 to 50.5) Dark grey, fine grained, massive, weak, slightly weathered to unweathered; some local fracture zones; some clay and calcite infill along joints and fractures; calcite veinlets throughout.	100				R3				
	945.0			100				R2				
				100	UCS #1			R2				
45				100				R3				44.65 - 50.50 m - Lugeon Packer Test #3 - no take
	940.0			100				R3				
				100				R3				
50				71				R3				
			End of Drillhole: 50.5 m Reached Target Depth									
	935.0											
55												
	930.0											

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-62

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Potential Rock Quarry

Coordinates: 684,877 E , 5,609,154 N

Coordinate System: UTM NAD 83 Zone 10

Hole Size HWT to 5.4m, HQ3 to 35.26m

Drillhole No.: DH14-063

Drill Type: Fraste DR238

Total Depth: 35.26 m

Elevation: 923.4 m

Azimuth , Inclination: 0 , -90

Page: 1 of 2

Date Started: 5 Nov 14

Date Completed: 5 Nov 14

Logged by: GNH/JAG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	DRILLING NOTES
			SANDY, GRAVELLY SILT (0 to 3.04) Gravel is fine to coarse grained, well graded, angular to subangular; silt is low plasticity, medium brown, dense, massive, moist.		SPT #1	80		9/18/23	41		
	920.0		**GRAVELLY SILT** (3.04 to 5.2) Some sand; fine to coarse grained, well graded, low plasticity, medium brown and orange, dense, massive, moist.		SPT #2	52		10/15/25	40		
5.0					SPT #3	86		6/15/15	30		
			SUGARLOAF DIORITE (5.2 to 35.26) Dark greenish grey, fine to coarse grained, mottled, massive, very strong, slightly weathered; some FeO staining along joints and fractures; minor fracturing; chlorite and epidote alteration; trace calcite veinlets; trace sulphides.	100				R5			
				100				R5			
	915.0			101				R5			
10.0				98				R5			
				91				R5			
				97	UCS #1			R5			
	910.0			100				R5			
15.0				99				R5			
				97				R5			
	905.0			100				R5			

GENERAL REMARKS:

No piezometer installation.

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-63

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL LOG - NO INSTALLATION, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Potential Rock Quarry

Coordinates: 684,877 E , 5,609,154 N

Coordinate System: UTM NAD 83 Zone 10

Hole Size HWT to 5.4m, HQ3 to 35.26m

Drillhole No.: DH14-063

Drill Type: Fraste DR238

Total Depth: 35.26 m

Elevation: 923.4 m

Azimuth , Inclination: 0 , -90

Page: 2 of 2

Date Started: 5 Nov 14

Date Completed: 5 Nov 14

Logged by: GNH/JAG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - × (20 40 60 80)	DRILLING NOTES
0	900.0		**SUGARLOAF DIORITE** (5.2 to 35.26) Dark greenish grey, fine to coarse grained, mottled, massive, very strong, slightly weathered; some FeO staining along joints and fractures; minor fracturing; chlorite and epidote alteration; trace calcite veinlets; trace sulphides.	100				R5			
				101				R5			
				99				R5			
25.0				100				R5			
	895.0			100				R5			
				100				R5			
30.0				99				R5			
				100				R5			
	890.0			99				R5			
35.0				100	UCS #2			R5			
			End of Drillhole: 35.26 m Reached Target Depth								
	885.0										

GENERAL REMARKS:

No piezometer installation.

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-63

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL LOG - NO INSTALLATION, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: SMSRF

Coordinates: 685,712 E , 5,607,321 N

Coordinate System: UTM NAD 83 Zone 10

Hole Size HWT to 45.6m, HQ3 to 51.86m

Drillhole No.: DH14-064

Drill Type: Fraste DR238

Total Depth: 51.86 m

Elevation: 1004.9 m

Azimuth , Inclination: 0 , -90

Page: 1 of 3

Date Started: 6 Nov 14

Date Completed: 8 Nov 14

Logged by: GNH/JAG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
			SILT (0 to 1.52) Some sand and trace gravel, fine to coarse grained, poorly graded, non-plastic, brown, loose, dry, trace organics.									
			SANDY SILT (1.52 to 6.08) Some gravel (clasts up to 2cm), angular to subrounded, non-plastic to low plasticity, well graded, brown with grey clasts, loose, dry.		SPT #1	83		7/47/31	78			
					SPT #2	59		11/14/14	28			
5	1000.0				SPT #3	84		8/13/20	33			
			SILT AND SAND (6.08 to 7.6) Some gravel (clasts up to 2cm), angular to subrounded, non-plastic, loose, brown with grey clasts.		SPT #4	100		10/14/22	36			
			SILT (7.6 to 9.12) Some sand and trace gravel (clasts up to 2cm), angular to subrounded, non-plastic, loose, light brown to brown, slight moisture.		SPT #5	100		12/20/25	45			
					SPT #6	93		24/50+	R			SPT refusal on coarse material
10	995.0		**SAND** (9.12 to 10.64) Some silt and trace gravel (clasts up to 1cm), subrounded, poorly graded, non-plastic, loose, slightly moist.		SPT #7	100		6/21/22	43			
			SILTY SAND (10.64 to 16.72) Some gravel, fine to coarse grained, angular to subrounded, poorly graded, non-plastic, medium greyish-brown, dense, massive, wet.		SPT #8	100		10/18/24	42			
					SPT #9	90		20/36/47	R			
15	990.0				SPT #10	92		13/19/27	46			
			SANDY CLAY AND SILT (16.72 to 25.84) Some gravel, fine to coarse grained, angular to subrounded, poorly graded, medium plasticity, medium greyish-brown, very firm, laminated, wet.		SPT #11	82		8/13/21	34			

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-64

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: SMSRF

Coordinates: 685,712 E , 5,607,321 N

Coordinate System: UTM NAD 83 Zone 10

Hole Size HWT to 45.6m, HQ3 to 51.86m

Drillhole No.: DH14-064

Drill Type: Fraste DR238

Total Depth: 51.86 m

Elevation: 1004.9 m

Azimuth , Inclination: 0 , -90

Page: 2 of 3

Date Started: 6 Nov 14

Date Completed: 8 Nov 14

Logged by: GNH/JAG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
			SANDY CLAY AND SILT (16.72 to 25.84) Some gravel, fine to coarse grained, angular to subrounded, poorly graded, medium plasticity, medium greyish-brown, very firm, laminated, wet.									
					SPT #12	100		8/18/24	42			
25	980.0				SPT #13	100		3/8/12	20			
			SILTY, SANDY GRAVEL (25.84 to 28.88) Fine to coarse grained, angular to subrounded, well graded, non-plastic, medium brownish-grey, dense, massive, wet.									
					SPT #14	82		13/26/33	59			
30	975.0		**CLAY AND SILT** (28.88 to 43) Some sand, trace gravel, fine grained, poorly graded, high plasticity, medium greyish brown, compact, wet.		SPT #15	100		5/11/16	27			
					SPT #16	100		4/9/13	22			
35	970.0				SPT #17	100		10/18/23	41			
					SPT #18	100		8/10/10	20			

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-64

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project
Contractor: Geotech Drilling Services Ltd.
Location: SMSRF
Coordinates: 685,712 E , 5,607,321 N
Coordinate System: UTM NAD 83 Zone 10
Hole Size HWT to 45.6m, HQ3 to 51.86m

Drillhole No.: DH14-064
Drill Type: Fraste DR238
Total Depth: 51.86 m
Elevation: 1004.9 m
Azimuth , Inclination: 0 , -90

Page: 3 of 3
Date Started: 6 Nov 14
Date Completed: 8 Nov 14
Logged by: GNH/JAG
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	INSTRUMENTATION / WELL DETAILS	DRILLING NOTES
		CLAY AND SILT (28.88 to 43) Some sand, trace gravel, fine grained, poorly graded, high plasticity, medium greyish brown, compact, wet.									
				SPT #19	100		8/19/33	52			
		WEATHERED BEDROCK (43 to 45.6) Medium grey, medium grained sand and rock chips from ODEX drilling - bedrock at 43.0 mbgs.									
45	960.0	**VOLCANICLASTIC** (45.6 to 48.86) Dark greyish green, fine to medium grained, mottled, massive, strong, fresh to slightly weathered; calcite veinlets throughout rock; minor fracturing.		SPT #20	0		50+	R			SPT refusal on bedrock
			94				R5				
			95				R5				
		SANDSTONE (48.86 to 50.09) Dark greenish grey, fine grained, strong, slightly weathered; many calcite veinlets; calcite and chlorite along fractures; chlorite alteration.	100				R5				
50	955.0	**VOLCANICLASTIC** (50.09 to 50.87) Dark greyish green, fine to medium grained, mottled, massive, strong, fresh to slightly weathered; calcite veinlets throughout rock; minor fracturing.	93				R5				
		SANDSTONE (50.87 to 51.86) Dark greenish grey, fine grained, strong, slightly weathered; many calcite veinlets; calcite and chlorite along fractures; chlorite alteration.									
55	950.0	End of Drillhole: 51.86 m Reached Target Depth									

GENERAL REMARKS:

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-64

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL DRILLHOLE LOG, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Potential Borrow Area

Coordinates: 684,995 E , 5,608,807 N

Coordinate System: UTM NAD 83 Zone 10

Hole Size HWT to 13.62m, HQ3 to 20.29m

Drillhole No.: DH14-065

Drill Type: Fraste DR238

Total Depth: 20.29 m

Elevation: 907.2 m

Azimuth , Inclination: 0 , -90

Page: 1 of 2

Date Started: 5 Nov 14

Date Completed: 6 Nov 14

Logged by: LEP/MAS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	DRILLING NOTES
			SILTY SAND (0 to 4.57) Some gravel. Fine to medium grained, angular to subangular, well graded, low plasticity, brown, compact, massive, moist.								
	905.0				SPT #1	3		10/25/30	55		
					SPT #2	87		12/17/16	33		
5.0			**SANDY SILT** (4.57 to 7.62) Some gravel, trace clay. Fine to coarse grained, angular to subrounded, well graded, low plasticity, brown with slightly weathered clasts, dense, massive, moist.		SPT #3	100		7/9/11	20		
					SPT #4	87		6/12/13	25		
	900.0		**SILTY SAND** (7.62 to 10.67) Some gravel. Fine to coarse grained, subangular to subrounded, well graded, low plasticity, grey with some slightly weathered clasts, dense, massive, moist.		SPT #5	77		7/16/27	43		
10.0					SPT #6	100		11/23/23	46		
			SILTY GRAVEL (10.67 to 11.43) Some sand. Fine to coarse grained, subangular to subrounded, well graded, low plasticity, brown with light grey clasts, dense, massive, moist.		SPT #7	61		37/12/24	36		
	895.0		**BEDROCK** (11.43 to 13.62) Grey, angular rock chips from ODEX drilling - bedrock at 11.43 mbgs.								
			VOLCANICLASTIC (13.62 to 20.29) Grey, fine to coarse grained, equigranular, porphyritic, medium strong, fresh to slightly weathered; some calcite veins and veinlets throughout.	55				R3			
15.0				100	UCS #1			R3			
			BROKEN ZONE (16.35 to 16.6) Highly fractured with some clay infill.	99				R3			
	890.0			100				R3			
				100				R3			

GENERAL REMARKS:

No piezometer installation.

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-65

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL LOG - NO INSTALLATION, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Potential Borrow Area

Coordinates: 684,995 E , 5,608,807 N

Coordinate System: UTM NAD 83 Zone 10

Hole Size HWT to 13.62m, HQ3 to 20.29m

Drillhole No.: DH14-065

Drill Type: Fraste DR238

Total Depth: 20.29 m

Elevation: 907.2 m

Azimuth , Inclination: 0 , -90

Page: 2 of 2

Date Started: 5 Nov 14

Date Completed: 6 Nov 14

Logged by: LEP/MAS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	DRILLING NOTES
			End of Drillhole: 20.29 m Reached Target Depth								
	885.0										
25.0											
	880.0										
30.0											
	875.0										
35.0											
	870.0										

GENERAL REMARKS:

No piezometer installation.

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-65

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL LOG - NO INSTALLATION, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Potential Rock Quarry

Coordinates: 683,958 E , 5,608,409 N

Coordinate System: UTM NAD 83 Zone 10

Hole Size HWT to 4.07m, HQ3 to 20.15m

Drillhole No.: DH14-066

Drill Type: Fraste DR238

Total Depth: 20.15 m

Elevation: 961.3 m

Azimuth , Inclination: 0 , -90

Page: 1 of 2

Date Started: 7 Nov 14

Date Completed: 8 Nov 14

Logged by: LEP/MAS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - × (20 40 60 80)	DRILLING NOTES
	960.0		**SAND** (0 to 1.52) Fine to coarse grained, poorly graded, light brown, compact, massive, dry.								
			GRAVELLY SAND (1.52 to 3.08) Trace silt, fine to coarse grained, angular to subangular, well graded, greyish brown, dense, massive, dry.		SPT #1	64		17/17/31	48	×	
			BEDROCK (3.08 to 4.07) Grey, angular rock chips and sand from ODEX drilling - bedrock at 3.08 mbgs		SPT #2	60		50+	R		SPT refusal on bedrock
5.0	955.0		**VOLCANICLASTIC** (4.07 to 10.51) Medium grey, fine to medium grained, medium strong, slightly weathered, porphyritic; local zones of highly fractured rock; FeO and calcite infilling along joints and fractures; trace calcite veinlets.	85				R5			
				97				R5			
				100				R4			
				98				R4			
10.0				100				R3			
	950.0		**VOLCANICLASTIC** (10.51 to 20.15) Orangey white to light grey, fine to coarse grained, medium strong to strong, slightly to moderately weathered; moderately top highly fractured; FeO, calcite and clay infill along joints and fractures; FeO staining pervasive throughout rock.	100				R3			
				97	UCS #1			R3			
15.0				100				R4			
	945.0			100				R4			
				100				R4			
				98				R3			

GENERAL REMARKS:

No piezometer installation.

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-66

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL LOG - NO INSTALLATION, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Potential Rock Quarry

Coordinates: 683,958 E , 5,608,409 N

Coordinate System: UTM NAD 83 Zone 10

Hole Size HWT to 4.07m, HQ3 to 20.15m

Drillhole No.: DH14-066

Drill Type: Fraste DR238

Total Depth: 20.15 m

Elevation: 961.3 m

Azimuth , Inclination: 0 , -90

Page: 2 of 2

Date Started: 7 Nov 14

Date Completed: 8 Nov 14

Logged by: LEP/MAS

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	DRILLING NOTES
			End of Drillhole: 20.15 m Reached Target Depth								
	940.0										
25.0											
	935.0										
30.0											
	930.0										
35.0											
	925.0										

GENERAL REMARKS:

No piezometer installation.

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-66

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL LOG - NO INSTALLATION, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project
Contractor: Geotech Drilling Services Ltd.
Location: Potential Borrow Area
Coordinates: 685,279 E , 5,607,578 N
Coordinate System: UTM NAD 83 Zone 10
Hole Size HWT to 34.96m, HQ3 to 39.86m

Drillhole No.: DH14-067
Drill Type: Fraste DR238
Total Depth: 39.86 m
Elevation: 1007.2 m
Azimuth , Inclination: 0 , -90

Page: 1 of 3
Date Started: 8 Nov 14
Date Completed: 9 Nov 14
Logged by: GNH/JAG
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - 20 40 60 80	DRILLING NOTES
			SANDY SILT (0 to 2.13) Some gravel, fine to coarse grained, angular to subrounded, well graded, low plasticity, brown, compact, massive, dry.		SPT #1	100		21/21/17	38		
	1005.0		**SILTY SAND** (2.13 to 4.56) Some gravel, fine to coarse grained, angular to subrounded, well graded, non-plastic, greyish brown, compact, massive, dry.		SPT #2	87		20/29/31	60		
5.0			**SANDY SILT** (4.56 to 7.6) Some gravel, fine to medium grained, angular to subrounded, well graded, non-plastic, brown and grey, compact to dense, massive, dry.		SPT #3	0		15/26/30	56		
					SPT #4	95		15/21/25	46		
	1000.0		**SILTY SAND** (7.6 to 12.77) Some gravel, fine to coarse grained, subangular to subrounded, well graded, non-plastic, medium brown, dense, massive, moist to wet.		SPT #5	92		12/38/50+	R		SPT refusal on coarse/dense material
					SPT #6	81		10/24/36	60		
10.0					SPT #7	100		21/27/36	63		Start injecting water for drilling
	995.0				SPT #8	93		8/24/32	56		
			SILT AND SAND (12.77 to 19.76) Trace gravel, fine grained, poorly graded, medium plasticity, medium greyish brown, compact, laminated, wet.		SPT #9	100		10/32/38	70		
15.0					SPT #10	100		7/14/15	29		
	990.0				SPT #11	100		5/20/19	39		

GENERAL REMARKS:
No piezometer installation.

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-67

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL LOG - NO INSTALLATION, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project
Contractor: Geotech Drilling Services Ltd.
Location: Potential Borrow Area
Coordinates: 685,279 E , 5,607,578 N
Coordinate System: UTM NAD 83 Zone 10
Hole Size HWT to 34.96m, HQ3 to 39.86m

Drillhole No.: DH14-067
Drill Type: Fraste DR238
Total Depth: 39.86 m
Elevation: 1007.2 m
Azimuth , Inclination: 0 , -90

Page: 2 of 3
Date Started: 8 Nov 14
Date Completed: 9 Nov 14
Logged by: GNH/JAG
Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - × (20 40 60 80)	DRILLING NOTES
			GRAVELLY SAND (19.76 to 21.28) Trace silt, medium to coarse grained, angular to subrounded, poorly graded, medium brownish grey, compact, massive, wet.		SPT #12	70		12/50+	R		SPT refusal on coarse material
	985.0		**SANDY CLAY AND SILT** (21.28 to 24.32) Some gravel, fine to coarse grained, subangular to subrounded, poorly graded, medium plasticity, medium greyish brown, stiff, massive, wet.								
25.0			**SANDY SILT** (24.32 to 34) Some gravel, fine to coarse grained, subangular to subrounded, poorly graded, medium plasticity, medium greyish brown, firm, massive, wet.		SPT #13	77		4/14/31	45		
	980.0				SPT #14	100		7/14/22	36		
30.0					SPT #15	100		9/18/35	53		
	975.0				SPT #16	79		8/28/29	57		
35.0			**VOLCANICLASTIC** (34 to 38) Dark greenish grey, fine to coarse grained, inequigranular, strong, slightly weathered; moderately fractured; some FeO staining along joints and fractures; quartz and calcite blebs and veinlets throughout rock; some healed joints; trace dissolution weathering in calcite.	98				R5			
				100				R5			
	970.0		**FAULT ZONE** (37.43 to 38) Highly fractured rock with brown clayey infill; moderately weathered.	102				R5			
			VOLCANICLASTIC (38 to 39.86) Dark greenish grey, fine to coarse grained,	99				R5			

GENERAL REMARKS:
No piezometer installation.

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-67

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL LOG - NO INSTALLATION, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

Project: Ajax Project

Contractor: Geotech Drilling Services Ltd.

Location: Potential Borrow Area

Coordinates: 685,279 E , 5,607,578 N

Coordinate System: UTM NAD 83 Zone 10

Hole Size HWT to 34.96m, HQ3 to 39.86m

Drillhole No.: DH14-067

Drill Type: Fraste DR238

Total Depth: 39.86 m

Elevation: 1007.2 m

Azimuth , Inclination: 0 , -90

Page: 3 of 3

Date Started: 8 Nov 14

Date Completed: 9 Nov 14

Logged by: GNH/JAG

Reviewed by: JAS

DEPTH - (m)	ELEVATION - (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	RUN RECOVERY (%)	SAMPLE NO.	SAMPLE REC. (%)	SAMPLE TYPE	UCS GRADE / BLOW COUNTS (PER 6")	SPT 'N' VALUE	RQD / SPT TEST 'N' VALUES - × (20 40 60 80)	DRILLING NOTES
			inequigranular, strong, slightly weathered; moderately fractured; some FeO staining along joints and fractures; quartz and calcite blebs and veinlets throughout rock; some healed joints; trace dissolution weathering in calcite.								
			End of Drillhole: 39.86 m Reached Target Depth								
45.0	965.0										
50.0	960.0										
55.0	955.0										
	950.0										

GENERAL REMARKS:

No piezometer installation.

KGHM Ajax Mining Inc.
Ajax Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
VA101-00246/26	11	0

FIGURE C1-67

Logging conducted according to a combination of the ASTM 2488 standard and the Canadian Foundation Engineering Manual, 4th Edition, 2006.

M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\PROJECT\AJAX DRILLHOLES DH14-040 TO 067 REPORT 11.GPJ
M:\1\01\00246\26\A\DATA\TASK 200 - GEOTECHNICAL SITE INVESTIGATION\SI DATA WORK FILE\GINT\LIBRARY\KP LIB.GLB, GEOTECHNICAL LOG - NO INSTALLATION, 2014 KP DATA TEMPLATE REVB.GDT, 20-Mar-15

LIST OF ABBREVIATIONS

The abbreviations commonly employed on Records of Boreholes, on figures and in the text of the report are as follows:

I. SAMPLE TYPE

AS	Auger sample
BS	Block sample
CS	Chunk sample
DO	Drive open
DS	Denison type sample
FS	Foil sample
RC	Rock core
SC	Soil core
ST	Slotted tube
TO	Thin-walled, open
TP	Thin-walled, piston
WS	Wash sample

II. PENETRATION RESISTANCE

Standard Penetration Resistance (SPT), N:

The number of blows by a 63.5 kg. (140 lb.) hammer dropped 760 mm (30 in.) required to drive a 50 mm (2 in.) drive open sampler for a distance of 300 mm (12 in.)

Dynamic Cone Penetration Resistance; N_d:

The number of blows by a 63.5 kg (140 lb.) hammer dropped 760 mm (30 in.) to drive uncased a 50 mm (2 in.) diameter, 60° cone attached to "A" size drill rods for a distance of 300 mm (12 in.).

PH: Sampler advanced by hydraulic pressure
PM: Sampler advanced by manual pressure
WH: Sampler advanced by static weight of hammer
WR: Sampler advanced by weight of sampler and rod

Piezo-Cone Penetration Test (CPT)

A electronic cone penetrometer with a 60° conical tip and a project end area of 10 cm^2 pushed through ground at a penetration rate of 2 cm/s. Measurements of tip resistance (Q_t), porewater pressure (PWP) and friction along a sleeve are recorded electronically at 25 mm penetration intervals.

III. SOIL DESCRIPTION

(a) Cohesionless Soils

Density Index (Relative Density)	N Blows/300 mm or Blows/ft.
Very loose	0 to 4
Loose	4 to 10
Compact	10 to 30
Dense	30 to 50
Very dense	over 50

(b) Cohesive Soils

Consistency	c_u, s_u kPa	c_u, s_u psf
Very soft	0 to 12	0 to 250
Soft	12 to 25	250 to 500
Firm	25 to 50	500 to 1,000
Stiff	50 to 100	1,000 to 2,000
Very stiff	100 to 200	2,000 to 4,000
Hard	over 200	over 4,000

IV. SOIL TESTS

w	water content
w_p	plastic limit
w_l	liquid limit
C	consolidation (oedometer) test
CHEM	chemical analysis (refer to text)
CID	consolidated isotropically drained triaxial test[1]
CIU	consolidated isotropically undrained triaxial test with porewater pressure measurement[1]
D_R	relative density (specific gravity, G_s)
DS	direct shear test
M	sieve analysis for particle size
MH	combined sieve and hydrometer (H) analysis
MPC	Modified Proctor compaction test
SPC	Standard Proctor compaction test
OC	organic content test
SO_4	concentration of water-soluble sulphates
UC	unconfined compression test
UU	unconsolidated undrained triaxial test
V	field vane (LV-laboratory vane test)
γ	unit weight

Note: 1 Tests which are anisotropically consolidated prior to shear are shown as CAD, CAU.

PROJECT: AJAX Mine

RECORD OF BOREHOLE: BH 10-1

SHEET 1 OF 1

LOCATION: N 5611931.00 ;E 679001.00

BORING DATE: 2/4/2011

DATUM: NAD 83

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. +, rem V. ⊕, Q - ●, U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp, W, Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE									
0	Geotech Drilling Ltd: B-54 Odex Downhole Hammer	Compact, brown, SILT, some sand, some gravel, containing roots		0.00	1	DO	25				
1		Very dense, brown, SAND, some gravel, some silt, cobbles present (TILL)		0.61	2	DO	53				
		Very dense, brown, Gravelly SAND, some silt (TILL)		1.22	3	DO	>100				
2		Hard, brown to grey-brown, Silty SAND with GRAVEL, trace to some clay, cobbles/boulders present (TILL)		2.13	4	DO	>100			MH	
3					5	WS					
4					6	DO	>100				
		Grey-brown, SAND, trace to some gravel		4.57	7	WS					
5					8	WS					
		Very dense to dense, grey-brown, Gravelly SAND, some silt to SAND, some gravel, some silt (TILL)		5.33	9	DO	52				
6					10	WS					
7					11	DO	31				
8		Very stiff to hard, greenish brown, SILTY CLAY with SAND, some gravel, cobbles/boulders present (TILL)		8.38	12	DO	25			MH	
9											
10					13	DO	51				
		END OF BOREHOLE		10.52							
11											

DEPTH SCALE

1 : 55

Golder Associates

LOGGED: JR

CHECKED: IM

GTA-BHS 001 1090020032.GPJ GAL-MIS.GDT 9/29/11

PROJECT: AJAX Mine

RECORD OF BOREHOLE: BH 10-2

SHEET 1 OF 1

LOCATION: N 5611174.00 ;E 678907.00

BORING DATE: 2/5/2011

DATUM: NAD 83

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. +, rem V. ⊕, Q - ●, U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp, W, Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE									
0	Geotech Drilling Ltd: B-54 Odex Downhole Hammer	Loose, brown, SILT, trace sand, containing organics and roots		0.00							
		Compact, grey-brown, SILT and SAND, some gravel		0.18	1	DO	11				
1		Compact, grey-brown, Gravelly SAND, trace silt		0.76	2	DO	19				
		Very dense, grey-brown, Sandy GRAVEL, trace silt, cobbles present (TILL)		1.28	3	DO	79				
2		Hard, brown to greenish brown, Gravelly CLAYEY SAND, trace to some silt (TILL)		2.29	4	DO	52			MH	
3					5	DO	60				
4		Dense, grey and brown, Silty SAND, trace to some gravel, trace clay (TILL)		3.96	6	WS					
5					7	DO	46				
6					8	DO	47				
7		Hard, grey, CLAYEY SILT with SAND, trace gravel (TILL)		7.23	9	DO	>100			MH	
8		Very dense, grey and brown, Silty SAND, trace gravel to SAND, some silt, trace gravel (TILL)		8.23	10	WS					
9											
10					11	DO	>100				
		END OF BOREHOLE		10.21							
11											

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DEPTH SCALE

1 : 55

Golder Associates

LOGGED: RNS

CHECKED: IM

PROJECT: AJAX Mine

RECORD OF BOREHOLE: BH 10-3

SHEET 1 OF 1

LOCATION: N 5610209.00 ;E 678991.00

BORING DATE: 2/5/2011

DATUM: NAD 83

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. +, rem V. ⊕, Q - ●, U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp, W, Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE									Stick-up: 0.17 m (to be raised)
0	Geotech Drilling Ltd: B-54 Odex Downhole Hammer	Loose, brown, Sandy SILT, containing organics and roots		0.00							
		Loose to compact, grey, SILT, trace to some sand		0.18	1	DO	10				
1					2	DO	5				
		Loose, grey, Silty SAND to Sandy SILT, containing layers of SILT and SAND		1.52	3	DO	9				Bentonite
2		Compact, brown, SAND and GRAVEL, trace to some fines		2.29	4	DO	17			M	
3					6	WS					
					5	DO	28				
		Compact, grey-brown, Silty SAND to SILT and SAND, some gravel, containing layers of grey Sandy SILT, trace to some gravel, trace clay		3.66	7	WS					06/02/2011 50mm PVC Pipe
4											
					8	DO	25				1.52m 50mm Slotted PVC Pipe
5											
		Very dense, grey-brown, GRAVEL, some silt, some sand to GRAVEL and SAND, trace to some silt (TILL)		5.79							
6					9	DO	69				
		Very dense, grey, Silty SAND, some gravel (TILL)		6.40							
7					10	WS					
					11	DO	>100				
8											
					12	WS					
9		Very dense, grey, SILT, some gravel, some sand, trace clay (TILL)		9.14							
					13	DO	78				
10		END OF BOREHOLE		10.36							
11											

DEPTH SCALE

1 : 55

LOGGED: RNS

CHECKED: IM

GTA-BHS 001 1090020032.GPJ GAL-MIS.GDT 9/29/11

PROJECT: AJAX Mine

RECORD OF BOREHOLE: BH 10-4

SHEET 1 OF 1

LOCATION: N 5609246.00 ;E 679364.00

BORING DATE: 2/8/2011

DATUM: NAD 83

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. +, rem V. ⊕, Q - ●, U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp, W, Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE									
0	Geotech Drilling Ltd: B-54 Odex Downhole Hammer	Brown, SILT, some gravel, trace to some sand, containing organics (frozen)		0.00	1	DO	20				
1		Very stiff to hard, grey to brown, SILTY CLAY with SAND, some gravel (TILL)		0.91	2	DO	>100				
2					3	DO	49				
					4	DO	45			MH	
3					5	DO	32				
4											
5					6	DO	22				
6											
					7	DO	26				
7											
					8	DO	24			MH	
8											
9					9	DO	>100				
					10	WS					
10		Very dense, grey-brown, Sandy SILT and GRAVEL (TILL)			11	DO	>100				
		END OF BOREHOLE		10.26							
11											

DEPTH SCALE

1 : 55

Golder Associates

LOGGED: JR

CHECKED: IM

GTA-BHS 001 1090020032.GPJ GAL-MIS.GDT 9/29/11

PROJECT: AJAX Mine

RECORD OF BOREHOLE: BH 10-5

SHEET 1 OF 1

LOCATION: N 5609202.00 ;E 679938.00

BORING DATE: 2/6/2011

DATUM: NAD 83

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●, rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp W Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE									
0	Geotech Drilling Ltd: B-54 Odex Downhole Hammer	Brown, Silty SAND, containing organics and roots (frozen)		0.00							
		Compact, grey, SAND, some silt, trace gravel		0.12	1	DO	15				
1		Very dense, grey, Sandy SILT, trace to some gravel (TILL)		0.76	2	DO	>100				
2					3	DO	61				
		Very stiff, grey to grey-brown, SILTY CLAY with SAND with GRAVEL (TILL)		2.29	4	DO	29			MH	
3		Dense, grey, Sandy SILT, trace to some gravel, trace clay (TILL)		2.90	5 6	DO WS	40				
4											
5					7	DO	49				
6		Hard, grey, CLAYEY SILT with SAND, trace gravel (TILL)		5.79	8	DO	39				
7											
8					9	DO	32			MH	
		Dense, grey, SILT, some sand, trace gravel, trace clay (TILL)		8.23	10	WS					
9											
10		Compact, grey-brown, interlayered to laminated SILT to CLAYEY SILT, trace to some sand (TILL)		9.88	11	DO	18				
		END OF BOREHOLE		10.36							
11											

GTA-BHS 001 1090020032.GPJ GAL-MIS.GDT 9/29/11

DEPTH SCALE

1 : 55

Golder Associates

LOGGED: RNS

CHECKED: IM

PROJECT: AJAX Mine

RECORD OF BOREHOLE: BH 10-6

SHEET 1 OF 1

LOCATION: N 5610213.00 ;E 680286.00

BORING DATE: 2/8/2011

DATUM: NAD 83

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. +, rem V. ⊕, Q - ●, U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp, W, Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE									
0	Geotech Drilling Ltd: B-54 Odex Downhole Hammer	Loose, grey, SILT, some sand, trace to some gravel, containing organics and roots		0.00	1	DO	9				
1		Compact, grey-brown, SILT, some gravel, some sand, containing thin layers of SILT, trace to some clay, trace sand, trace gravel		0.61	2	DO	25				
2		Dense, grey, SILT, trace sand, trace gravel (TILL)		1.52	3	DO	43				
3		Hard, grey-brown, SILT with SAND, trace to some clay, some gravel (TILL)		2.29	4	DO	>100			MH	
4					5	DO	47				
5		Very dense, grey-brown, SILT, some sand, trace gravel, trace clay (TILL)		4.27	6	DO	56				
6		Dense, grey-brown, interlayered to laminated SILT to CLAYEY SILT, trace sand (TILL)		6.40	7	DO	39				
7		Hard, grey-brown, CLAYEY SILT with SAND, trace gravel (TILL)		7.32	8	DO	64			MH	
8											
9		Dense, grey, SILT, trace sand, trace clay to SILT, some sand, trace clay, containing occasional layers of SILT, some clay (TILL)		8.84	9	DO	39				
10		Very dense, grey-brown, SILT, trace sand (TILL)		9.75	10	DO	67				
11		END OF BOREHOLE		10.67							

DEPTH SCALE

1 : 55

LOGGED: JR

CHECKED: IM

Golder Associates

GTA-BHS 001 1090020032.GPJ GAL-MIS.GDT 9/29/11

PROJECT: AJAX Mine

RECORD OF BOREHOLE: BH 10-7

SHEET 1 OF 1

LOCATION: N 5611189.00 ;E 680426.00

BORING DATE: 2/9/2011

DATUM: NAD 83

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. +, rem V. ⊕, Q - ●, U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp, W, Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE									
0	Geotech Drilling Ltd: B-54 Odex Downhole Hammer	Grey-brown, SILT, some sand, trace gravel to Sandy SILT, trace gravel, containing roots (frozen)		0.00	1	DO	12				
1		Compact, grey-brown, SILT, trace to some sand, trace gravel, trace clay		0.61	2	DO	17				
					3	DO	19				
2		Hard, grey-brown, CLAYEY SILT with SAND, some gravel, cobble/boulders present (TILL)		2.13	4	DO	33			MH	
3					5	DO	31				
4					6	WS					
		Dense, grey-brown, GRAVEL and SILT, trace to some clay, cobbles/boulders present (TILL)		4.11							
5					7	DO	31				
					8	WS					
		Dense, grey, SILT, trace sand, trace gravel to SILT, trace to some clay (TILL)		5.49							
6					9	DO	33				
7		Very stiff to hard, grey, SILT with CLAY, trace to some sand, trace gravel (TILL)		7.32							
8					10	DO	22				
9					11	DO	35			MH	
10		Compact, grey, SILT, trace gravel, trace clay, trace sand (TILL)		9.75							
					12	DO	29				
		END OF BOREHOLE		10.67							
11											

GTA-BHS 001 1090020032.GPJ GAL-MIS.GDT 9/29/11

DEPTH SCALE

1 : 55

Golder Associates

LOGGED: JR

CHECKED: IM

PROJECT: AJAX Mine

RECORD OF BOREHOLE: BH 10-8

SHEET 1 OF 1

LOCATION: N 5611806.00 ;E 680307.00

BORING DATE: 2/15/2011

DATUM: NAD 83

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ● / rem V. ⊕ U - ○)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp W Wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE									
0	Geotech Drilling Ltd: B-80 Odex Downhole Hammer	TOPSOIL		0.00							
		Loose, brown, SILT, trace sand, containing roots		0.10	1	DO	7				
1		Dense, grey-brown, SILT, some gravel, trace to some sand (TILL)		0.76	2	DO	40.				
		Hard, grey-brown, SILTY CLAY with SAND with GRAVEL (TILL)		1.52	3	DO	82			MH	
2		Very dense, grey-brown, GRAVEL and SAND, trace to some silt (TILL)		2.29	4	DO	>100				
3											
		Very dense, grey-brown, Gravelly SILT, some sand, trace clay (TILL)		3.66	5	DO	>100				
4											
5											
					6	DO	57				
6											
		Very dense, grey-brown, GRAVEL and SILT, trace to some sand, trace to some clay, cobbles/boulders present (TILL)		6.71	7	DO	82				
7											
					8	WS					
8		Hard, grey-brown, Gravelly SILTY CLAY with SAND (TILL)		8.23							
					9	DO	56			MH	
9											
		Dense, grey-brown, Gravelly Sandy SILT, trace clay to SILT, some gravel, trace to some sand, trace to some clay, containing layers of SILT, some clay, trace sand (TILL)		9.45							
10					10	DO	33				
		END OF BOREHOLE		10.67							
11											

GTA-BHS 001 1090020032.GPJ GAL-MIS.GDT 9/29/11

DEPTH SCALE

1 : 55

Golder Associates

LOGGED: JR

CHECKED: IM

PROJECT: AJAX Mine

RECORD OF BOREHOLE: BH 10-9

SHEET 1 OF 2

LOCATION: N 5610556.00 ;E 680382.00

BORING DATE: 2/15/20111 to 2/16/2011

DATUM: NAD 83

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ● / rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp W Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE									Stick up: 1.15m
0	Geotech Drilling Ltd: B-80 Odex Downhole Hammer	Very dense, greenish grey, cobbles (FILL)		0.00	1	DO	55				
		Very dense, grey, SILT and SAND, some gravel, containing roots (TILL)		0.30							Cuttings around Steel Protector
1		Very dense, grey-brown, Gravelly SILT, trace to some sand (TILL)		0.61	2	DO	59				50mm Diameter PVC Pipe
		Very dense, grey-brown, Sandy GRAVEL, trace silt (TILL)		1.22	3	DO	>100				
2		Very dense, grey-brown, GRAVEL and SAND, some silt, trace to some clay (TILL)		1.68	4	DO	>100			MH	
					5	DO	>100				Bentonite
3											
		Hard, grey-brown, CLAYEY SILT with SAND, some gravel (TILL)		3.66							Sand pack interval k= 2E-07 cm/s
4					6	DO	77			MH	
5											
6					7	DO	68				
7		Hard, grey-brown, CLAYEY SAND, some silt, some gravel (TILL)		7.01	8	DO	>100			MH	SAND
8		Very dense, grey-brown, GRAVEL and SAND, trace silt (TILL)		8.23	9	DO	>100				
9					10	WS					
		Very dense, grey-brown, Sandy GRAVEL, trace to some silt (TILL)		9.45	11	WS					
10					12	DO	>100				
		Grey, highly weathered BEDROCK - KAMLOOPS GROUP LIKE		10.21	13	WS					
11		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 55

Golder Associates

LOGGED: JR

CHECKED: IM

GTA-BHS 001 1090020032.GPJ GAL-MIS.GDT 9/29/11

PROJECT: AJAX Mine

RECORD OF BOREHOLE: BH 10-9

SHEET 2 OF 2

LOCATION: N 5610556.00 ;E 680382.00

BORING DATE: 2/15/20111 to 2/16/2011

DATUM: NAD 83

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ● / rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp W Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
11		*--- CONTINUED FROM PREVIOUS PAGE ---*									
11	Geotech Drilling Ltd: B-80 NQ Coring	Grey, highly weathered BEDROCK - KAMLOOPS GROUP LIKE									
12					R1	CORE					SAND
		Run 1 and Run 2: Broken core									
13					R2	CORE					Bentonite
14		RQD for 3rd Run = 11.5%			R3	CORE					SAND
		Run 4: Broken core									
15					R4	CORE					1.52m - 50mm Diam. Slotted PVC Pipe
		Grey, moderately weathered BEDROCK - KAMLOOPS GROUP LIKE		15.55							
16		RQD for 5th Run = 23.6%			R5	CORE					Slough
		Becoming highly weathered		16.15							
				16.46							Dry 4/29/2011
17											
18											
19											
20											
21											
22											

DEPTH SCALE

1 : 55

LOGGED: JR

CHECKED: IM

GTA-BHS 001 1090020032.GPJ GAL-MIS.GDT 9/29/11

PROJECT: AJAX Mine

RECORD OF BOREHOLE: BH 10-10

SHEET 1 OF 2

LOCATION: N 5610334.00 ;E 680972.00

BORING DATE: 2/21/2011 to 2/22/2011

DATUM: NAD 83

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. +, rem V. ⊕, Q - ●, U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp, W, Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE									Stick-up: 1 m
0	Geotech Drilling Ltd: B-80 Odex Downhole Hammer	Very dense, grey-brown to greenish grey, SILT, some sand, some gravel to Silty GRAVEL, some sand, trace clay (FILL)		0.00	1	DO	>100				Bentonite 50mm Diameter PVC Pipe
1					2	DO	90				
2		Loose, brown, SILT, trace to some sand, trace gravel, containing organics (TOPSOIL)		1.98	3	DO	9				
		Very stiff, brown, CLAYEY SILT with SAND, some gravel (TILL)		2.29							
3					4	DO	16			MH	
4		Compact to dense, brown, SAND, some gravel, some silt, trace to some clay (TILL)		3.96	5	DO	15				
					6	DO	48			MH	
5											
6					7	DO	91				SAND Sand pack interval k1= 2E-06 cm/s k2= 1E-05 cm/s k3= 3E-06 cm/s
		Grey and black, highly weathered BEDROCK KAMLOOPS GROUP LIKE		6.25	8	WS					
7					9	WS					
											4/29/2011
8											3/8/2011
9	Geotech Drilling Ltd: B-80 NQ Coring	Run 1 and 2: Broken core			R 1	CORE					
10					R 2	CORE					
		Quartz intrusions		10.52	R 3	CORE					Bentonite
11		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 55

Golder Associates

LOGGED: JR

CHECKED: IM

GTA-BHS 001 1090020032.GPJ GAL-MIS.GDT 9/29/11

PROJECT: AJAX Mine

RECORD OF BOREHOLE: BH 10-10

SHEET 2 OF 2

LOCATION: N 5610334.00 ;E 680972.00

BORING DATE: 2/21/2011 to 2/22/2011

DATUM: NAD 83

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3})	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		--- CONTINUED FROM PREVIOUS PAGE ---						SHEAR STRENGTH Cu, kPa: nat V. + Q - ●; rem V. ⊕ U - ○ (20 40 60 80)	WATER CONTENT PERCENT: Wp — W — Wl (10 20 30 40)		
11	Geotech Drilling Ltd: B-80 NQ Coring	RQD for Run 3 = 43.3% Quartz intrusions			R 3	CORE					Bentonite
		Grey and black (to grey with black banding)		11.28							SAND
12					R 4	CORE					
13					R 5	CORE					3.05m - 50mm Diam. Slotted PVC Pipe
14	Geotech Drilling Ltd: B-80 Opex Downhole Hammer	Runs 4, 5, and 6: Broken core			R 6	CORE					
15					10	WS					SAND
		END OF BOREHOLE		15.24							
16											
17											
18											
19											
20											
21											
22											

GTA-BHS 001 1090020032.GPJ GAL-MIS.GDT 9/29/11

DEPTH SCALE

1 : 55

Golder Associates

LOGGED: JR

CHECKED: IM

PROJECT: AJAX Mine

RECORD OF BOREHOLE: BH 10-11

SHEET 1 OF 2

LOCATION: N 5610537.00 ;E 680877.00

BORING DATE: 3/7/2011

DATUM: NAD 83

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. +, rem V. ⊕, Q - ●, U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp, W, Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE									Stick-up: 0.95 m
0	Geotech Drilling Ltd: B-80 Odex Downhole Hammer	Brown, SILT, some sand, containing roots (TOPSOIL - frozen)		0.00							
		Dense, brown, SILT, some sand, some gravel		0.15	1	DO	38				50mm Diam. PVC Pipe
1		Hard, brown, CLAY with GRAVEL, some sand, some silt, cobbles/boulders present (TILL)		0.91	2	DO	54				
2					3	DO	64			MH	
					4	DO	35				
3					5	DO	64				
4											
					6	DO	47				
5											Bentonite Dry : 3/8/2011
6		Hard, brown, SILTY CLAY with SAND, trace to some gravel, cobbles/boulders present (TILL)		6.10							4/29/2011
					7	DO	31			MH	
7											
					8	DO	34				
8											
9					9	DO	29			MH	
10											
					10	DO	34				
11		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 55

LOGGED: JR

CHECKED: IM

Golder Associates

GTA-BHS 001 1090020032.GPJ GAL-MIS.GDT 9/29/11

PROJECT: AJAX Mine

RECORD OF BOREHOLE: BH 10-11

SHEET 2 OF 2

LOCATION: N 5610537.00 ;E 680877.00

BORING DATE: 3/7/2011

DATUM: NAD 83

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ● / rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp W Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
11		*--- CONTINUED FROM PREVIOUS PAGE ---*									
11	Geotech Drilling Ltd: B-80 Odex Downhole Hammer	Hard, brown, SILTY CLAY with SAND, trace to some gravel, cobbles/boulders present (TILL)			10	DO	34				
12					11	DO	43				
13		Hard, grey-brown, CLAYEY SAND with GRAVEL, some silt		13.11							
14					12	DO	70			MH	Bentonite
15					13	WS					
16					14	DO	>100				
17					15	DO	50				SAND Pack
18					16	WS					Sand pack interval k1= 2E-07 cm/s k2= 4E-08 cm/s
19											3.05m Slotted 50mm Diam. PVC Pipe
20					17	DO	78				
21					18	WS					Slough
		END OF BOREHOLE		21.34							
22											

GTA-BHS 001 1090020032.GPJ GAL-MIS.GDT 9/29/11

DEPTH SCALE

1 : 55

Golder Associates

LOGGED: JR

CHECKED: IM

PROJECT: AJAX Mine

RECORD OF BOREHOLE: BH 10-12

SHEET 1 OF 3

LOCATION: N 5610893.00 ;E 680849.00

BORING DATE: 2/20/2011

DATUM: NAD 83

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. +, rem V. ⊕, Q - ●, U - ○)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp, W, Wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE									Stick-up: 0.87 m
0	Geotech Drilling Ltd: B-80 Odex Downhole Hammer	Compact, brown, SILT, some sand, containing roots (TOPSOIL)		0.00							
		Hard, grey-brown, SILTY CLAY with SAND, some gravel, cobbles/boulders present (TILL)		0.30	1	DO	26				Bentonite around Steel Protector 50mm Diameter PVC Pipe
1					2	DO	55			MH	
					3	DO	100				
2					4	WS					
		Hard, grey-brown, CLAYEY SAND, some gravel, trace silt (TILL)		2.44	5	DO	>100				
3											
											4/29/2011
4					6	DO	84			MH	
											BH Cuttings
5											
		Very dense, grey-brown, SILT, trace to some gravel, trace to some sand, trace clay, containing layers of CLAYEY SILT (TILL)		5.18							
6					7	DO	78				
											3/8/2011
		Hard, grey-brown, Gravelly SILTY CLAY with SAND (TILL)		6.71							
7					8	DO	76				
8											
					9	DO	52			MH	Bentonite
9											
											SAND
10		Very dense, grey, grey to greenish grey, Gravelly SILT, trace to some sand, trace clay, cobbles/boulders present (TILL)		9.75							
					10	DO	54				1.52m - 50mm Diam. Slotted PVC Pipe
11		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 55

Golder Associates

LOGGED: JR / RNS

CHECKED: IM

GTA-BHS 001 1090020032.GPJ GAL-MIS.GDT 9/29/11

PROJECT: AJAX Mine

RECORD OF BOREHOLE: BH 10-12

SHEET 2 OF 3

LOCATION: N 5610893.00 ;E 680849.00

BORING DATE: 2/20/2011

DATUM: NAD 83

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. +, rem V. ⊕, Q - ●, U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp, W, Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		--- CONTINUED FROM PREVIOUS PAGE ---									
11	Geotech Drilling Ltd: B-80 Odex Downhole Hammer	Very dense, grey, grey to greenish grey, Gravelly SILT, trace to some sand, trace clay, cobbles/boulders present (TILL)			11	WS					Sand pack interval k= 5E-08 cm/s
12					12	DO	52				1.52m - 50mm Diam. Slotted PVC Pipe
13					13	DO	>100				SAND
14	Geotech Drilling Ltd: B-80 NQ Coring				R 1	CORE					
15					R 2	CORE					
16					14	WS					
17					15	DO	78				
18	Geotech Drilling Ltd: B-80 Odex Downhole Hammer				16	DO	59				Bentonite
19											
20					17	DO	64				
21					18	DO	80				
22		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 55

Golder Associates

LOGGED: JR / RNS

CHECKED: IM

GTA-BHS 001 1090020032.GPJ GAL-MIS.GDT 9/29/11

PROJECT: AJAX Mine

RECORD OF BOREHOLE: BH 10-12

SHEET 3 OF 3

LOCATION: N 5610893.00 ;E 680849.00

BORING DATE: 2/20/2011

DATUM: NAD 83

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ● / rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp W Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
22		*--- CONTINUED FROM PREVIOUS PAGE ---*									
22	Geotech Drilling Ltd: B-80 Odex Downhole Hammer	Very dense, grey, grey to greenish grey, Gravelly SILT, trace to some sand, trace clay, cobbles/boulders present (TILL)			19	WS					
23											
24					20	DO	78				
25											
26					21	WS					Bentonite
					22	WS					
27											
28											
					23	DO	8				
29											
					24	WS					
30		END OF BOREHOLE		29.87							
31											
32											
33											

DEPTH SCALE

1 : 55

LOGGED: JR / RNS

CHECKED: IM

GTA-BHS 001 1090020032.GPJ GAL-MIS.GDT 9/29/11

PROJECT: AJAX Mine

RECORD OF BOREHOLE: BH 10-14

SHEET 1 OF 2

LOCATION: N 5612331.00 ;E 680252.00

BORING DATE: 4/26/2011 to 4/27/2011

DATUM: NAD 83

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. +, rem V. ⊕, Q - ●, U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp, W, Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE									
0	Geotech Drilling Ltd: Geoprobe 7822DT Odex Downhole Hammer	Loose, brown, SILT, containing organics		0.00	1	DO	4				
1		Compact, brown, SILT, some sand, some gravel		0.46	2	DO	15				
2		Hard, brown, SILTY CLAY with SAND, some gravel, cobbles/boulders present (TILL)		1.52	3	DO	36				Bentonite 50mm Diameter PVC Pipe
					4	DO	29				
3					5	DO	37				
4											
5					6	DO	42			MH	
6											
					7	DO	60				
7					8	WS	-				Borehole Cuttings Dry
8		Hard, brown, SILTY CLAY with SAND with GRAVEL (TILL)		7.92							
					9	DO	32				
9											
					10	DO	34				
10											
					11	DO	>100				
11		*CONTINUED NEXT PAGE*									

DEPTH SCALE
1 : 55

Golder Associates

LOGGED: JR
CHECKED: IM

GTA-BHS 001 1090020032.GPJ GAL-MIS.GDT 9/29/11

PROJECT: AJAX Mine

RECORD OF BOREHOLE: BH 10-14

SHEET 2 OF 2

LOCATION: N 5612331.00 ;E 680252.00

BORING DATE: 4/26/2011 to 4/27/2011

DATUM: NAD 83

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. +, rem V. ⊕, Q - ●, U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp, W, Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		--- CONTINUED FROM PREVIOUS PAGE ---									
11	Geotech Drilling Ltd: Geoprobe 7822DT; Odex Downhole Hammer	Hard, brown, SILTY CLAY with SAND with GRAVEL (TILL)									Borehole Cuttings
12					12	DO	40				
13											
14					13	DO	51			MH	Bentonite
15											
16					14	DO	47				SAND Pack
17					15	DO	43				1.52m - 50mm Diam. Slotted PVC Pipe
18					16	WS					
				18.29							4/26/2011
19											
20											
21											
22											

DEPTH SCALE

1 : 55

Golder Associates

LOGGED: JR

CHECKED: IM

GTA-BHS 001 1090020032.GPJ GAL-MIS.GDT 9/29/11

LORAX ENVIRONMENTAL

Borehole Log of LE12-01

(Sheet 1 of 1)

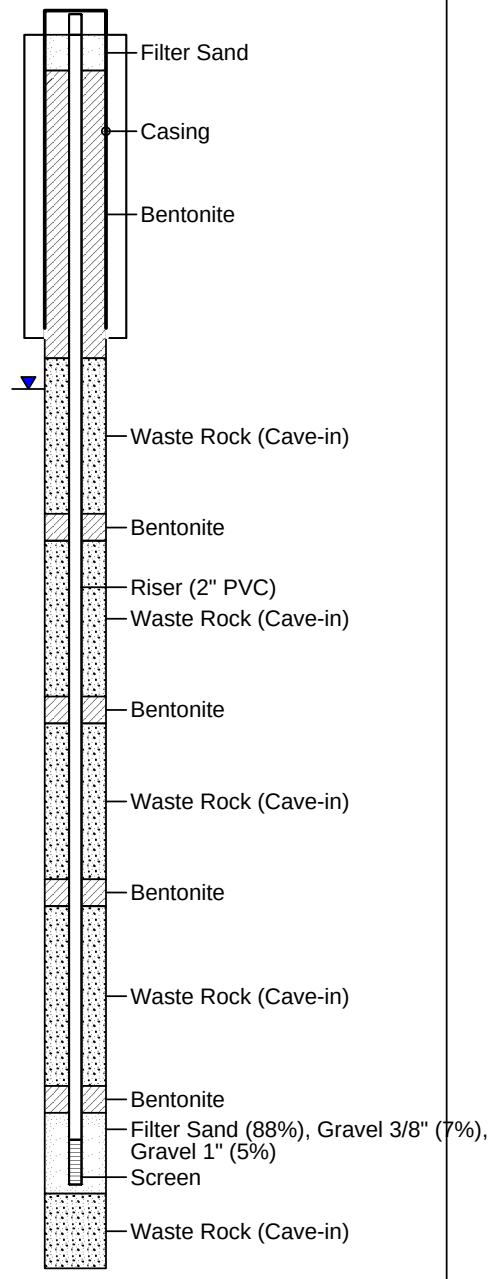
KGHM Ajax Mining Inc.

Ajax

Project #: J933-2

Date Started	: Nov.27, 2012	Northing Coord.	: 5609892
Date Completed	: Nov.29, 2012	Easting Coord.	: 0684638
Hole Diameter	: 187 mm	Logged By	: JH
Drilling Method	: Dual Rotary		
Drilling Company	: J.R. Drilling Central		

Depth (m)	GRAPHIC	DESCRIPTION	Sample	Sample Type	% Recovery
0		SAND, SILT and CLAY, some gravel, grasses on surface, moist			
		WASTE ROCK, silt-gravel size drill cuttings, grey-blue, dry		DC	
5				DC	
10				DC	
				DC	
15				DC	
				DC	
20				DC	
				DC	
25				DC	
				DC	
30				DC	
		Boulder at approx. 31.9 m			
				DC	
35		Drill hole produced approx. 225 L of groundwater per minute			
40		BEDROCK, drilling advancement slowed		DC	
45		EOH @ 41.2 m			



01-11-2013 P:\J933 Ajax\MW installation program\Data\BH Logs\LE12-01.bor

LORAX ENVIRONMENTAL

Borehole Log of LE12-02

(Sheet 1 of 1)

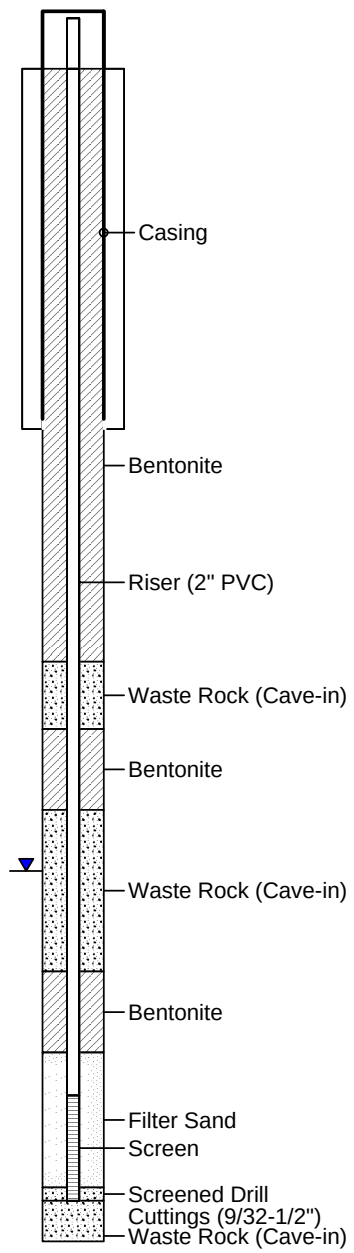
KGHM Ajax Mining Inc.

Ajax

Project #: J933-2

Date Started	: Nov.28, 2012	Northing Coord.	: 5609894
Date Completed	: Nov.29, 2012	Easting Coord.	: 0684637
Hole Diameter	: 187 mm	Logged By	: JH
Drilling Method	: Dual Rotary		
Drilling Company	: J.R. Drilling Central		

Depth (m)	GRAPHIC	DESCRIPTION	Sample	Sample Type	% Recovery
0		SAND, SILT, and CLAY, some gravel, grasses on surface, moist			
		WASTE ROCK, silt to gravel size drill cuttings, grey/blue, dry			
				DC	
5				DC	
				DC	
10				DC	
		Moist drill cuttings at 12.2 m			
		Boulder at 12.5 m		DC	
15					
		EOH @ 17.4 m			
20					



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Borehole Log of LE12-03

(Sheet 1 of 1)

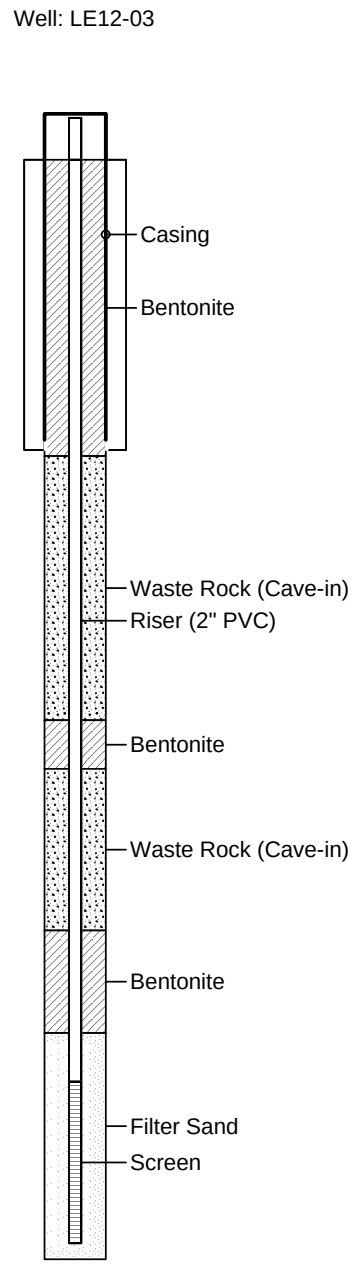
KGHM Ajax Mining Inc.

Ajax

Project #: J933-2

Date Started	: Nov.29, 2012	Northing Coord.	: 5608830
Date Completed	: Nov.30, 2012	Easting Coord.	: 0684387
Hole Diameter	: 187 mm	Logged By	: JH
Drilling Method	: Dual Rotary		
Drilling Company	: J.R. Drilling Central		

Depth (m)	GRAPHIC	DESCRIPTION	Sample	Sample Type	% Recovery
0		SAND, SILT and CLAY, some gravel, grasses on surface, moist to wet			
		WASTE ROCK, silt to gravel size drill cuttings, blue/grey, dry			
				DC	
5				DC	
				DC	
10				DC	
				DC	
15				DC	
		CLAY, with some sand, silt, and gravel, rounded gravel at top of layer		DC	
20				DC	
		EOH @20.4 m			
25					



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Borehole Log of LE12-04

(Sheet 1 of 1)

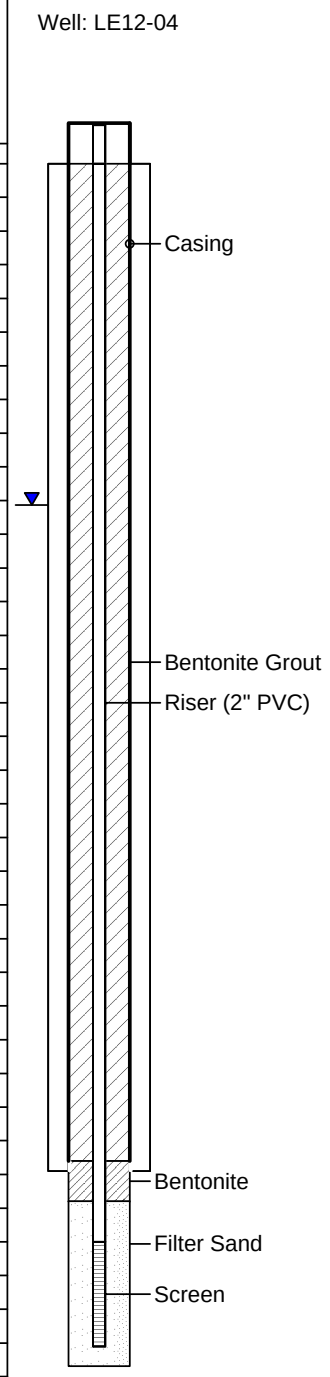
KGHM Ajax Mining Inc.

Ajax

Project #: J933-2

Date Started	: Nov.30, 2012	Northing Coord.	: 5609146
Date Completed	: Nov.30, 2012	Easting Coord.	: 0684327
Hole Diameter	: 187 mm	Logged By	: JH
Drilling Method	: Dual Rotary		
Drilling Company	: J.R. Drilling Central		

Depth (m)	GRAPHIC	DESCRIPTION	Sample	Sample Type	% Recovery
0		SILTY SAND, some gravel, brown, dry			
		Slightly moist, small roots observed at 2.9-3.0 m			
				SS	0
		TILL, sand, silt, and clay, some gravel, grey, very stiff to hard, slightly moist		SS	30
5					
		Wet seam at 7.6 m		SS	0
		Gravel content increasing with depth		SS	20
10					
				SS	80
15					
20					
25		SILTY SAND, fine grained, grey, wet			
				SS	50
30					
		GRAVEL, wet			
35		SILTY SAND, fine grained, grey, wet			
		EOH 35.7 m			
40					



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TEST HOLE LOG

VERTICAL SCALE

SAMPLE DATA

HAMMER MASS kg

DROP HEIGHT m

DEPTH / ELEV	O.D. / I.D.	BLOWS / 0.3m	NO.	SYMBOL

DATE DRILLED 2/16/88 - 2/18/88

DRILL TYPE Reverse Circulation

ELEVATION GROUND 892

CO-ORD LOCATION N4630; E4401

PIEZOMETER DETAILS

COHESION kPa

10 30 50 70 90

● FIELD VANE △ LAB VANE ■ UNCONF

PLASTIC LIMIT X ———— WATER CONTENT O ———— LIQUID LIMIT X

10 30 50 70 90%

DESCRIPTION OF MATERIAL

(m)

5

SILT-SAND-GRAVEL
trace clay, dry (reworked TILL)

10

Light brown SILT with occasional fine gravel, very dry

Coarser gravels

15

Blue-grey fine sandy SILT, trace clay

Angular gravels, blue grey SILT matrix (TILL)

20

Blue-grey, SILT-SAND GRAVEL, (TILL)
small gravelly zones

25

Bedrock
Dark green-gray fine grained volcanic.
Chloritized
Plagioclase. Mostly fractured with or without chlorite/epidote fracture linings.
No significant water inflows.
No changes in basic rock type to bottom of hole.

30

35

40

45

50

KLOHN LEONOFF
CONSULTING ENGINEERS

JOB No.	PB 1836 0302
PROJECT	Afton Ajax Expansion
LOCATION	Kamloops, Jacko Lake
HOLE No.	R 88-1
DATE	PLATE

TEST HOLE LOG

VERTICAL SCALE

SAMPLE DATA

HAMMER MASS kg

DROP HEIGHT m

DEPTH ELEV	O.D. I.D.	BLOWS 0.3m	NO.

SYMBOL

DATE DRILLED 2/16/88 - 2/18/88

DRILL TYPE Reverse Circulation

ELEVATION GROUND 892

CO-ORD. LOCATION N4630; E4401

DESCRIPTION OF MATERIAL

PIEZOMETER DETAILS

COHESION kPa

10 30 50 70 90

● FIELD VANE △ LAB VANE ■ UNCONF

PLASTIC LIMIT | WATER CONTENT | LIQUID LIMIT

X ---- O ---- X

10 30 50 70 90%

(m)

55

60

65

70

75

80

Clay filled fracture zone. Large planar chunks of fat clay with fragments of dioritic rock in it. Some hematite and sulfide mineralization.

Total Depth 80 m

KLOHN LEONOFF

CONSULTING ENGINEERS

JOB No. PB 1836 0302

PROJECT Afton Ajax Expansion

LOCATION Kamloops, Jacko Lake

HOLE No. R 88-1

DATE PLATE

TEST HOLE LOG

VERTICAL SCALE

SAMPLE DATA

HAMMER MASS kg

DROP HEIGHT m

DEPTH ELEV	O.D. I.D	BLOWS 0.3m	NO

SYMBOL

DATE DRILLED 2/20/88 - 2/21/88

DRILL TYPE Reverse Circulation

ELEVATION GROUND 892

CO-ORD LOCATION N4008; E4616

PIEZOMETER DETAILS

COHESION kPa

10 30 50 70 90

● FIELD VANE △ LAB VANE ■ UNCONF

PLASTIC LIMIT | WATER CONTENT | LIQUID LIMIT

X ---- O ---- X

10 30 50 70 90%

DESCRIPTION OF MATERIAL

(m)

5

10

15

20

25

30

35

40

45

50

SILT-SAND-CLAY with some gravel (Glacial TILL)

Grades from brown at the surface to gray at the bottom.
Moist
Minor seepage into hole.

Dark blue fine grained volcanic.
Quartz lined fractures.

Seprentinized shear fracture.
Moderately fractured.

Pyrite mineralization, some amphiboles.

Serpentine or asbestos seam gradational or uneven contact with ultramafic unit. Dark grey to black with amphibole phenocrysts and disseminated pyrite. Mostly fractured.

KLOHN LEONOFF
CONSULTING ENGINEERS

JOB No.	PB 1836 0302
PROJECT	Afton Ajax Expansion
LOCATION	Kamloops, Jacko Lake
HOLE No.	R 88-2
DATE	PLATE

TEST HOLE LOG

VERTICAL SCALE

SAMPLE DATA

HAMMER MASS kg

DROP HEIGHT m

DEPTH ELEV	O.D. I.D.	BLOWS 0.3m	NO	SYMBOL

DATE DRILLED 2/20/88 - 2/21/88

DRILL TYPE Reverse Circulation

ELEVATION GROUND 892

CO-ORD. LOCATION N4008; E4616

PIEZOMETER DETAILS

COHESION kPa

10 30 50 70 90

● FIELD VANE △ LAB VANE ■ UNCONF

PLASTIC LIMIT X — WATER CONTENT O — LIQUID LIMIT X

10 30 50 70 90%

DESCRIPTION OF MATERIAL

(m)	
55	Picritic basalt. Some olivine.
60	Dark grey rock with plagioclase and amphibole or pyroxene phenocrysts. Andesite
65	Gypsum or anhydrite fracture fillings. Zeolite
70	Dark grey with rounded black blobs.
75	
80	
85	
90	Abundant serpentine and pyrite
95	
100	Total depth 100 m

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JOB No.	PB 1836 0302
PROJECT	Afton Ajax Expansion
LOCATION	Kamloops, Jacko Lake
HOLE No.	R 88-2
DATE	PLATE

TEST HOLE LOG

VERTICAL SCALE

SAMPLE DATA

HAMMER MASS kg

DROP HEIGHT m

DEPTH ELEV	O.D. I.D.	BLOWS 0.3m	NO.	SYMBOL

DATE DRILLED 2/22/88

DRILL TYPE Reverse Circulation

ELEVATION GROUND 891

CO-ORD. LOCATION N4135; E4660

PIEZOMETER DETAILS

COHESION kPa

10 30 50 70 90

● FIELD VANE △ LAB VANE ■ UNCONF

PLASTIC LIMIT | WATER CONTENT | LIQUID LIMIT

X ———— O ———— X

10 30 50 70 90%

DESCRIPTION OF MATERIAL

(m)

5

10

Rounded gravels and cobbles in a sandy matrix

Minor water at 7.3 m

Total depth = 7.6 m

Boulder or bedrock

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CONSULTING ENGINEERS

JOB No.	PB 1836 0302
PROJECT	Afton Ajax Expansion
LOCATION	Kamloops, Jacko Lake
HOLE No.	R 88-3
DATE	PAGE

TEST HOLE LOG

VERTICAL SCALE

SAMPLE DATA

HAMMER MASS kg

DROP HEIGHT m

DEPTH ELEV	O.D. I.D.	BLOWS 0.3m	NO.	SYMBOL

DATE DRILLED 2/22/88 - 2/24/88

DRILL TYPE Reverse Circulation

ELEVATION GROUND 894

CO-ORD. LOCATION N4496; E4612

PIEZOMETER DETAILS

COHESION kPa

10 30 50 70 90

● FIELD VANE △ LAB VANE ■ UNCONF

PLASTIC LIMIT | WATER CONTENT | LIQUID LIMIT

X ———— O ———— X

10 30 50 70 90%

DESCRIPTION OF MATERIAL

(m)

5

Light brown SILT-SAND-GRAVEL, trace clay

10

Grey, SILT-SAND-fine GRAVEL with some clay (Glacial TILL)

15

Grey silty SAND with gravel. Heaving formation, easy drilling.

20

Dense blue-gray SILT-SAND-CLAY (Glacial TILL)

Blue-gray fine grained Volcanic

Total depth 20 m.

25

30

35

40

KLOHN LEONOFF
CONSULTING ENGINEERS

JOB No.	PB 1836 0302
PROJECT	Afton Ajax Expansion
LOCATION	Kamloops, Jacko Lake
HOLE No.	R 88-4
DATE	PLATE

TEST HOLE LOG

VERTICAL SCALE

SAMPLE DATA

HAMMER MASS kg

DROP HEIGHT m

DEPTH ELEV	O.D. I.D.	BLOWS 0.3m	NO

SYMBOL

DATE DRILLED

DRILL TYPE Diamond Core

ELEVATION GROUND 895

CO-ORD. LOCATION N4448; E4729

DESCRIPTION OF MATERIAL

PIEZOMETER DETAILS

COHESION kPa

10 30 50 70 90

● FIELD VANE △ LAB VANE ■ UNCONF

PLASTIC LIMIT | WATER CONTENT | LIQUID LIMIT

X ———— O ———— X

10 30 50 70 90%

(m)

10

20

30

40

50

60

70

80

Glacial TILL

Driller reported soft formation, fast drilling.

Bedrock: fine grained volcanic or shallow intrusive. Generally fractured.
Fractures filled with chlorite and/or calcite.
Fracture zone.

Fracture zone.

Fracture zone.

Fracture zone.

Total Depth 80 m

KLOHN LEONOFF
CONSULTING ENGINEERS

JOB No.	PB 1836 0302
PROJECT	Afton Ajax Expansion
LOCATION	Kamloops, Jacko Lake
HOLE No.	DDH 88-7
DATE	PAGE

TEST HOLE LOG

VERTICAL SCALE

SAMPLE DATA

HAMMER MASS kg

DROP HEIGHT m

DEPTH ELEV	O.D. I.D.	BLOWS 0.3m	NO

SYMBOL

DATE DRILLED 3/2/88

DRILL TYPE Backhoe

ELEVATION GROUND 940

CO-ORD. LOCATION N5000; E4620

PIEZOMETER DETAILS

COHESION kPa

10 30 50 70 90

● FIELD VANE △ LAB VANE ■ UNCONF

PLASTIC LIMIT | WATER CONTENT | LIQUID LIMIT

X ———— O ———— X

10 30 50 70 90%

DESCRIPTION OF MATERIAL

(m)

0.5

1.0

1.5

2.0

2.5

3.0

3.5

4.0

Surface organics.

Light brown SILT, medium dense, with some gravel.
Dry

Bedrock.
Total depth = 1.5 m.

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JOB No.	PB 1836 0302
PROJECT	Afton Ajax Expansion
LOCATION	Kamloops, Jacko Lake
HOLE No.	TP-1A
DATE	PLATE

TEST HOLE LOG

VERTICAL SCALE

DATE DRILLED 3/2/88

DRILL TYPE Backhoe

ELEVATION GROUND 940

CO-ORD. LOCATION N5019; E4652

SAMPLE DATA

HAMMER MASS kg

DROP HEIGHT m

DEPTH ELEV	O.D. I.D.	BLOWS 0.3m	NO.	SYMBOL	DESCRIPTION OF MATERIAL	PIEZOMETER DETAILS
(m)					Surface organics	
0.5					Light brown SILT with small gravel. Medium dense, dry.	
1.0						
1.5					Light brown SILT-SAND with some clay and rounded gravel. Dense, dry (TILL)	
2.0						
2.5						
3.0						
3.5						
4.0					Total depth - 3.6 m	

COHESION kPa

10 30 50 70 90

● FIELD VANE △LAB VANE ■UNCONF

PLASTIC LIMIT | WATER CONTENT | LIQUID LIMIT

X ---- O ---- X

10 30 50 70 90%

KLOHN LEONOFF
CONSULTING ENGINEERS

JOB No.	PB 1836 0302
PROJECT	Afton Ajax Expansion
LOCATION	Kamloops, Jacko Lake
HOLE No.	TP 1B
DATE	PLATE

TEST HOLE LOG

VERTICAL SCALE

SAMPLE DATA

HAMMER MASS kg

DROP HEIGHT m

DEPTH ELEV	O D / I D	BLOWS 0.3m	NO	SYMBOL

DATE DRILLED 2/29/88

DRILL TYPE Backhoe

ELEVATION GROUND 890

CO-ORD LOCATION N4630; E4808

PIEZOMETER DETAILS

COHESION kPa

10 30 50 70 90

● FIELD VANE △ LAB VANE ■ UNCONF

PLASTIC LIMIT | WATER CONTENT | LIQUID LIMIT

X ---- O ---- X

10 30 50 70 90%

DESCRIPTION OF MATERIAL

(m)

0.5

1.0

Surface organics.

1.5

Light tan to white organic SILT with snail shells. Oozing, saturated, faint lineations.

2.0

Light brown organic SILT. Plastic wet. Faint lineations.

2.5

3.0

3.5

Blue grey SILT-CLAY-GRAVEL with boulders (Glacial TILL)

Total depth - 3.2 m

KLOHN LEONOFF
CONSULTING ENGINEERS

JOB No. PB 1836 0302

PROJECT Afton Ajax Expansion

LOCATION Kamloops, Jacko Lake

HOLE No. TP 2

DATE PLATE

TEST HOLE LOG

VERTICAL SCALE

SAMPLE DATA

HAMMER MASS kg

DROP HEIGHT m

DEPTH ELEV	O D / I D	BLOWS 0.3m	NO	SYMBOL

DATE DRILLED 2/29/88

DRILL TYPE Backhoe

ELEVATION GROUND 894

CO-ORD LOCATION N4359; E4628

PIEZOMETER DETAILS

COHESION kPa

10 30 50 70 90

● FIELD VANE △ LAB VANE ■ UNCONF

PLASTIC LIMIT | WATER CONTENT | LIQUID LIMIT

X ———— O ———— X

10 30 50 70 90%

DESCRIPTION OF MATERIAL

(m)

0.5

1.0

1.5

2.0

2.5

3.0

3.5

Organic SILT

Light brown SILT-SAND with some clay. Dry uncompacted. Some boulders weathered to clay. (reworked TILL)

$K=2.2 \times 10^{-3}$ cm/s

Light brown SILT-SAND-GRAVEL with clay. Medium dense, damp.

Static water (est.)

Total depth = 3.04 m

KLOHN LEONOFF
CONSULTING ENGINEERS

JOB No.	PB 1836 0302
PROJECT	Afton Ajax Expansion
LOCATION	Kamloops, Jacko Lake
HOLE No.	TP 3
DATE	PLATE

TEST HOLE LOG

VERTICAL SCALE

SAMPLE DATA

HAMMER MASS kg

DROP HEIGHT m

DEPTH ELEV	O D / I D	BLOWS 0.3m	NO

SYMBOL

DATE DRILLED 2/29/88

DRILL TYPE Backhoe

ELEVATION GROUND 891

CO-ORD. LOCATION N4041; E4857

PIEZOMETER DETAILS

COHESION kPa

10 30 50 70 90

● FIELD VANE △ LAB VANE ■ UNCONF

PLASTIC LIMIT | WATER CONTENT | LIQUID LIMIT

X ———— O ———— X

10 30 50 70 90%

DESCRIPTION OF MATERIAL

(m)

0.5

1.0

1.5

2.0

2.5

3.0

Organic SILT

Brown SILT-SAND-GRAVEL. Unsorted, uncompacted, dry. (reworked TILL)

Medium to coarse grained SAND with some pebbles. Oxidized red.

Static water (est.)

Total depth - 3.04 m

KLOHN LEONOFF
CONSULTING ENGINEERS

JOB No.	PB 1836 0302
PROJECT	Afton Ajax Expansion
LOCATION	Kamloops, Jacko Lake
HOLE No.	TP 4
DATE	PLATE

TEST HOLE LOG

VERTICAL SCALE

SAMPLE DATA

HAMMER MASS kg

DROP HEIGHT m

DEPTH ELEV	O.D. I.D	BLOWS 0.3m	NO

SYMBOL

DATE DRILLED 2/29/88

DRILL TYPE Backhoe

ELEVATION GROUND 892

CO-ORD. LOCATION N4191; E4540

PIEZOMETER DETAILS

COHESION kPa

10 30 50 70 90

● FIELD VANE △LAB VANE ■UNCONF

PLASTIC LIMIT | WATER CONTENT | LIQUID LIMIT

X ———— O ———— X

10 30 50 70 90%

DESCRIPTION OF MATERIAL

(m)

0.5 — Organic SILT

1.0 — Brown SILT-SAND-GRAVEL. Unsorted, uncompacted, dry (reworked TILL).

1.5

2.0 — Red SAND to SILT. Some pebbles in the sand. Grades to silt at bottom.

2.5 — Static water level (est.)

Blue SAND-GRAVEL. Free water.

3.0 — Total depth - 3.35 m

Falling head test.

3.5 — ($K=3.6 \times 10^{-4}$ cm/s)

KLOHN LEONOFF CONSULTING ENGINEERS

JOB No.	PB 1836 0302
PROJECT	Afton Ajax Expansion
LOCATION	Kamloops, Jacko Lake
HOLE No.	TP 5
DATE	PLATE

TEST HOLE LOG

VERTICAL SCALE

SAMPLE DATA

HAMMER MASS kg

DROP HEIGHT m

DEPTH ELEV	O.D I.D	BLOWS 0.3m	NO

SYMBOL

DATE DRILLED 2/29/88

DRILL TYPE Backhoe

ELEVATION GROUND 890

CO-ORD. LOCATION N4222; E4563

PIEZOMETER DETAILS

COHESION kPa

10 30 50 70 90

● FIELD VANE △ LAB VANE ■ UNCONF

PLASTIC LIMIT | WATER CONTENT | LIQUID LIMIT

X ———— O ———— X

10 30 50 70 90%

DESCRIPTION OF MATERIAL

(m)

0.5

1.0

1.5

2.0

2.5

Organic SILT

Brown SILT-SAND with gravel. Unsorted, uncompacted (reworked TILL).

Red medium to coarse SAND. Well sorted, bedded, damp.

Green-gray SILT with clay.

Blue SILT-SAND-GRAVEL WITH SOME clay. (TILL)

Total depth = 2.6 m

KLOHN LEONOFF
CONSULTING ENGINEERS

JOB No.	PB 1836 0302
PROJECT	Afton Ajax Expansion
LOCATION	Kamloops, Jacko Lake
HOLE No.	TP 6
DATE	PLATE

TEST HOLE LOG

VERTICAL SCALE

SAMPLE DATA

HAMMER MASS kg

DROP HEIGHT m

DEPTH ELEV	O.D. I.D.	BLOWS 0.3m	NO.

SYMBOL

DATE DRILLED 2/29/88

DRILL TYPE Backhoe

ELEVATION GROUND 894

CO-ORD LOCATION N4247; E4578

PIEZOMETER DETAILS

COHESION kPa

10 30 50 70 90

● FIELD VANE △ LAB VANE ■ UNCONF

PLASTIC LIMIT | WATER CONTENT | LIQUID LIMIT

X ———— O ———— X

10 30 50 70 90%

DESCRIPTION OF MATERIAL

(m)

0.5

1.0

1.5

2.0

2.5

3.0

3.5

4.0

Brown SILT-SAND-GRAVEL.
Dry, loose, unsaturated. Some boulders (reworked TILL).

Brown SILT-SAND with clay and gravel, compact, dense.
Dry (glacial TILL)

Total depth = 3.9 m

KLOHN LEONOFF
CONSULTING ENGINEERS

JOB No.	PB 1836 0302
PROJECT	Afton Ajax Expansion
LOCATION	Kamloops, Jacko Lake
HOLE No.	TP 7
DATE	PLATE

TEST HOLE LOG

VERTICAL SCALE

SAMPLE DATA

HAMMER MASS kg

DROP HEIGHT m

DEPTH ELEV	O D / I D	BLOWS 0 3m	NO	SYMBOL

DATE DRILLED 3/2/88

DRILL TYPE Backhoe

ELEVATION GROUND 937

CO-ORD LOCATION N4981; E5202

PIEZOMETER DETAILS

COHESION kPa

10 30 50 70 90

● FIELD VANE △ LAB VANE ■ UNCONF

PLASTIC LIMIT | WATER CONTENT | LIQUID LIMIT

X ———— O ———— X

10 30 50 70 90%

DESCRIPTION OF MATERIAL

(m)

0.5

1.0

1.5

2.0

2.5

3.0

Organic SILT

Brown, SILT-SAND with clay and some gravels to boulders.
Dense, dry, compact (TILL)

Blue-grey SILT-SAND with some gravel, damp, medium dense.

(TILL)

Total depth = 3.0 m

KLOHN LEONOFF
CONSULTING ENGINEERS

JOB No.	PB 1836 0302
PROJECT	Afton Ajax Expansion
LOCATION	Kamloops, Jacko Lake
HOLE No.	TP 8A
DATE	PLATE

TEST HOLE LOG

VERTICAL SCALE

SAMPLE DATA

HAMMER MASS kg

DROP HEIGHT m

DEPTH ELEV	O.D. I.D	BLOWS 0.3m	NO	SYMBOL

DATE DRILLED 3/2/88

DRILL TYPE Backhoe

ELEVATION GROUND 937

CO-ORD LOCATION N4992; E5253

PIEZOMETER DETAILS

COHESION kPa

10 30 50 70 90

● FIELD VANE △ LAB VANE ■ UNCONF

PLASTIC LIMIT | WATER CONTENT | LIQUID LIMIT

X ———— O ———— X

10 30 50 70 90%

DESCRIPTION OF MATERIAL

(m)

0.5

1.0

1.5

2.0

2.5

Organic loam.

Light tan SILT-CLAY with minor gravel. Damp, dense, compact. Root casts.

Fine SAND with minor gravel. Damp.

Blue-gray SILT-SAND with gravel and clay. Dense, damp. (TILL)

Total depth = 2.4 m.

Bedrock

Falling Head Test ($K = 2.1 \times 10^{-5}$ cm/s)

KLOHN LEONOFF
CONSULTING ENGINEERS

JOB No.	PB 1836 0302
PROJECT	Afton Ajax Expansion
LOCATION	Kamloops, Jacko Lake
HOLE No.	TP 88
DATE	PLATE

TEST HOLE LOG

VERTICAL SCALE

SAMPLE DATA

HAMMER MASS kg

DROP HEIGHT m

DEPTH ELEV | O.D. I.D. | BLOWS 0.3m | NO | SYMBOL

DATE DRILLED 3/2/88

DRILL TYPE Backhoe

ELEVATION GROUND 940

CO-ORD LOCATION N5369; E5279

PIEZOMETER DETAILS

COHESION kPa

10 30 50 70 90

● FIELD VANE △ LAB VANE ■ UNCONF

PLASTIC LIMIT | WATER CONTENT | LIQUID LIMIT

X ———— O ———— X

10 30 50 70 90%

DESCRIPTION OF MATERIAL

(m)

0.5

1.0

1.5

2.0

2.5

3.0

Organic SILT

Light brown SILT-SAND-GRAVEL, uncompacted, loose, Lenses of gravel. (reworked TILL)

Light brown SILT-SAND-GRAVEL with clay. Dense, damp. (TILL)

Minor water seepage.

Blue-grey SILT-SAND with clay and gravel. Dense, damp (TILL).

Total depth = 3.3 m

KLOHN LEONOFF
CONSULTING ENGINEERS

JOB No.	PB 1836 0302
PROJECT	Afton Ajax Expansion
LOCATION	Kamloops, Jacko Lake
HOLE No.	TP 9
DATE	PLATE

TEST HOLE LOG

VERTICAL SCALE

SAMPLE DATA

HAMMER MASS kg

DROP HEIGHT m

DEPTH ELEV (m)	O.D I.D	BLOWS 0.3m	NO

SYMBOL

DATE DRILLED 3/1/88

DRILL TYPE Backhoe

ELEVATION GROUND 888

CO-ORD LOCATION N4122; E5473

PIEZOMETER DETAILS

COHESION kPa

10 30 50 70 90

● FIELD VANE △ LAB VANE ■ UNCONF

PLASTIC LIMIT X — WATER CONTENT O — LIQUID LIMIT X

10 30 50 70 90%

DESCRIPTION OF MATERIAL

0.0 — Organic SILT

0.5 — Light brown SILT-SAND-GRAVEL, minor clay, loose, Dry. (reworked TILL)

1.0

1.5 — Medium to coarse SAND with some gravel. Well graded. Water seepage at 2.5 m.

2.0

2.5 — Blue-grey dense SILT-SAND with gravel (TILL).

3.0 — Total depth = 2.7 m.

KLOHN LEONOFF
CONSULTING ENGINEERS

JOB No.	PB 1836 0302
PROJECT	Afton Ajax Expansion
LOCATION	Kamloops, Jacko Lake
HOLE No.	TP 10
DATE	PLATE

KLOHN LEONOFF

PAGE B-1160

TEST HOLE LOG

VERTICAL SCALE

SAMPLE DATA

HAMMER MASS kg

DROP HEIGHT m

DEPTH ELEV	O.D. I.D.	BLOWS 0.3m	NO

SYMBOL

DATE DRILLED 3/1/88

DRILL TYPE Backhoe

ELEVATION GROUND 892

CO-ORD. LOCATION N4167; E5767

PIEZOMETER DETAILS

COHESION kPa

10 30 50 70 90

● FIELD VANE △ LAB VANE ■ UNCONF

PLASTIC LIMIT | WATER CONTENT | LIQUID LIMIT

X ———— O ———— X

10 30 50 70 90%

DESCRIPTION OF MATERIAL

(m)

0.5

1.0

1.5

2.0

2.5

3.0

Organic SILT

Light brown SILT-SAND with some gravel. Loose, dry (reworked TILL).

Light brown, dense SILT-SAND-GRAVEL, dry (TILL).

Falling Head Test
($K = 5.7 \times 10^{-6}$ cm/s)

Total depth 3.0 m.

KLOHN LEONOFF
CONSULTING ENGINEERS

JOB No.	PB 1836 0302
PROJECT	Afton Ajax Expansion
LOCATION	Kamloops, Jacko Lake
HOLE No.	TP 11
DATE	PLATE

TEST HOLE LOG

VERTICAL SCALE

SAMPLE DATA

HAMMER MASS kg

DROP HEIGHT m

DEPTH ELEV	O.D. I.D.	BLOWS 0.3m	NO.	SYMBOL

DATE DRILLED 3/1/88

DRILL TYPE Backhoe

ELEVATION GROUND 884

CO-ORD. LOCATION N4186; E6009

PIEZOMETER DETAILS

COHESION kPa

10 30 50 70 90

● FIELD VANE △ LAB VANE ■ UNCONF

PLASTIC LIMIT | WATER CONTENT | LIQUID LIMIT

X ———— O ———— X

10 30 50 70 90%

DESCRIPTION OF MATERIAL

(m)

0.5

1.0

1.5

2.0

2.5

Organic SILT

Light brown, unconsolidated SILT-SAND-GRAVEL, damp (reworked TILL).

Red, medium to coarse SAND with cobbles and pebbles. Damp. Soft.

Blue-green, fine to medium SAND. Water seepage. Soft.

Total depth = 2.6 m.

KLOHN LEONOFF
CONSULTING ENGINEERS

JOB No.	PB 1836 0302
PROJECT	Afton Ajax Expansion
LOCATION	Kamloops, Jacko Lake
HOLE No.	TP 12
DATE	PLATE

TEST HOLE LOG

VERTICAL SCALE

SAMPLE DATA

HAMMER MASS kg

DROP HEIGHT m

DEPTH ELEV	O.D. I.D.	BLOWS 0.3m	NO

SYMBOL

DATE DRILLED 3/2/88

DRILL TYPE Backhoe

ELEVATION GROUND 882

CO-ORD. LOCATION N3970; E6526

PIEZOMETER DETAILS

COHESION kPa

10 30 50 70 90

● FIELD VANE △ LAB VANE ■ UNCONF

PLASTIC LIMIT | WATER CONTENT | LIQUID LIMIT

X ———— O ———— X

10 30 50 70 90%

DESCRIPTION OF MATERIAL

(m)

0.5

1.0

1.5

2.0

2.5

Organic SILT

Medium grey SAND-GRAVEL.
Water seepage, soft.

Light blue SILT-CLAY with minor gravel. Dense, damp (TILL).

Blue SILT with organic blobs. Hard, damp.
Total depth = 2.3 m.

KLOHN LEONOFF
CONSULTING ENGINEERS

JOB No.	PB 1836 0302
PROJECT	Afton Ajax Expansion
LOCATION	Kamloops, Jacko Lake
HOLE No.	TP 14A
DATE	PLATE

TEST HOLE LOG

VERTICAL SCALE

SAMPLE DATA

HAMMER MASS kg

DROP HEIGHT m

DEPTH ELEV	O.D. I.D.	BLOWS 0.3m	NO

SYMBOL

DATE DRILLED 3/2/88

DRILL TYPE Backhoe

ELEVATION GROUND 882

CO-ORD. LOCATION N4006; E6561

PIEZOMETER DETAILS

COHESION kPa

10 30 50 70 90

● FIELD VANE △ LAB VANE ■ UNCONF

PLASTIC LIMIT | WATER CONTENT | LIQUID LIMIT

X ———— O ———— X

10 30 50 70 90%

DESCRIPTION OF MATERIAL

(m)	
0.5	Organic SILT
1.0	Brown SILT with fine sand and gravel. Soft. Dry.
1.5	Interbedded light brown and light tan SILT-CLAY. Stiff. Damp
2.0	Very fine SAND to SILT. Brown, damp, stiff.
2.5	Blue SILT. Damp, hard.
	Total depth = 2.7 m.

KLOHN LEONOFF
CONSULTING ENGINEERS

JOB No.	PB 1836 0302
PROJECT	Afton Ajax Expansion
LOCATION	Kamloops, Jacko Lake
HOLE No.	TP 14B
DATE	PLATE

TEST HOLE LOG

VERTICAL SCALE

SAMPLE DATA

HAMMER MASS kg

DROP HEIGHT m

DEPTH ELEV	O.D. I.D	BLOWS 0.3m	NO

SYMBOL

DATE DRILLED 3/1/88

DRILL TYPE Backhoe

ELEVATION GROUND 897

CO-ORD. LOCATION N3891; E6278

DESCRIPTION OF MATERIAL

PIEZOMETER DETAILS

COHESION kPa

10 30 50 70 90

● FIELD VANE △ LAB VANE ■ UNCONF

PLASTIC LIMIT | WATER CONTENT | LIQUID LIMIT

X ———— O ———— X

10 30 50 70 90%

(m)

0.5

1.0

1.5

2.0

2.5

3.0

3.5

4.0

Brown SILT-CLAY-GRAVEL.
Dense, dry to damp at base.
(Glacial TILL)

Total depth 3.7 m.

KLOHN LEONOFF
CONSULTING ENGINEERS

JOB No.	PB 1836 0302
PROJECT	Afton Ajax Expansion
LOCATION	Kamloops, Jacko Lake
HOLE No.	TP 15
DATE	PLATE

TEST HOLE LOG

VERTICAL SCALE

SAMPLE DATA

HAMMER MASS kg

DROP HEIGHT m

DEPTH ELEV	O.D. I.D	BLOWS 0.3m	NO

SYMBOL

DATE DRILLED 3/1/88

DRILL TYPE Backhoe

ELEVATION GROUND 912

CO-ORD. LOCATION N3651; E5871

PIEZOMETER DETAILS

COHESION kPa

10 30 50 70 90

● FIELD VANE △ LAB VANE ■ UNCONF

PLASTIC LIMIT | WATER CONTENT | LIQUID LIMIT

X ———— O ———— X

10 30 50 70 90%

DESCRIPTION OF MATERIAL

(m)

0.5

1.0

1.5

2.0

2.5

3.0

3.5

4.0

Organic SILT

Brown SILT with minor gravel, stiff, damp.

Light brown SILT-SAND-GRAVEL with some clay, soft, water seepage. Seams of SAND-GRAVEL. (TILL)

Total depth = 3.9 m.

KLOHN LEONOFF
CONSULTING ENGINEERS

JOB No.	PB 1836 0302
PROJECT	Afton Ajax Expansion
LOCATION	Kamloops, Jacko Lake
HOLE No.	TP 16
DATE	PLATE

TEST HOLE LOG

VERTICAL SCALE

SAMPLE DATA

HAMMER MASS kg

DROP HEIGHT m

DEPTH ELEV	O D / I D	BLOWS 0.3m	NO	SYMBOL

DATE DRILLED 3/1/88

DRILL TYPE Backhoe

ELEVATION GROUND 913

CO-ORD LOCATION N3252; E5883

PIEZOMETER DETAILS

COHESION kPa

10 30 50 70 90

● FIELD VANE △ LAB VANE ■ UNCONF

PLASTIC LIMIT | WATER CONTENT | LIQUID LIMIT

X ———— O ———— X

10 30 50 70 90%

DESCRIPTION OF MATERIAL

(m)

0.5

1.0

1.5

2.0

2.5

3.0

Organic SILT

SILT loam. Brown, dry and stiff.

Yellow-grey SILT-CLAY with gravel.
Damp, dense (TILL).

Blue-grey SILT-CLAY-GRAVEL.
Damp, dense (TILL).

Total depth = 3.2 m.

KLOHN LEONOFF
CONSULTING ENGINEERS

JOB No.	PB 1836 0302
PROJECT	Afton Ajax Expansion
LOCATION	Kamloops, Jacko Lake
HOLE No.	TP 17
DATE	PLATE

TEST HOLE LOG

VERTICAL SCALE

SAMPLE DATA

HAMMER MASS kg

DROP HEIGHT m

DEPTH ELEV	O D / I D	BLOWS 0.3m	NO

SYMBOL

DATE DRILLED 3/1/88

DRILL TYPE Backhoe

ELEVATION GROUND 889

CO-ORD LOCATION N3973; E5223

PIEZOMETER DETAILS

COHESION kPa

10 30 50 70 90

● FIELD VANE △ LAB VANE ■ UNCONF

PLASTIC LIMIT WATER CONTENT LIQUID LIMIT

X ———— O ———— X

10 30 50 70 90%

DESCRIPTION OF MATERIAL

(m)

0.5

1.0

1.5

2.0

2.5

3.0

Organic SILT

Loose unconsolidated SILT-SAND-GRAVEL with trace clay. Dry.

Grey SAND-GRAVEL, loose, damp.

Grey fine SAND to SILT.
Damp, stiff to hard.

Blue-grey SILT-CLAY with gravel.
Damp, dense (TILL).

Total depth = 3.3 m.

KLOHN LEONOFF
CONSULTING ENGINEERS

JOB No.	PB 1836 0302
PROJECT	Afton Ajax Expansion
LOCATION	Kamloops, Jacko Lake
HOLE No.	TP 18
DATE	PLATE

TEST HOLE LOG

VERTICAL SCALE

SAMPLE DATA

HAMMER MASS kg

DROP HEIGHT m

DEPTH / ELEV	C D / I D	BLOWS / 0.3m	NO

SYMBOL

DATE DRILLED 3/1/88

DRILL TYPE Backhoe

ELEVATION GROUND 910

CO-ORD LOCATION N3879; E6043

DESCRIPTION OF MATERIAL

PIEZOMETER DETAILS

COHESION kPa

10 30 50 70 90

● FIELD VANE △ LAB VANE ■ UNCONF

PLASTIC LIMIT | WATER CONTENT | LIQUID LIMIT

X ———— O ———— X

10 30 50 70 90%

(m)	DESCRIPTION OF MATERIAL
0.5	Light brown SILT-CLAY with gravel and boulders, damp, dense (Glacial TILL)
1.0	
1.5	
2.0	
2.5	
3.0	Total depth = 3.0 m

KLOHN LEONOFF
CONSULTING ENGINEERS

JOB No.	PB 1836 0302
PROJECT	Afton Ajax Expansion
LOCATION	Kamloops, Jacko Lake
HOLE No.	TP 19
DATE	PLATE

TEST HOLE LOG

VERTICAL SCALE

SAMPLE DATA

HAMMER MASS kg

DROP HEIGHT m

DEPTH ELEV	O.D. I.D	BLOWS 0.3m	NO

SYMBOL

DATE DRILLED 3/1/88

DRILL TYPE Backhoe

ELEVATION GROUND 897

CO-ORD LOCATION N3848; E5028

PIEZOMETER DETAILS

COHESION kPa

10 30 50 70 90

● FIELD VANE △ LAB VANE ■ UNCONF

PLASTIC LIMIT | WATER CONTENT | LIQUID LIMIT

X ———— O ———— X

10 30 50 70 90%

DESCRIPTION OF MATERIAL

(m)

0.5

1.0

1.5

2.0

2.5

3.0

3.5

4.0

Organic SILT

Light grey to white organic CLAY. Very soft, saturated, snail shells in layers. Free water.

Light brown CLAY. Soft, saturated, plastic.

Blue CLAY with boulders. Wet, plastic, soft.

Total depth = 3.7 m.

KLOHN LEONOFF
CONSULTING ENGINEERS

JOB No.	PB 1836 0302
PROJECT	Afton Ajax Expansion
LOCATION	Kamloops, Jacko Lake
HOLE No.	TP 20
DATE	PLATE

APPENDIX C
COMPILED WRBC BOREHOLE LOG DATA

Table C-1. Selected WRBC Borehole Log Data Complied for Cross Section Interpretation

Water Well ID	Lithology				Notes
	Depth from (m)	Depth To (m)	Unit	Description	
29234	0	0.3	TOPSOIL	topsoil	
	0.3	0.9	BOULDERS	boulders	
	0.9	8.5	TILL	till, boulders	
	8.5	8.8	GRAVEL	coarse gravel	
	8.8	10.1	TILL	dense till	
	10.1	10.7	GRAVEL	water-bearing gravel	
	10.7	11.6	TILL	till	
	11.6	12.5	GRAVEL	water-bearing gravel	
	12.5	14.0	BOULDERS	boulders	
	14.0	14.6	GRAVEL	w.b. gravel	
	14.6	15.8	TILL	till	
	15.8	16.8	GRAVEL	gravel	
	16.8	18.9	TILL	dense till	
	18.9	20.7	BOULDERS	boulders	
	20.7	21.6	TILL	till	
	21.6	21.9	GRAVEL	gravel	
	21.9	22.9	TILL	till	
	22.9	23.5	GRAVEL	gravel	
	23.5	25.3	TILL	till	
	25.3	27.7	SILTY SAND	silty sands	
	27.7	29.9	GRAVEL	gravel	
	29.9	31.1	SILTY GRAVEL	silty gravel	
	31.1	32.9	TILL	till	
	32.9	35.4	SILT	gray silt	
	35.4	43.3	GRAVEL	gravel	
	43.3	46.3	SILT	silt	
	46.3	48.8	SAND	fine slaty sand	
	48.8	59.7	SILT/COBBLES	silt cobbles above bedrock	
	59.7	61.0	BEDROCK	bedrock	
51601	0	3.0	SAND/GRAVEL	soil, sand gravel	
	3.0	9.1	GRAVEL/SAND/CLAY	gravel, sand clay	
	9.1	13.7	CLAY	clay (orange)	
	13.7	18.3	CLAY	clay (red-brown)	
	18.3	22.9	CLAY	clay	
	22.9	27.4	BEDROCK	soft bedrock (volcanic)	
	27.4	30.5	BEDROCK	hard and soft bedrock	
	30.5	36.6	BEDROCK	hard bedrock	
	36.6	42.7	BEDROCK	soft bedrock	
	42.7	45.7	BEDROCK	" " (red)	
	45.7	51.8	BEDROCK	" " (gray)	
	51.8	54.9	BEDROCK	" " (gray and red)	
	54.9	57.9	BEDROCK	" " (gray, some water)	
	57.9	60.4	BEDROCK	" " (red)	
	60.4	64.0	BEDROCK	soft bedrock (gray)	
	64.0	85.3	BEDROCK	hard bedrock (gray)	

Table C-1. Selected WRBC Borehole Log Data Complied for Cross Section Interpretation

Water Well ID	Lithology				Notes
	Depth from (m)	Depth To (m)	Unit	Description	
29197	0.0	0.3	TOPSOIL	topsoil	
	0.3	1.5	TILL	till	
	1.5	7.3	TILL/BOULDERS	till with boulders	
	7.3	20.4	TILL/BOULDERS	dense till, some boulders	
	20.4	27.4	BEDROCK	bedrock	
4438				NO LOG PROVIDED	
58643	0.0	9.1	OVERBURDEN	overburden	
	9.1	80.5	BEDROCK	bedrock	
44792	0.0	1.5	OVERBURDEN	overburden	
	1.5	7.3	BEDROCK	bedrock	
	7.3	9.4	FAULT ZONE	fractured bedrock	
	9.4	37.2	BEDROCK	bedrock	
	37.2	37.5	FAULT ZONE	fractured bedrock	
	37.5	53.3	BEDROCK	bedrock	
14817	0.0	1.2	TOPSOIL	black loam	
	1.2	6.4	CLAY	yellow clay, some gravel	
	6.4	10.4	GRAVEL/CLAY	gravel filled with sedimentry clay	
	10.4	11.6	CLAY	sedimentry clay	
	11.6	19.8	CLAY/GRAVEL	sedimentry clay, well filled with gravel	
	0.0	0.0	CLAY/GRAVEL	and stones	
	19.8	22.6	CLAY	sediments	
	22.6	29.3	CLAY/GRAVEL	sediments and gravel firmly packed	
	29.3	30.8	CLAY/GRAVEL	gravel and sediments	
	30.8	31.1	BEDROCK	diorites	
18637	0.0	12.2	SILTY SAND	silty sand and some gravel	
	12.2	16.5	CLAY/SILT	hardpan	
	16.5	28.7	SILT/SAND	silt, sand and a little gravel	
	28.7	32.0	CLAY/SILT	hardpan	

Table C-1. Selected WRBC Borehole Log Data Complied for Cross Section Interpretation

Water Well ID	Lithology				Notes
	Depth from (m)	Depth To (m)	Unit	Description	
14806	0.0	0.9	TOPSOIL	surface soil	
	0.9	8.5	CLAY/GRAVEL	firm clay and gravel	
	8.5	9.1	SAND	fine sand	
	9.1	11.6	GRAVEL	hard firm gravel	
	11.6	11.9	BOULDERS	boulder	
	11.9	27.1	SAND	loose sand	
	27.1	29.3	SILT/SAND/ BOULDERS	silt, sand, boulder at 96'	
	29.3	33.2	GRAVELLY CLAY	gravelly clay	
	33.2	39.3	GRAVEL/SAND	gravel sand silted	
	39.3	40.8	CLAY	yellow clay	
	40.8	41.1	CLAY	white clay	
	41.1	47.9	BEDROCK	volcanic cap rock	
	47.9	56.1	BEDROCK	volcanic rock and glacial clay	
	56.1	73.2	BEDROCK	volcanic breccia	
	73.2	73.8	BEDROCK	fractured rock, some water	
	73.8	74.4	BEDROCK	volcanic tuff	
	74.4	79.9	BEDROCK	volcanic rock	
	79.9	93.3	BEDROCK	volcanics	
	93.3	97.5	FAULT ZONE	silt, clay	
	97.5	103.0	BEDROCK	black material, bits of coal	
	103.0	112.8	BEDROCK	volcanic rock	
	112.8	114.0	FAULT ZONE	clay and gravel	
	114.0	115.8	BEDROCK	volcanic purple tuff	
	115.8	121.3	FAULT ZONE	clay volcanic sediments	
	121.3	128.0	FAULT ZONE	gravel firm	
	128.0	131.1	FAULT ZONE	silted sediments	
	131.1	132.9	BEDROCK	diorites	
87298	0.0	0.5	FILL	FILL fill	
	0.5	2.3	BEDROCK	TUFF/AGGLOMERATE	
	2.3	7.7	BEDROCK	VOLCANIC BRECCIA breccia	
	7.7	15.5	BEDROCK	VOLCANIC GREENSTONE	
	15.5	17.2	BEDROCK	VOLCANIC BRECCIA breccia	

Table C-1. Selected WRBC Borehole Log Data Complied for Cross Section Interpretation

Water Well ID	Lithology				Notes
	Depth from (m)	Depth To (m)	Unit	Description	
87299	0.0	1.3	FILL	FILL fill	
	1.3	3.0	TILL	TILL till	
	3.0	4.9	BEDROCK	TUFF/AGGLOMERATE	
	4.9	6.3	BEDROCK	VOLCANIC BRECCIA breccia	
	6.3	12.1	BEDROCK	VOLCANIC GREENSTONE	
	12.1	12.6	BEDROCK	VOLCANIC BRECCIA breccia	
	12.6	14.4	BEDROCK	VOLCANIC GREENSTONE	
	14.4	14.8	BEDROCK	TUFF/AGGLOMERATE	
	14.8	17.2	BEDROCK	VOLCANIC GREENSTONE	
23062	0.0	12.2	SAND	dry sand	
	12.2	13.7	TILL	till	
	13.7	22.3	SANDY TILL	sandy - till, some water at 60 ft	
	22.3	30.8	SILT	black sticky gumbo	
	30.8	37.2	TILL	hard till	
	37.2	50.6	TILL	till	
	50.6	51.5	TILL	sticky till	
4248					Abandoned test hole
10	0.0	11.0	OVERBURDEN		
	11.0	121.9	BEDROCK		
59938	0.0	1.2	SILTY SAND/GRAVEL	brown silty sand and gravel	
	1.2	9.8	SAND/GRAVEL/ COBBLES	brown sand, gravel and cobbles	
	9.8	14.6	CLAY/GRAVEL	grey cemented clat and rocks	
	14.6	15.8	CLAY/GRAVEL	brown clay with rocks	
	15.8	85.3	BEDROCK	grey volcanic rock	
	85.3	97.5	BEDROCK	red volcanic rock	
	97.5	109.7	BEDROCK	grey and red volcanic rock	
	109.7	158.5	BEDROCK	grey and brown volcanic rock	

Table C-1. Selected WRBC Borehole Log Data Complied for Cross Section Interpretation

Water Well ID	Lithology				Notes
	Depth from (m)	Depth To (m)	Unit	Description	
60301	0.0	7.6	CLAY/GRAVEL	clay and rocks	
	7.6	18.3	TILL	till and rocks	
	18.3	24.4	CLAY	clay	
	24.4	28.3	GRAVEL	dry gravel	
	28.3	30.5	BEDROCK	brocken bedrock	
59107	0.0	10.7	CLAY/GRAVEL	clay and rocks	
	10.7	14.0	SILT/GRAVEL	silt and gravel	
	14.0	15.8	CLAY	clay	
	15.8	17.4	GRAVEL	clean gravel	
59081	0.0	14.0	CLAY/GRAVEL	clay and rocks	
	14.0	17.7	GRAVEL	gravel	
49022	0.0	12.5	CLAY/SIILT	HARDPAN	
	12.5	13.7	GRAVEL	WATER, GRAVEL	
58480	0.0	1.2	TOPSOIL	topsoil	
	1.2	2.1	GRAVEL	gravel	
	2.1	3.0	SAND/GRAVEL/CLAY	sand and gravel and clay	
	3.0	3.7	SAND/GRAVEL	sand and gravel	
	3.7	5.5	CLAY/GRAVEL	clay and gravel	
	5.5	6.7	CLAY	clay	
	6.7	7.3	CLAY/GRAVEL	clay and gravel	
	7.3	7.9	SAND/GRAVEL	sand and gravel	
	7.9	10.4	CLAY/GRAVEL	clay and gravel	
	10.4	17.4	BEDROCK	soft bedrock	
61255	0.0	1.5	CLAY/GRAVEL	CLAY AND ROCKS	
	1.5	9.1	SILT/SAND/GRAVEL	SILT AND SAND W/ ROCKS	
	9.1	12.2	SAND/GRAVEL	SAND AND GRAVEL	
	12.2	12.5	BEDROCK	BEDROCK	
58488	0.0	1.2	SANDY CLAY	sandy clay	
	1.2	1.8	GRAVEL	gravel	
	1.8	2.1	CLAY	clay and black soil	
	2.1	2.7	CLAY	clay	
	2.7	3.7	CLAY/GRAVEL	clay and gravel	
	3.7	5.2	SAND/GRAVEL/CLAY	sand, gravel and clay	
	5.2	7.0	CLAY	clay	
	7.0	7.9	CLAY/GRAVEL	clay and gravel	
	7.9	10.1	SAND/GRAVEL	sand and gravel	

Table C-1. Selected WRBC Borehole Log Data Complied for Cross Section Interpretation

Water Well ID	Lithology				Notes
	Depth from (m)	Depth To (m)	Unit	Description	
58476	0.0	0.9	TOPSOIL	topsoil	
	0.9	1.8	SAND/GRAVEL	sand and gravel	
	1.8	2.1	CLAY	powder clay	
	2.1	2.7	GRAVEL/BOULDERS	gravel and boulders	
	2.7	3.4	SAND/GRAVEL/ BOULDERS	sand gravel and boulders	
	3.4	7.0	CLAY/GRAVEL	clay and gravel	
	7.0	17.4	BEDROCK	very soft bedrock (cased)	
	17.4	182.0	BEDROCK	bedrock	
99251	0.0	1.8	SAND/GRAVEL	SAND & GRAVEL brown	
	1.8	5.2	CLAY/GRAVEL	CLAY & GRAVEL brown	
	5.2	6.4	CLAY	brown sticky clay	
	6.4	10.1	SAND/GRAVEL	S & G WITH SOME CLAY brown	
	10.1	11.3	SAND/GRAVEL	FINE TO COARSE SAND & GRAVEL brown	
58483	0.0	0.9	TOPSOIL	topsoil	
	0.9	1.2	CLAY	powder clay	
	1.2	1.8	SAND/GRAVEL/CLAY	sand gravel and clay	
	1.8	2.1	SAND/GRAVEL	sand and gravel	
	2.1	4.6	SAND/GRAVEL/CLAY	sand, gravel and clay	
	4.6	8.8	CLAY/GRAVEL	clay and gravel	
	8.8	8.8	BEDROCK	bedrock	
61609	0.0	3.0	CLAY, GRAVEL, SILT		
	3.0	9.1	CLAY/GRAVEL	CLAY, ROCKS	
	9.1	12.8	GRAVEL	GRAVEL	
	12.8	27.4	CLAY/GRAVEL	CLAY, GRAVEL, ROCKS	
	27.4	152.4	BEDROCK	BEDROCK	
58480	0.0	1.2	TOPSOIL	topsoil	
	1.2	2.1	GRAVEL	gravel	
	2.1	3.0	SAND/GRAVEL/CLAY	sand and gravel and clay	
	3.0	3.7	SAND/GRAVEL	sand and gravel	
	3.7	5.5	CLAY/GRAVEL	clay and gravel	
	5.5	6.7	CLAY	clay	
	6.7	7.3	CLAY/GRAVEL	clay and gravel	
	7.3	7.9	SAND/GRAVEL	sand and gravel	
	7.9	10.4	CLAY/GRAVEL	clay and gravel	
	10.4	17.4	BEDROCK	soft bedrock	

Table C-1. Selected WRBC Borehole Log Data Complied for Cross Section Interpretation

Water Well ID	Lithology				Notes
	Depth from (m)	Depth To (m)	Unit	Description	
61612	0.0	7.6	TILL	TILL	
	7.6	30.5	BEDROCK	BEDROCK	
61615	0.0	3.7	TILL		
	3.7	36.6	BEDROCK		
61248	0.0	3.0	SAND/GRAVEL		
	3.0	15.2	CLAY/GRAVEL		
	15.2	85.3	BEDROCK		
61607	0.0	13.7	GRAVEL/CLAY/ BOULDERS		
	13.7	152.4	BEDROCK		
61617	0.0	3.7	GRAVEL/CLAY		
	3.7	9.8	GRAVEL		
	9.8	9.8	BEDROCK		
61252	0.0	3.0	CLAY/GRAVEL		
	3.0	18.3	BEDROCK		
58483	0.0	0.9	TOPSOIL	topsoil	
	0.9	1.2	CLAY	powder clay	
	1.2	1.8	SAND/GRAVEL/CLAY	sand gravel and clay	
	1.8	2.1	SAND/GRAVEL	sand and gravel	
	2.1	4.6	SAND/GRAVEL/CLAY	sand, gravel and clay	
	4.6	8.8	CLAY/GRAVEL	clay and gravel	
	8.8	8.8	BEDROCK	bedrock	
51605	0.0	6.7	BOULDERS/SAND	soil boulders sand	
	6.7	18.3	BEDROCK	hard bedrock	
	18.3	24.4	BEDROCK	soft bedrock	
	24.4	42.7	BEDROCK	hard and soft bedrock (some water)	
35541	0.0	0.3	TOPSOIL	topsoil	
	0.3	1.2	FILL	fill	
	1.2	1.8	BOULDERS	boulder	
	1.8	4.6	TILL	till	
	4.6	7.3	BOULDERS	boulders	
	7.3	66.1	BEDROCK	bedrock	
29259	0.0	11.0	TILL	till with rocks	
	11.0	18.3	BOULDERS	boulders	
	18.3	25.3	TILL	dense till	
	25.3	64.6	CLAY	sticky clay	
	64.6	69.8	BOULDERS	boulders	
	69.8	76.2	BEDROCK	bedrocks	

Table C-1. Selected WRBC Borehole Log Data Complied for Cross Section Interpretation

Water Well ID	Lithology				Notes
	Depth from (m)	Depth To (m)	Unit	Description	
76521	0.0	1.8	TOPSOIL	TOPSOIL & GRAVEL	
	1.8	4.9	SAND/GRAVEL	SAND & GRAVEL WITH SOME BR CLAY	
	4.9	7.9	SANDY CLAY	SANDY BR CLAY WITH GRAVEL & COBBLES	
	7.9	15.8	SANDY CLAY	SANDY BLUE CLAY WITH COBBLES TILL	
	15.8	18.6	CLAY	HARD BLUE CLAY & TRACE OF GRAVEL	
	18.6	22.6	CLAY/GRAVEL/ COBBLES	BR CLAY & GRAVEL & COBBLES	
	22.6	213.4	BEDROCK	SOFT WEATHERED BEDROCK BLACK & GREEN	
32710	0.0	0.3	TOPSOIL	topsoil	
	0.3	32.0	TILL/BOULDERS	till with boulders	
	32.0	48.2	BEDROCK	crumbly bedrock	
	48.2	106.7	BEDROCK	layers of different bedrock	
	106.7	113.7	BEDROCK	bedrock	
	113.7	115.8	BEDROCK	crumbly bedrock	
31907	0.0	0.9	TOPSOIL		
	0.9	3.0	TILL/BOULDERS		
	3.0	35.1	BEDROCK		
31901	0.0	3.4	OVERBURDEN		
	3.4	42.7	BEDROCK		
31561	0.0	0.6	TOPSOIL		
	0.6	4.3	TILL/BOULDERS		
	4.3	25.9	BEDROCK		
84297	0.0	9.1	CLAY/GRAVEL		
	9.1	12.2	CLAY/GRAVEL		
	12.2	17.7	CLAY/GRAVEL		
	17.7	61.0	BEDROCK		
49694	0.0	18.3	CLAY/BOULDERS		
	18.3	44.2	BEDROCK		
31621	0.0	0.6	TOPSOIL		
	0.6	13.1	TILL/BOULDERS		
	13.1	39.6	BEDROCK		
51654	0.0	6.1	CLAY/GRAVEL	soil - clay - gravel	
	6.1	7.6	GRAVEL	gravel - rocks	
	7.6	24.4	BEDROCK	soft bedrock	
	24.4	30.5	BEDROCK	soft bedrock - some water	
	30.5	42.7	BEDROCK	hard bedrock	
	42.7	54.9	BEDROCK	soft bedrock - more water	
	54.9	85.3	BEDROCK	medium bedrock	

Table C-1. Selected WRBC Borehole Log Data Complied for Cross Section Interpretation

Water Well ID	Lithology				Notes
	Depth from (m)	Depth To (m)	Unit	Description	
98958	0.0	24.4	Not Logged		
	24.4	61.0	BEDROCK		
4389	0.0	0.3	TOPSOIL	topsoil	
	0.3	17.1	TILL/GRAVEL	till with rocks	
	17.1	20.4	SILTY CLAY	brown silty clay	
	20.4	22.9	SILTY CLAY	gray silty clay, a little gravel with water	
	22.9	36.0	SILT	pure silt	
	36.0	41.1	CLAY/PEBBLES	black, very sticky clay with pebbles	
	41.1	51.5	TILL/BOULDERS	brown till with boulders	
	51.5	53.0	SILTY CLAY/GRAVEL	gray silty clay with gravel	
	53.0	54.9	SILTY GRAVEL	tight silty water-bearing gravel	
	54.9	56.7	TILL	till with rocks	
	56.7	57.9	GRAVEL/BOULDERS	hard gravel with boulders, brown clay binder	
	57.9	64.6	CLAY/BOULDERS	brown clay with boulders (water)	
	64.6	68.6	BEDROCK	bedrock	
35485	0	0.3	TOPSOIL	topsoil	
	0.3	22.6	TILL/BOULDERS	till with boulders	
	22.6	22.9	GRAVEL	layer of w.b. gravel	
	22.9	29.0	TILL	very dense till	
	29.0	29.3	GRAVEL	layer of water-bearing gravel	
	29.3	32.9	TILL	dense till, layers of sticky clay with pebbles	
	32.9	41.1	TILL	very dense till	
	41.1	55.5	TILL/GRAVEL	till with rocks	
	55.5	60.7	CLAY	very tight water-bearing formation, brown clay binding	
	60.7	62.5	SANDY GRAVEL	ungraded sandy gravel (water)	
	62.5	64.0	CLAY	gray clay	

Table C-1. Selected WRBC Borehole Log Data Complied for Cross Section Interpretation

Water Well ID	Lithology				Notes
	Depth from (m)	Depth To (m)	Unit	Description	
27653	0.0	0.3	TOPSOIL	topsoil	
	0.3	3.4	TILL/GRAVEL	till with rocks	
	3.4	23.2	TILL/BOULDERS	till with boulders	
	23.2	25.0	SILTY CLAY/PEBBLES	silty clay with pebbles	
	25.0	31.1	SILTY CLAY/GRAVEL	silty clay with rocks	
	31.1	49.4	TILL/BOULDERS	till with boulders	
	49.4	50.0	TILL	brown till	
	50.0	56.4	GRAVEL	tight ungraded water-bearing gravel, brown clay binding	
	56.4	57.0	CLAY	sticky clay with (gravel, no water)	
41436	0.0	0.6	TOPSOIL	topsoil	
	0.6	3.0	TILL	till	
	3.0	9.8	BOULDERS	boulders	
	9.8	17.7	TILL	brown till	
	17.7	23.2	TILL	grey dense till	
	23.2	29.9	TILL	dense brown till	
	29.9	50.3	BEDROCK	bedrock	
	50.3	78.0	BEDROCK	medium hard bedrock	
	78.0	88.4	BEDROCK	hard unconsolidated bedrock	
	88.4	92.4	BEDROCK	consolidated bedrock	
27738	0.0	0.3	TOPSOIL		
	0.3	16.8	TILL/GRAVEL		
	16.8	32.6	TILL		
	32.6	35.7	GRAVEL		
	35.7	36.3	TILL		
98093	0.0	0.9	SILT	Medium brown silt	
	0.9	6.4	CLAY/TILL	Dense CLAY & GR TILL brown	
	6.4	11.6	CLAY	Medium brown clay	
	11.6	28.7	CLAY/TILL	Dense CLAY & GR TILL WITH SOME BOULDERS brown	
	28.7	33.2	BEDROCK	Medium VOLCANIC BEDROCK green	
	33.2	47.5	BEDROCK	Medium VOLCANIC BEDROCK WITH WHITE QUARTZ green	
	47.5	111.3	BEDROCK	Medium VOLCANIC BEDROCK 2 Gallons per Minute (U.S./Imperial)	
	111.3	150.0	BEDROCK	Medium VOLCANIC BEDROCK 4 Gallons per Minute (U.S./Imperial)	

Table C-1. Selected WRBC Borehole Log Data Complied for Cross Section Interpretation

Water Well ID	Lithology				Notes
	Depth from (m)	Depth To (m)	Unit	Description	
33452	0.0	0.6	TOPSOIL		
	0.6096	8.2296	TILL/BOULDERS		
	8.2296	45.72	BEDROCK		
59954	0	6.096	CLAY/GRAVEL	clay and rocks	
	6.096	9.144	SAND/GRAVEL	sand and gravel	
	9.144	21.336	CLAY/SILT	clay and silt	
	21.336	30.48	BEDROCK	soft bedrock	
	30.48	73.152	BEDROCK	bedrock	
59653				NOT LOGGED	
61270	0	13.716	CLAY/GRAVEL		
	13.716	42.672	BEDROCK		
61271	0	11.2776	CLAY/GRAVEL		
	11.2776	12.192	GRAVEL		
	12.192	60.96	BEDROCK		
61269	0	4.572	SAND/GRAVEL	SAND AND GRAVEL	
	4.572	10.668	CLAY/ROCKS	CLAY AND ROCKS	
	10.668	60.96	BEDROCK	BLUE GREY BEDROCK	
	60.96	67.056	BEDROCK	WHITE BEDROCK	
104822	0	1.524	SILT	Loose DRY brown silt	
	1.524	3.048	CLAY	Loose MOIST brown clay	
	3.048	9.144	CLAY/SAND/GRAVEL	Loose CLAY & SAND W/ GRAVEL DRY brown	
	9.144	12.4968	SILT	Loose DRY brown silt	
	12.4968	16.1544	TILL	Loose DRY grey dark-coloured till	
	16.1544	17.3736	BOULDERS	Very hard DRY grey light-coloured boulders	
	17.3736	19.2024	SILT/SAND/GRAVEL	Loose SILT & SAND W/ GRAVEL MOIST grey light-coloured	
	19.2024	25.2984	SILT	Loose DRY grey light-coloured silt	
	25.2984	29.5656	CLAY	Loose DRY grey light-coloured clay	
	29.5656	35.052	CLAY	Loose DRY brown clay	
	35.052	56.0832	CLAY	Loose DRY brown clay	
	56.0832	121.92	BEDROCK	Very hard DRY grey bedrock	
2572				NOT LOGGED	

Table C-1. Selected WRBC Borehole Log Data Complied for Cross Section Interpretation

Water Well ID	Lithology				Notes
	Depth from (m)	Depth To (m)	Unit	Description	
104821	0	1.8288	SAND/GRAVEL	Loose SAND W GRAVEL DRY brown	
	1.8288	6.7056	CLAY	Dense MOIST brown clay	
	6.7056	9.144	CLAY/SILT/GRAVEL	Loose CLAY & SILT, W/ ROCK MOIST brown	
	9.144	18.8976	TILL	Loose DRY, BROWN & LIGHT GREY vari-coloured till	
	18.8976	20.7264	CLAY	Dense MOIST brown clay	
	20.7264	32.004	TILL	Loose DRY brown till	
	32.004	38.1	SAND/GRAVEL	Loose SAND W/ GRAVEL MOIST brown	
	38.1	42.672	BEDROCK	Very hard DRY grey light-coloured bedrock	
61266	0	4.572	SANDY CLAY	SANDY CLAY	
	4.572	9.144	GRAVEL	GRAVEL	
	9.144	24.384	CLAY/GRAVEL	CLAY AND ROCKS	
	24.384	30.48	SAND	SAND	
	30.48	45.72	CLAY/GRAVEL	CLAY AND ROCKS	
	45.72	50.292	BEDROCK	WHITE GYPSUM BEDROCK	
	50.292	51.816	BEDROCK	ERODED BEDROCK	
	51.816	85.344	BEDROCK	BEDROCK	
1322				NOT LOGGED	
84292	0	5.4864	CLAY/GRAVEL/ BOULDERS		
	5.4864	12.8016	CLAY/ROCKS/ BOULDERS		
	12.8016	158.496	BEDROCK		
84992	0	6.096	SAND/CLAY/ BOULDERS	SAND CLAY BOULDERS WITH BOULDERS sandy clay	
	6.096	27.432	SAND/GRAVEL	SAND GRAVEL sandy gravel	
	27.432	28.3464	BOULDERS	ROCK BOULDER bouldery rock	
	28.3464	28.6512	CLAY	CLAY clay	
	28.6512	41.148	SAND/GRAVEL	SAND GRAVEL sandy gravel	
	41.148	128.016	BEDROCK	BEDROCK bedrock	

Table C-1. Selected WRBC Borehole Log Data Complied for Cross Section Interpretation

Water Well ID	Lithology				Notes
	Depth from (m)	Depth To (m)	Unit	Description	
51634	0	6.1	OVERBURDEN	NOT LOGGED	
	6.1	6.1	BEDROCK		
54338	0	6.1	CLAY	soil clay rock	
	6.1	12.2	GRAVEL	gravel and rocks	
	12.2	13.7	GRAVEL	soft rocks	
	13.7	18.3	BEDROCK	hard bedrock	
	18.3	19.8	BEDROCK	soft bedrock	
	19.8	61.0	BEDROCK	hard bedrock	
	61.0	67.1	BEDROCK	soft bedrock of 205', some water 1 1/2 gpm	
	67.1	73.2	BEDROCK	soft and hard bedrock 2 1/2 GPM	
	73.2	79.2	BEDROCK	med. bedrock, more water 4 GPM	
	79.2	85.3	BEDROCK	soft bedrock, more water at 275'	
	85.3	91.4	BEDROCK	soft bedrock, more water at 293' 7 1/2 GPM	
	91.4	97.5	BEDROCK	med. bedrock 8 1/2 GPM	
	97.5	103.6	BEDROCK	soft bedrock - 330 - havel	
	103.6	109.7	BEDROCK	hard and med. bedrock	
23482	0.0	0.9	TILL	br. clay	
	0.9	1.2	TILL	loose rock	
	1.2	1.5	BEDROCK	rock	
	1.5	12.2	BEDROCK	rock with fracturing	
29076	0.0	0.6	TILL	black topsoil	
	0.6	3.7	TILL	clay	
	3.7	17.7	TILL	dens till with cobbles	
	17.7	28.7	TILL	silty clay	
	28.7	35.4	TILL	till with rocks	
	35.4	39.6	BEDROCK	crumbly bedrock	
	39.6	56.4	BEDROCK	bedrock, layers of very crumbly rocks	
	56.4	61.0	BEDROCK	bedrock	
29638	0.0	1.5	TILL	rocky soil	
	1.5	61.0	BEDROCK	bedrock	
31169	0.0	0.6	TILL	topsoil	
	0.6	5.2	TILL	till with rocks	
	5.2	48.8	BEDROCK	bedrock	
31543	0.0	0.0		Hole # 1	
	0.0	0.9	TILL	topsoil	
	0.9	3.4	TILL	till with boulders	
	3.4	21.3	BEDROCK	bedrock	making water from 14 m.

Table C-1. Selected WRBC Borehole Log Data Complied for Cross Section Interpretation

Water Well ID	Lithology				Notes
	Depth from (m)	Depth To (m)	Unit	Description	
32352	0.0	0.6	TILL	gravely topsoil	
	0.6	5.2	TILL	gravely clay and rocks	
	5.2	17.4	TILL	till with boulders	
	17.4	45.7	BEDROCK	hard bedrock	
	45.7	51.8	BEDROCK	faulty bedrock	
	0.0	61.0	BEDROCK	bedrock	
32381	0.0	0.3	TILL	gravely topsoil	
	0.3	4.3	TILL	coarse gravel with clay	
	4.3	8.2	TILL	till and boulders	
	8.2	51.8	BEDROCK	bedrock	
	0.0	0.0	BEDROCK	crumbly rock from 162'	
35289	0.0	0.3	TILL	topsoil	
	0.3	7.6	TILL	dense till	
	7.6	12.8	BEDROCK	crumbly bedrock, little sepage at 39'	
	12.8	18.9	BEDROCK	fairly hard rock	
	18.9	21.3	BEDROCK	bedrock	
35358	0.0	21.6	TILL	sand clay and hardpan	Yields 1 US GPM
	22.9	47.2	BEDROCK	bedrock	
35462	0.0	9.1	TILL	clay and rock	
	9.1	61.0	BEDROCK	bedrock	
35463	0.0	1.2	TILL	sandy clay	
	1.2	5.2	TILL	bedrock gravel	
	5.2	11.6	TILL	hardpan	
	11.6	14.3	BEDROCK	frac. bedrock	
	14.3	15.2	BEDROCK	bedrock	
35667	0.0	1.2	TILL	sandy clay	
	1.2	5.2	TILL	boulder gravel	
	5.2	11.6	TILL	hardpan	
	11.6	14.3	BEDROCK	fractured bedrock	
	14.3	15.2	BEDROCK	bedrock	
39755	0.0	5.2	TILL?	overburden	
	5.2	33.5	BEDROCK	bedrock	
	33.5	34.1	BEDROCK	fracture	
	34.1	41.1	BEDROCK	bedrock	
43320	0.0	4.3	TILL	clay and rocks	
	4.3	24.4	BEDROCK	fractured bedrock	
45576	0.0	2.4	TILL	black gumbo	
	2.4	7.9	TILL	clay till	
	7.9	12.2	BEDROCK	broken bedrock	
	12.2	120.7	BEDROCK	soft bedrock	
45762	0.0	6.7	TILL	clay and rocks	
	6.7	11.0	BEDROCK	bedrock	
	11.0	11.3	BEDROCK	fractured bedrock	
	11.3	19.8	BEDROCK	bedrock	

Table C-1. Selected WRBC Borehole Log Data Complied for Cross Section Interpretation

Water Well ID	Lithology				Notes
	Depth from (m)	Depth To (m)	Unit	Description	
51160	0.0	3.0	TILL	clay and rock	
	3.0	91.4	BEDROCK	bedrock	
51599	0.0	6.1	TILL	soil - sand - gravel	
	6.1	18.3	TILL	clay - gravel	
	18.3	21.3	SAND/GRAVEL	gravel (dry)	
	21.3	25.6	TILL	clay - gravel	
	25.6	36.6	BEDROCK	soft bedrock	
	36.6	42.7	BEDROCK	bedrock - water at 1/2 GPM	
	42.7	48.8	BEDROCK	hard bedrock	
	48.8	54.9	BEDROCK	medium bedrock	
	54.9	99.1	BEDROCK	soft bedrock	
51604	0.0	6.1	TILL	soil, sand, gravel	
	6.1	12.2	SAND/GRAVEL	gravel	
	12.2	18.3	TILL	clay, gravel (some water)	
	18.3	21.3	TILL	gravel, rock	
	21.3	27.4	BEDROCK	soft bedrock	
	27.4	28.3	BEDROCK	hard bedrock	
	28.3	30.5	BEDROCK	soft bedrock (some water)	
	30.5	48.8	BEDROCK	soft bedrock	
	48.8	54.9	BEDROCK	hard and soft bedrock (0.5 GPM)	
	54.9	61.0	BEDROCK	soft bedrock	
	61.0	67.1	BEDROCK	med. and soft bedrock (1.5 GPM)	
	67.1	85.3	BEDROCK	hard and soft bedrock	
51664	0.0	3.0	TILL	soil, gravel	
	3.0	6.1	SAND/GRAVEL	gravel, sand	
	6.1	9.1	TILL	rocks, gravel, clay	
	9.1	12.2	TILL	rocks, clay	
	12.2	18.3	TILL	clay	
	18.3	21.3	TILL	clay (damp)	
	21.3	24.1	TILL	clay, broken rocks	
	24.1	24.4	BEDROCK	soft bedrock	
	24.4	30.5	BEDROCK	soft and hard bedrock	
	30.5	61.0	BEDROCK	soft bedrock	
	61.0	67.1	BEDROCK	soft and hard bedrock	
	67.1	85.3	BEDROCK	soft bedrock	
	85.3	91.4	BEDROCK	soft and hard bedrock	
	91.4	97.5	BEDROCK	hard bedrock	
56944	0.0	3.7	BEDROCK	shattered rock	
	3.7	91.4	BEDROCK	bedrock	

Table C-1. Selected WRBC Borehole Log Data Complied for Cross Section Interpretation

Water Well ID	Lithology				Notes
	Depth from (m)	Depth To (m)	Unit	Description	
58455	0.0	1.5	TILL	topsoil	Casing was pulled and hold was filled.
	1.5	1.8	TILL	sandy clay	
	1.8	2.4	TILL	clay	
	2.4	7.9	SAND AND GRAVEL	sand and gravel	
	7.9	9.1	TILL	clay	
	9.1	11.6	TILL	gravel and clay	
	11.6	16.2	TILL	sand gravel and clay	
	16.2	16.2	BEDROCK	bedrock	
58502	0.0	24.1	TILL	clay w/rocks	
	24.1	61.0	BEDROCK	bedrock	
58711	0.0	2.1	BEDROCK	fractured rock	
	2.1	61.0	BEDROCK	bedrock	
61245	0.0	22.6	TILL	CLAY AND ROCKS	
	22.6	25.6	BEDROCK	BEDROCK	
	25.6	26.8	BEDROCK	BROKEN BEDROCK	
	26.8	30.5	BEDROCK	BEDROCK	
61347	0.0	4.3	TILL	CLAY AND ROCKS	
	4.3	5.5	BEDROCK	BROKEN BEDROCK	
	5.5	152.4	BEDROCK	LAYERED BEDROCK	
61348	0.0	3.0	TILL	CLAY AND ROCKS	
	3.0	4.3	BEDROCK	BROKEN BEDROCK	
	4.3	152.4	BEDROCK	LAYERED BEDROCK	
67887	0.0	1.5	TILL	CLAY &ROCK	
	1.5	3.0	TILL	BLACK PEAT	
	3.0	6.1	TILL	CLAY & ROCKS	
	6.1	10.7	TILL	SILT & GRAVEL	
	10.7	91.4	BEDROCK	BEDROCK	
67889	0.0	9.1	TILL	CLAY & ROCK	
	9.1	103.6	BEDROCK	BEDROCK	
76426	0.0	4.0	TILL	SAND & GRAVEL FILL	
	4.0	5.8	BEDROCK	SOFT WEATHERED BEDROCK	
	5.8	19.2	BEDROCK	SOFT GREEN & BLACK BEDROCK	
	19.2	48.8	BEDROCK	GREEN & GREY BEDROCK	
83861	0.0	1.2	TILL	DIRTY BROWN SAND & GRAVEL	
	1.2	3.4	TILL	BROWN CLAY TILL	
	3.4	4.9	BEDROCK	GY BEDROCK	
	4.9	26.5	BEDROCK	DK GREEN BEDROCK	
	26.5	61.9	BEDROCK	GY BEDROCK	
	61.9	65.2	BEDROCK	DK GREEN BEDROCK	

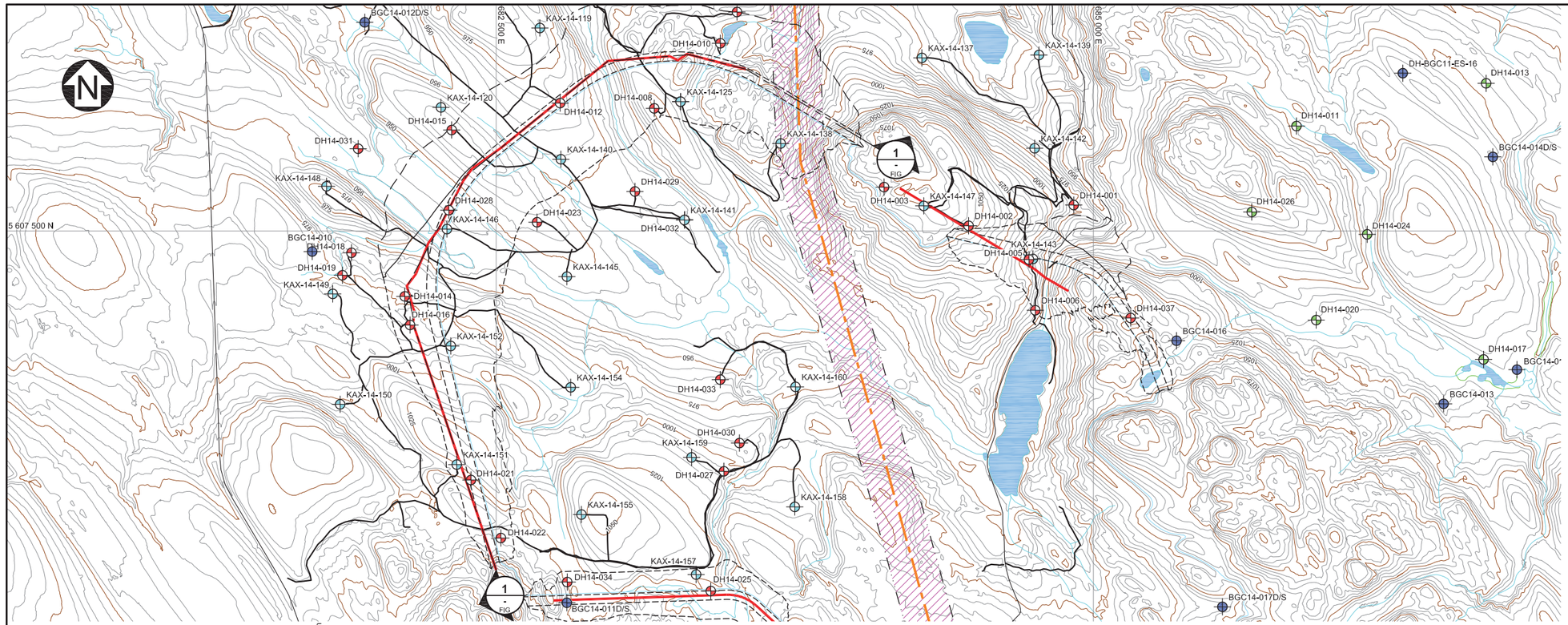
Table C-1. Selected WRBC Borehole Log Data Complied for Cross Section Interpretation

Water Well ID	Lithology				Notes
	Depth from (m)	Depth To (m)	Unit	Description	
83862	0.0	1.5	TILL	BR SILT & ROCKS	
	1.5	6.4	BEDROCK	DK GY BEDROCK	
	6.4	13.4	BEDROCK	BROWN-GREY BEDROCK	
	13.4	15.2	BEDROCK	DK GREEN	
	15.2	37.2	BEDROCK	BK	
	37.2	39.3	BEDROCK	SOFT & GREEN	
	39.3	44.2	BEDROCK	DK GY-HARDER	
	44.2	48.8	BEDROCK	LT GY & SOFT	
	48.8	68.3	BEDROCK	BK & HARD	
	68.3	78.6	BEDROCK	DARK GREEN & SOFTER	
	78.6	80.2	BEDROCK	LT GY	
83942	0.0	1.5	TILL	BR CLAY TILL	
	1.5	16.5	BEDROCK	DK GY BEDROCK	
	16.5	24.7	BEDROCK	BROWN & BLACK	
	24.7	35.4	BEDROCK	BROWN	
	35.4	43.9	BEDROCK	GREEN & BLACK	
	43.9	47.5	BEDROCK	BROWN	
	47.5	53.9	BEDROCK	GREEN	
	53.9	61.3	BEDROCK	BROWN	
	61.3	73.2	BEDROCK	GREEN	
	73.2	74.7	BEDROCK	BROWN	
90169	0.0	21.3	TILL	CLAY & GRAVEL	
	21.3	24.4	BEDROCK		
	24.4	61.0	BEDROCK		
94386	0.0	12.2	TILL	SILT SAND WITH COBBLE	
	12.2	15.2	TILL	SILT, CLAY & COBBLE	
	15.2	21.3	TILL		
	21.3	30.5	CLAY & ROCK	CLAY & ROCK	
	30.5	53.3	BEDROCK		
	53.3	60.4	BEDROCK		
	60.4	61.0	BEDROCK		
97388	0.0	3.7	TILL	CLAY & ROCKS	
	3.7	20.0	TILL		
	20.0	36.6	BEDROCK	rock	
	36.6	42.1	BEDROCK	rock	
	42.1	153.6	BEDROCK	rock	
104572	0.0	4.6	TILL	clay and rocks	
	4.6	6.7	TILL	gravel	
	6.7	17.4	TILL	clay and rocks	
	17.4	18.3	TILL	gravel	
	18.3	20.7	TILL	clay and rocks	
	20.7	25.9	TILL	gravel	
	25.9	153.0	TILL	rocks	

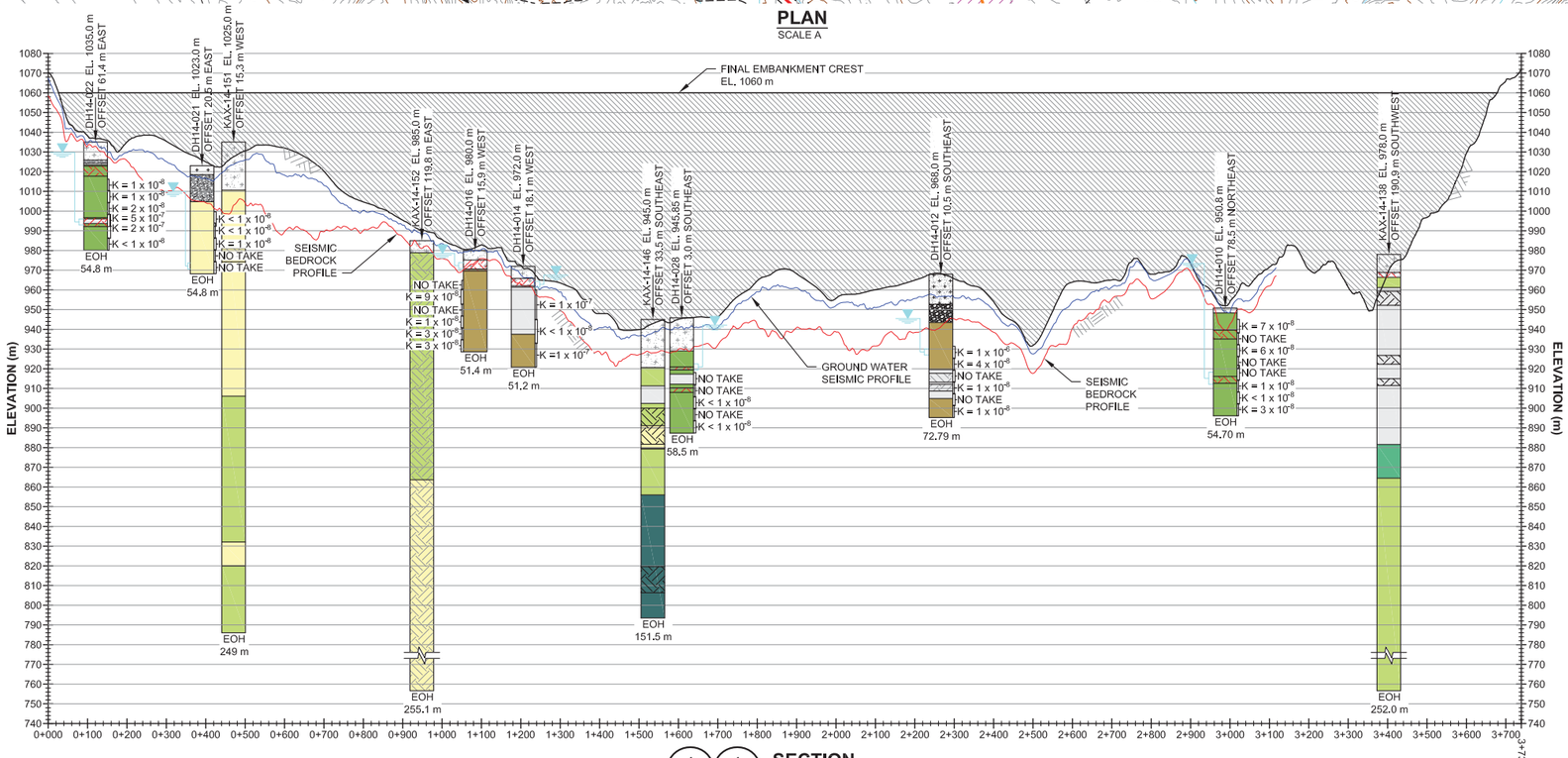
Table C-1. Selected WRBC Borehole Log Data Complied for Cross Section Interpretation

Water Well ID	Lithology				Notes
	Depth from (m)	Depth To (m)	Unit	Description	
108453	0.0	2.1	SAND AND GRAVEL	SAND AND GRAVEL	
	2.1	11.6	TILL	CLAY AND GRAVEL, TILL	
	11.6	14.5	TILL	SANDY, CLAY	
	14.5	22.3	TILL	CLAY AND GRAVEL	
	22.3	31.7	BEDROCK	DARK GREY BEDROCK	
	31.7	35.7	BEDROCK	LIGHT GREY AND WHITE BEDROCK	
	35.7	39.6	BEDROCK	DARK GREY AND WHITE BEDROCK	
	39.6	67.1	BEDROCK	LIGHT GREY AND WHITE BEDROCK	
82907	0.0	14.6	TILL	TILL & BOULDERS	
	14.6	61.0	BEDROCK	BEDROCK	
83801	0.0	47.3	TILL	GRAVEL CLAY	
	6.4	53.6	BEDROCK	BED ROCK	
83951	0.0	9.4	TILL	BR CLAY TILL	
	9.4	18.3	TILL	BR SAND CLAY	
	18.3	23.8	BEDROCK	GY SOFT BEDROCK	
	23.8	28.3	BEDROCK	BROWN BEDROCK	
	28.3	51.8	BEDROCK	GY & RED	
	51.8	82.9	BEDROCK	BROWN & SOFT	
	82.9	93.3	BEDROCK	GY & WHITE	
	93.3	112.8	BEDROCK	GY & BK	
	112.8	131.1	BEDROCK	RED & WHITE	
101551	0.0	7.0	TILL	GRAVEL TILL	
	7.0	35.1	TILL	GRAVELS	
	35.1	57.6	BEDROCK		
	57.6	77.4	BEDROCK	GREEN/GREY	
58648	0.0	9.8	TILL	overburden	
	9.8	80.5	BEDROCK	bedrock	

APPENDIX D
PRELIMINARY CROSS SECTIONS AND SEISMIC DATA INTERPRETATION FROM KNIGHT PIESOLD



PLAN
SCALE A



SECTION
HORIZONTAL: SCALE B
VERTICAL: SCALE C

LEGEND:

- SUGARLOAF DIORITE
- MAFIC VOLCANIC
- MAFIC TUFF
- PICRITE
- VOLCANICLASTIC
- SANDSTONE
- SILTSTONE
- MUDSTONE
- SEDIMENTARY
- PORPHYRY
- FRACTURED ZONE
- FAULT ZONE
- SHEAR ZONE
- MONITORING WELLS BY OTHERS
- CONDEMNATION DRILLHOLES
- ORIGINAL KP DRILLHOLES
- ADDITIONAL SCOPE DRILLHOLES
- SEISMIC LINE
- ACCESS ROAD
- $K = 3 \times 10^{-5}$ HYDRAULIC CONDUCTIVITY (m/sec)
- S.W.L. STATIC WATER LEVEL
- PIEZOMETERS

LEGEND:

- SILT
- CLAY AND SILT
- GRAVEL
- GRAVELY SAND
- SILTY SAND
- SANDY SILT
- SILTY GRAVEL
- SILTY SAND GRAVEL
- SAND AND GRAVEL
- GRAVELY SILT
- BOULDERS
- GLACIAL TILL

NOTES:

1. COORDINATE GRID IS UTM NAD83 ZONE 10.
2. CONTOUR INTERVAL IS 5 METRE, BASED ON 50 cm LIDAR DATA RECEIVED FROM AIRBORNE IMAGING JULY 2013.

SCALE C: 30 15 0 50 100 150 m
SCALE B: 150 75 0 250 500 750 m
SCALE A: 200 100 0 200 400 600 800 1000 m

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	REVIEWED
0	23MAR'15	ISSUED WITH REPORT	JAS	ABN	LJG

KGHM AJAX MINING INC.

AJAX PROJECT

SITE INVESTIGATION
NORTH EMBANKMENT
SECTION

Knight Piésold CONSULTING

P/A NO. VA101-246/26

REF NO. 11

FIGURE A1.6

REV 0

SAVED: M:\101\00246\26\A\Acad\FIGS\B73_r0_3/23/2015 3:50:19 PM, TMACGOWAN PRINTED: 3/23/2015 3:51:15 PM, Layout1, TMACGOWAN
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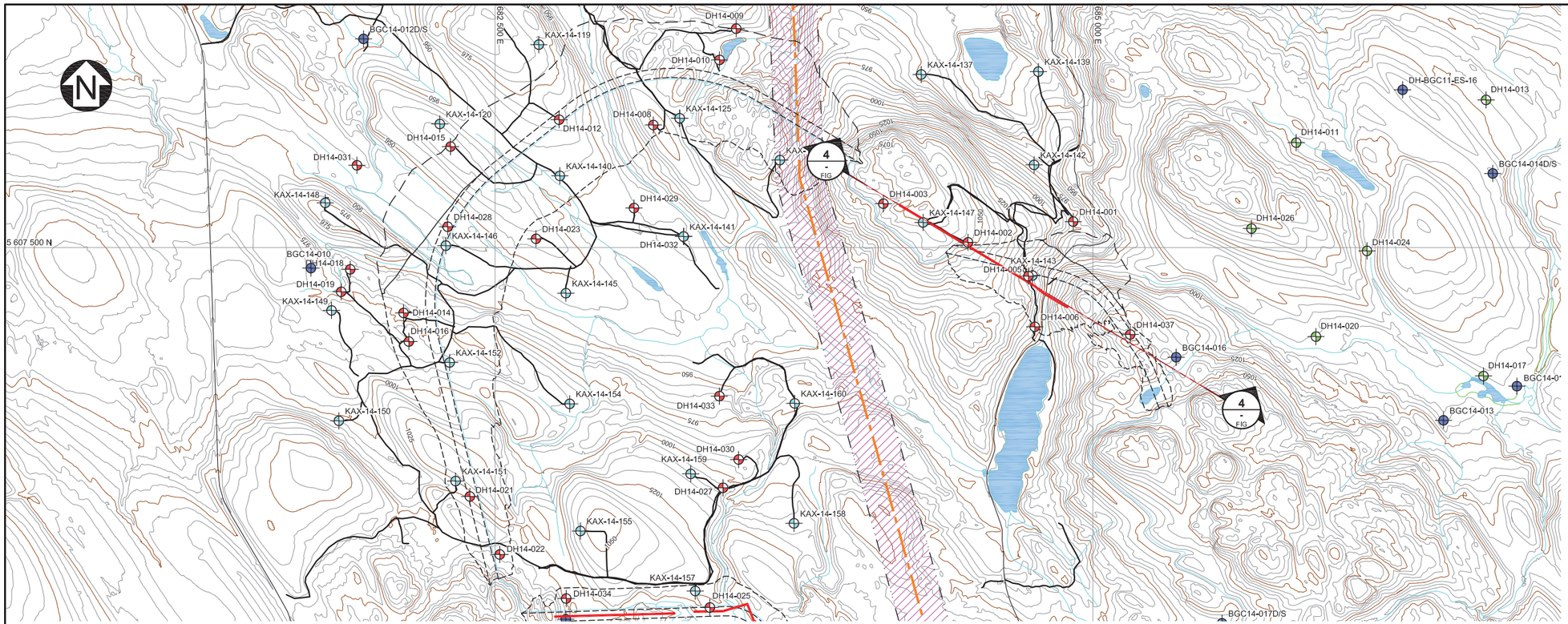
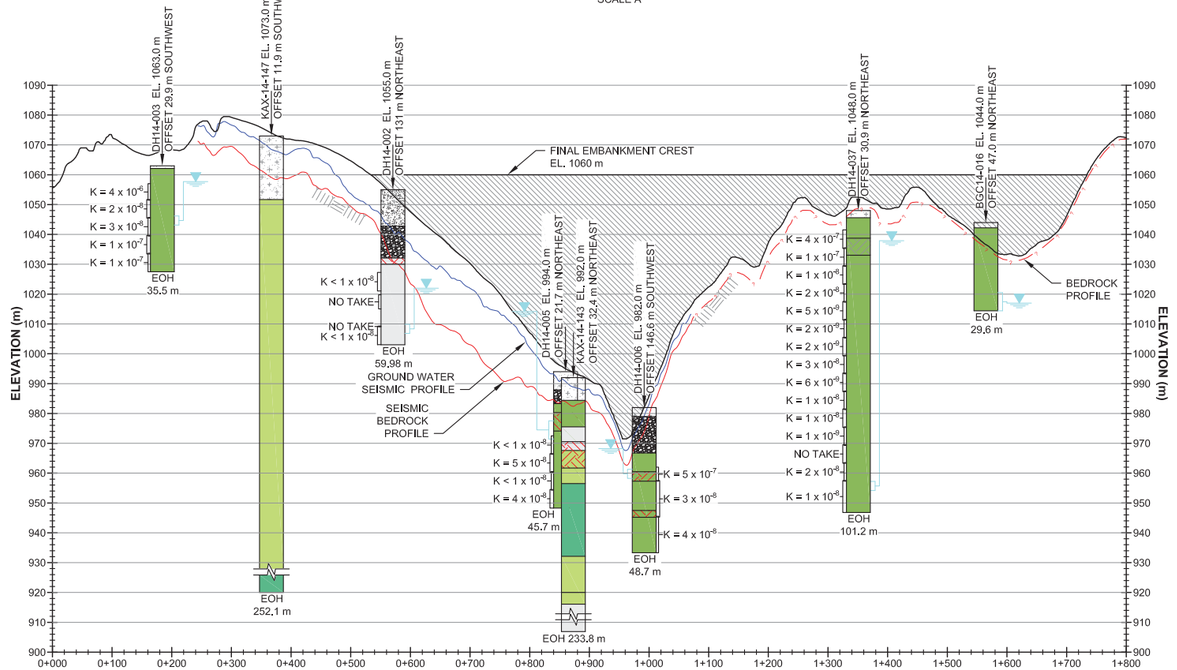


PLAN
SCALE A



SECTION
4 A1.2 FIG. / 4 - FIG.
HORIZONTAL: SCALE B
VERTICAL: SCALE C

LEGEND:

- SUGARLOAF DIORITE
- MAFIC VOLCANIC
- MAFIC TUFF
- PICRITE
- VOLCANICLASTIC
- SANDSTONE
- SILTSTONE
- MUDSTONE
- SEDIMENTARY
- PORPHYRY
- FRACTURED ZONE
- FAULT ZONE
- SHEAR ZONE
- MONITORING WELLS BY OTHERS
- CONDEMNATION DRILLHOLES
- ORIGINAL KP DRILLHOLES
- ADDITIONAL SCOPE DRILLHOLES
- SEISMIC LINE
- ACCESS ROAD
- $K = 3 \times 10^{-5}$ HYDRAULIC CONDUCTIVITY (m/sec)
- S.W.L. STATIC WATER LEVEL
- PIEZOMETERS

LEGEND:

- SILT
- CLAY AND SILT
- GRAVEL
- GRAVELY SAND
- SILTY SAND
- SANDY SILT
- SILTY GRAVEL
- SILTY SAND GRAVEL
- SAND AND GRAVEL
- GRAVELY SILT
- BOULDERS
- GLACIAL TILL

NOTES:

1. COORDINATE GRID IS UTM NAD83 ZONE 10.
2. CONTOUR INTERVAL IS 5 METRE, BASED ON 50 cm LIDAR DATA RECEIVED FROM AIRBORNE IMAGING JULY 2013.

SCALE C: 20 10 0 20 40 60 80 100 m
SCALE B: 100 50 0 100 200 300 400 500 m
SCALE A: 200 100 0 200 400 600 800 1000 m

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	REVIEWED
0	23MAR'15	ISSUED WITH REPORT	JAS	ABN	LJG

KGHM AJAX MINING INC.

AJAX PROJECT

SITE INVESTIGATION
EAST EMBANKMENT
SECTION

Knight Piésold CONSULTING

P/A NO. VA101-246/26 | REF NO. 11

FIGURE A1.7 | REV 0

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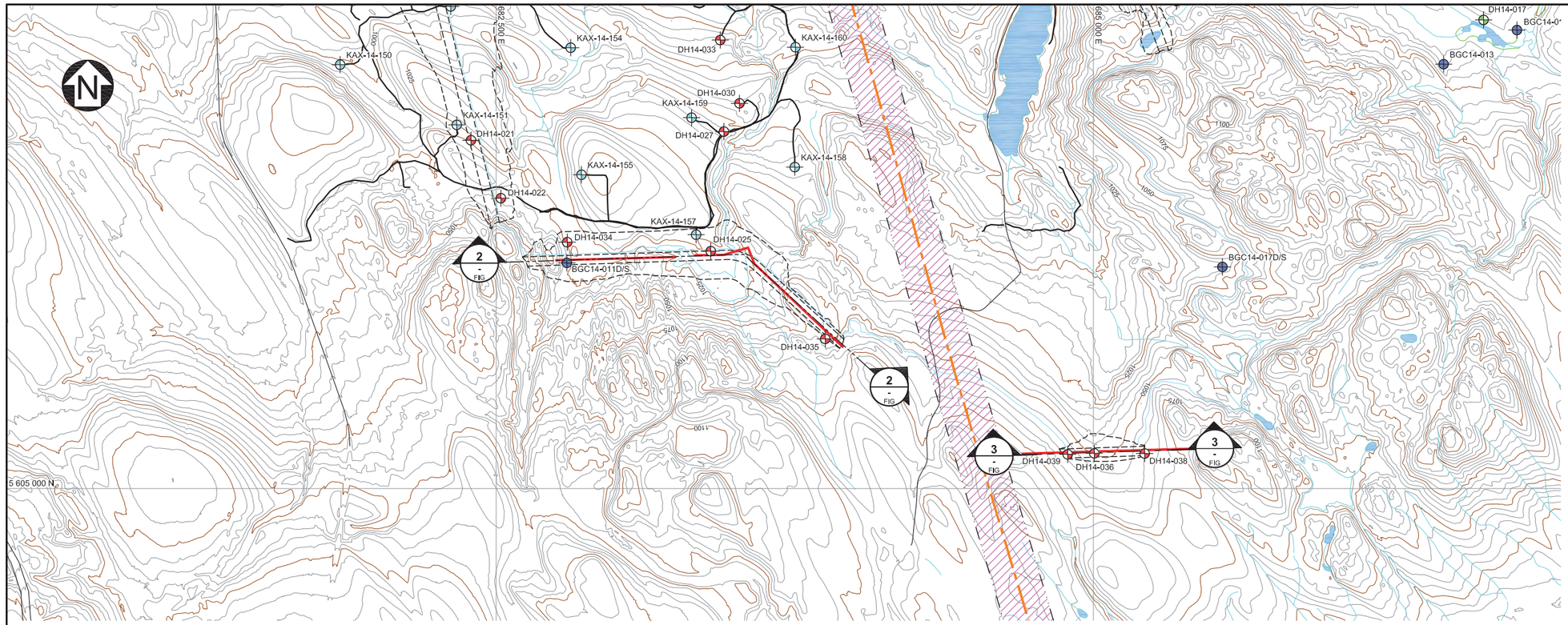
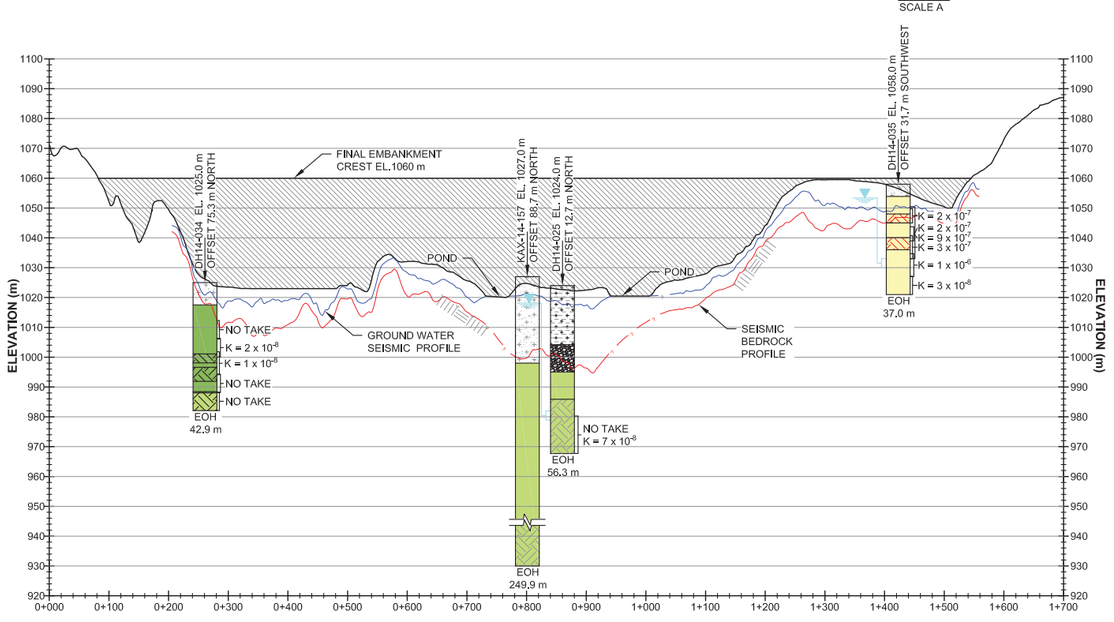
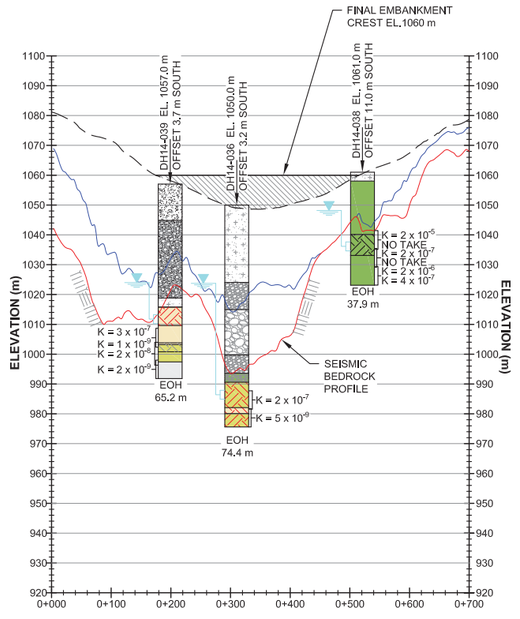


PLAN
SCALE A



2 / A1.2 FIG - 2 / - FIG **SECTION**
HORIZONTAL: SCALE B
VERTICAL: SCALE C



3 / A1.2 FIG - 3 / - FIG **SECTION**
HORIZONTAL: SCALE B
VERTICAL: SCALE C

LEGEND:

- SUGARLOAF DIORITE
- MAFIC VOLCANIC
- MAFIC TUFF
- PICRITE
- VOLCANICLASTIC
- SANDSTONE
- SILTSTONE
- MUDSTONE
- SEDIMENTARY
- PORPHYRY
- FRACTURED ZONE
- FAULT ZONE
- SHEAR ZONE
- MONITORING WELLS BY OTHERS
- CONDEMNATION DRILLHOLES
- ORIGINAL KP DRILLHOLES
- ADDITIONAL SCOPE DRILLHOLES
- SEISMIC LINE
- ACCESS ROAD
- K = 3 x 10-5 HYDRAULIC CONDUCTIVITY (m/sec)
- S.W.L. STATIC WATER LEVEL PIEZOMETERS

LEGEND:

- SILT
- CLAY AND SILT
- GRAVEL
- GRAVELY SAND
- SILTY SAND
- SANDY SILT
- SILTY GRAVEL
- SILTY SAND GRAVEL
- SAND AND GRAVEL
- GRAVELY SILT
- BOULDERS
- GLACIAL TILL

NOTES:

1. COORDINATE GRID IS UTM NAD83 ZONE 10.
2. CONTOUR INTERVAL IS 5 METRE, BASED ON 50 cm LIDAR DATA RECEIVED FROM AIRBORNE IMAGING JULY 2013.

SCALE C: 20 10 0 20 40 60 80 100 m
SCALE B: 100 50 0 100 200 300 400 500 m
SCALE A: 200 100 0 200 400 600 800 1000 m

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	REVIEWED
0	23MAR'15	ISSUED WITH REPORT	JAS	ABN	LJG

KGHM AJAX MINING INC.

AJAX PROJECT

SITE INVESTIGATION
SOUTH AND SOUTHEAST EMBANKMENTS
SECTIONS

Knight Piésold CONSULTING

P/A NO. VA101-246/26 | REF NO. 11

FIGURE A1.8 | REV 0

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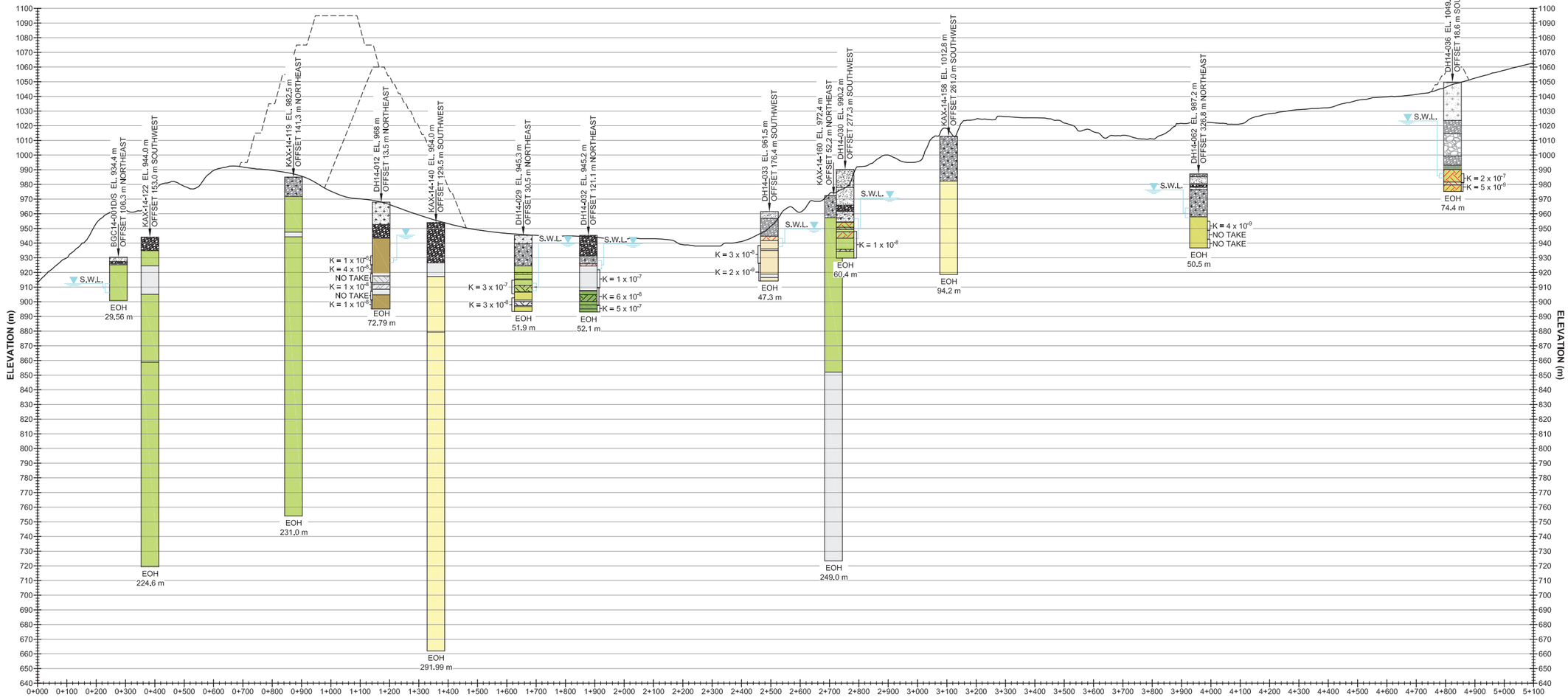

1 / A1.2 FIG. **SECTION**
HORIZONTAL: SCALE A
VERTICAL: SCALE B

LEGEND:

- SUGARLOAF DIORITE
- MAFIC VOLCANIC
- MAFIC TUFF
- PICRITE
- VOLCANICLASTIC
- SANDSTONE
- SILTSTONE
- MUDSTONE
- SEDIMENTARY
- PORPHYRY
- FRACTURED ZONE
- FAULT ZONE
- SHEAR ZONE

LEGEND:

- SILT
- CLAY AND SILT
- GRAVEL
- GRAVELLY SAND
- SILTY SAND
- SANDY SILT
- SILTY GRAVEL
- SILTY SAND GRAVEL
- SAND AND GRAVEL
- GRAVELLY SILT
- BOULDERS
- GLACIAL TILL
- SAND

LEGEND:

- $K = 3 \times 10^{-5}$ HYDRAULIC CONDUCTIVITY (m/sec)
- S.W.L. STATIC WATER LEVEL PIEZOMETERS

NOTES:

1. DIMENSIONS ARE IN MILLIMETRES AND ELEVATIONS ARE IN METRES, UNLESS NOTED OTHERWISE.

SCALE B: 30 15 0 50 100 150 m
SCALE A: 150 75 0 250 500 750 m

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	REVIEWED
0	23MAR'15	ISSUED WITH REPORT	JAS	ABN	LJG

KGHM AJAX MINING INC.

AJAX PROJECT

SITE INVESTIGATION
TSF BASIN
LONG SECTION

Knight Piésold CONSULTING

P/A NO. VA101-246/26 | REF NO. 11

FIGURE A1.9 | REV 0

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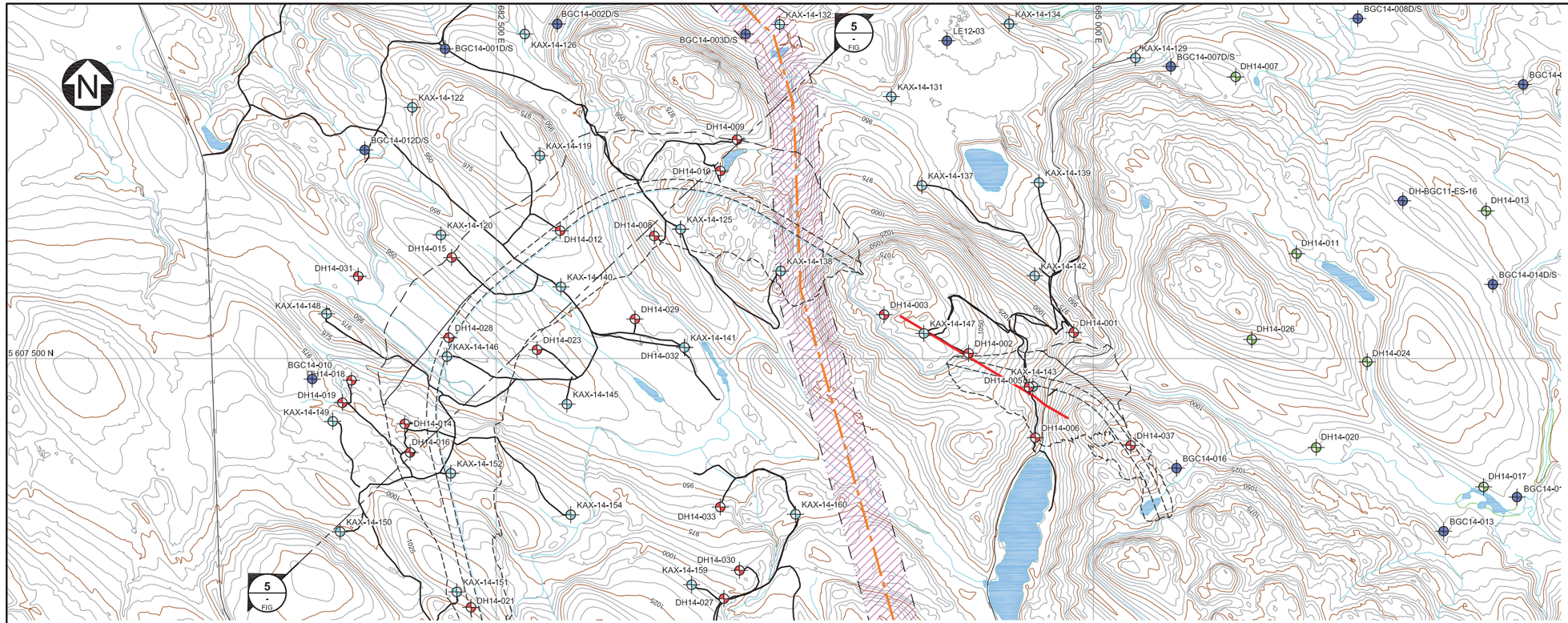
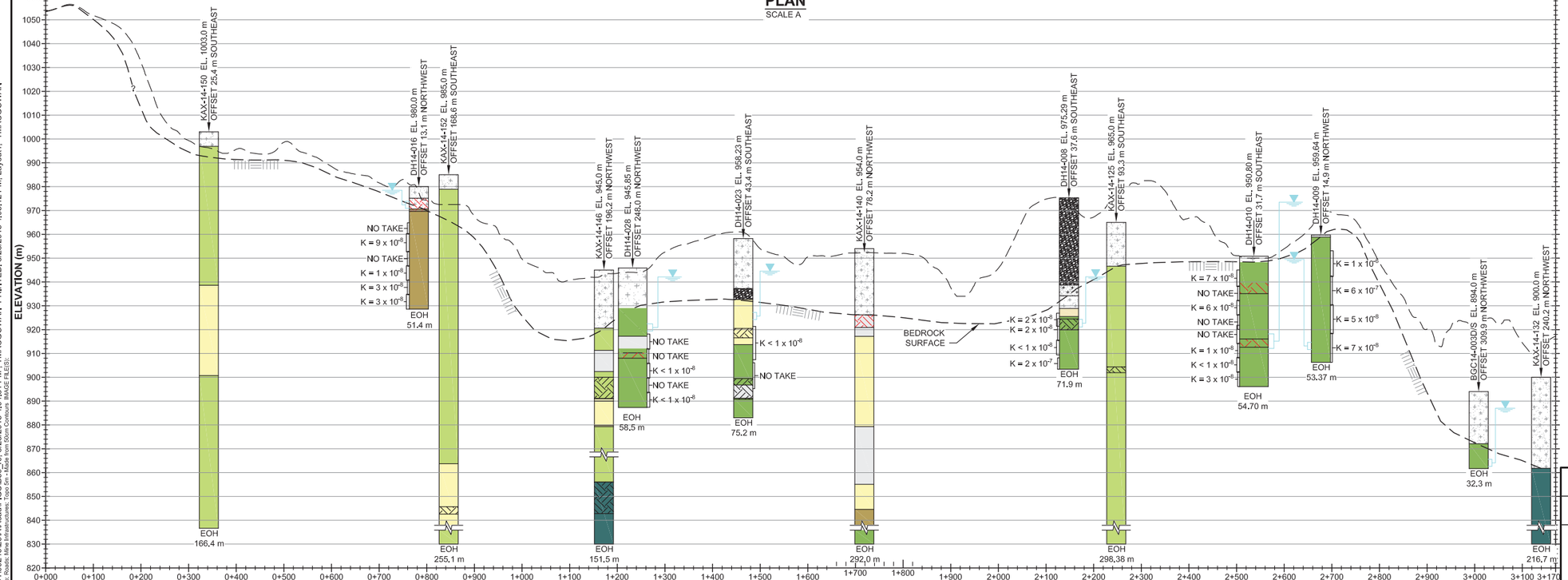
PLAN
SCALE A



SECTION
HORIZONTAL: SCALE B
VERTICAL: SCALE C

5 A1.2 FIG — 5 - FIG



LEGEND:

- SUGARLOAF DIORITE
- MAFIC VOLCANIC
- MAFIC TUFF
- PICRITE
- VOLCANICLASTIC
- SANDSTONE
- SILTSTONE
- MUDSTONE
- SEDIMENTARY
- PORPHYRY
- FRACTURED ZONE
- FAULT ZONE
- SHEAR ZONE
- MONITORING WELLS BY OTHERS
- CONDEMNATION DRILLHOLES
- ORIGINAL KP DRILLHOLES
- ADDITIONAL SCOPE DRILLHOLES
- SEISMIC LINE
- ACCESS ROAD
- K = 3 x 10-5 HYDRAULIC CONDUCTIVITY (m/sec)
- S.W.L. STATIC WATER LEVEL
- PIEZOMETERS

LEGEND:

- SILT
- CLAY AND SILT
- GRAVEL
- GRAVELY SAND
- SILTY SAND
- SANDY SILT
- SILTY GRAVEL
- SILTY SAND GRAVEL
- SAND AND GRAVEL
- GRAVELY SILT
- BOULDERS
- GLACIAL TILL

NOTES:

1. COORDINATE GRID IS UTM NAD83 ZONE 10.
2. CONTOUR INTERVAL IS 5 METRE, BASED ON 50 cm LIDAR DATA RECEIVED FROM AIRBORNE IMAGING JULY 2013.

SCALE C: 20 10 0 20 40 60 80 100 m
SCALE B: 100 50 0 100 200 300 400 500 m
SCALE A: 200 100 0 200 400 600 800 1000 m

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	REVIEWED
0	23MAR'15	ISSUED WITH REPORT	JAS	ABN	LJG

KGHM AJAX MINING INC.

AJAX PROJECT

SITE INVESTIGATION
TSF BASIN
SECTION

Knight Piésold CONSULTING

P/A NO.	REF NO.
VA101-246/26	11

FIGURE A1.10 REV 0

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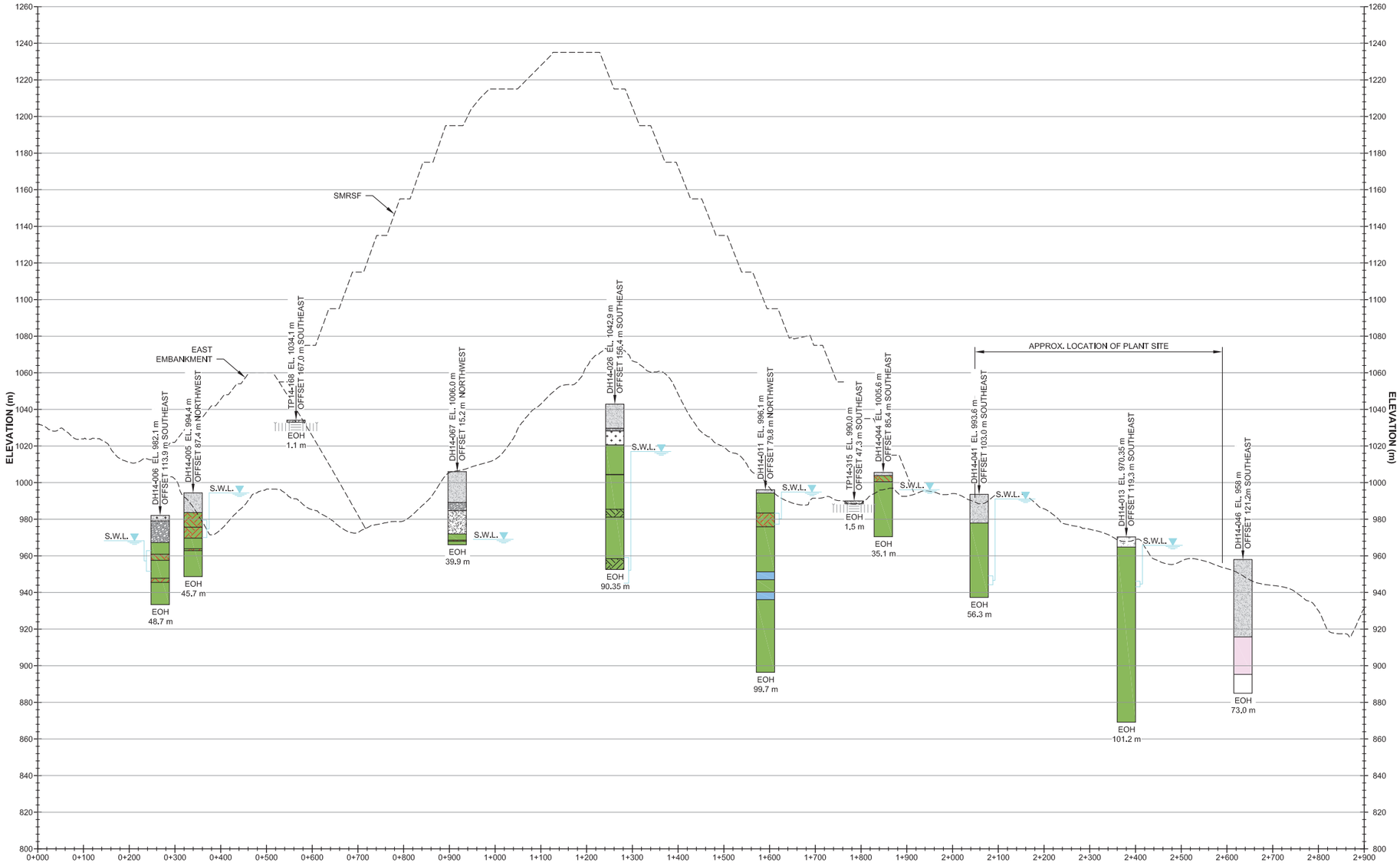

1 / A1.3 FIG

SECTION
SUB-TITLE
HORIZONTAL: SCALE A
VERTICAL: SCALE B

LEGEND:

- SUGARLOAF DIORITE
- MAFIC VOLCANIC
- MAFIC TUFF
- PICRITE
- VOLCANICLASTIC
- SANDSTONE
- SILTSTONE
- MUDSTONE

LEGEND:

- SEDIMENTARY
- PORPHYRY
- IRON MASK HYBRID
- MONZONITE
- FRACTURED ZONE
- FAULT ZONE
- SHEAR ZONE

LEGEND:

- SILT
- CLAY AND SILT
- GRAVEL
- GRAVELY SAND
- SILTY SAND
- SANDY SILT
- SILTY GRAVEL
- SILTY SAND GRAVEL

LEGEND:

- SAND AND GRAVEL
- GRAVELY SILT
- BOULDERS
- GLACIAL TILL
- SAND
- GLACIAL TILL

LEGEND:

- $K = 3 \times 10^{-5}$ HYDRAULIC CONDUCTIVITY (m/sec)
- S.W.L. STATIC WATER LEVEL PIEZOMETERS

SCALE B: 25 12.5 0 25 50 75 100 125 m
SCALE A: 100 50 0 100 200 300 400 500 m

NOTES:

1. DIMENSIONS ARE IN MILLIMETRES AND ELEVATIONS ARE IN METRES, UNLESS NOTED OTHERWISE.

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	REVIEWED
0	23MAR'15	ISSUED WITH REPORT	JAS	ABN	LJG

KGHM AJAX MINING INC.

AJAX PROJECT

SMRSF
GEOTECHNICAL SITE INVESTIGATION
SECTION

Knight Piésold CONSULTING

P/A NO. VA101-246/26 | REF NO. 11

FIGURE A1.11 | REV 0

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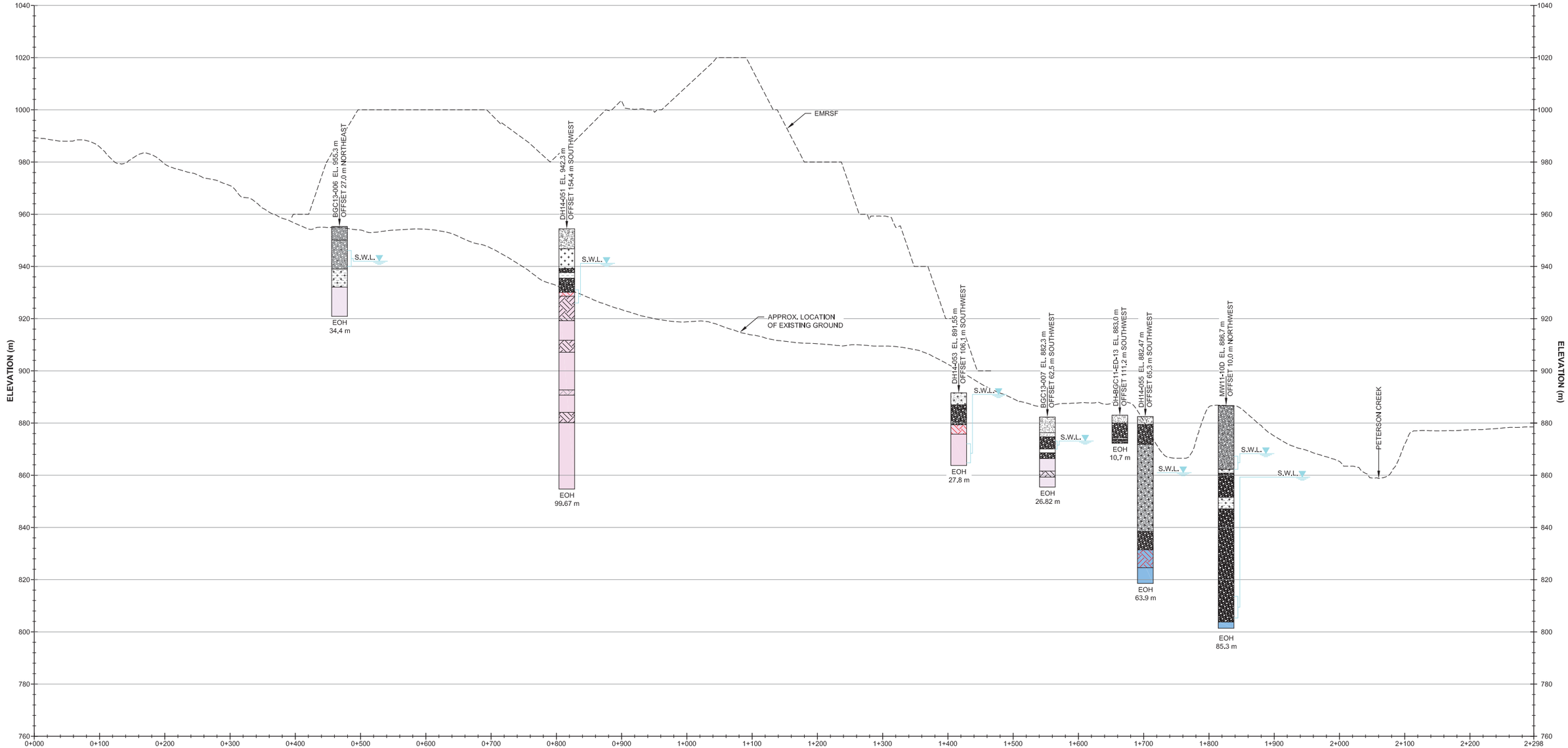

1 / A1,3 FIG **SECTION**

SUB-TITLE

HORIZONTAL: SCALE A
VERTICAL: SCALE B

NOTES:

1. DIMENSIONS ARE IN MILLIMETRES AND ELEVATIONS ARE IN METRES, UNLESS NOTED OTHERWISE.

SCALE B: 15 7.5 0 25 50 75 m

SCALE A: 60 30 0 100 200 300 m

LEGEND:

- SUGARLOAF DIORITE
- MAFIC VOLCANIC
- MAFIC TUFF
- PICRITE
- VOLCANICLASTIC
- SANDSTONE
- SILTSTONE
- MUDSTONE

LEGEND:

- SEDIMENTARY
- PORPHYRY
- IRON MASK HYBRID
- MONZONITE
- FRACTURED ZONE
- FAULT ZONE
- SHEAR ZONE

LEGEND:

- SILT
- CLAY AND SILT
- GRAVEL
- GRAVELY SAND
- SILTY SAND
- SANDY SILT
- SILTY GRAVEL

LEGEND:

- SILTY SAND GRAVEL
- SAND AND GRAVEL
- GRAVELY SILT
- BOULDERS
- GLACIAL TILL
- SAND
- S.W.L. STATIC WATER LEVEL PIEZOMETERS

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	REVIEWED
0	23MAR'15	ISSUED WITH REPORT	JAS	ABN	LJG

KGHM AJAX MINING INC.

AJAX PROJECT

EMRSF
GEOTECHNICAL SITE INVESTIGATION
SECTION

Knight Piésold CONSULTING

P/A NO. VA101-246/26

REF NO. 11

FIGURE A1.12

REV 0

SAVED: M:\101\00246\26\A\Acad\FIGS\B106_r0. 3/23/2015 4:15:06 PM. TMACGOWAN PRINTED: 3/23/2015 4:15:53 PM. Layout1. TMACGOWAN
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APPENDIX E
WRBC REGISTERED WELL SEARCH RESULTS WITHIN THE RSA

Table E-1. WRBC Registered Well Search Results within the RSA

WRBC ENTRIES																BGC INTERPRETATIONS		
WELL ID	WELL TAG NUMBER	AQUIFER LITHOLOGY CODE[1]	ARTESIAN FLOW VALUE	BEDROCK DEPTH (FT)	DEPTH WELL DRILLED (FT)	DIAMETER (IN)	GENERAL REMARKS	GROUNDWATER FLAG	SURFACE SEAL DEPTH (FT)	UTM NORTH (M)	UTM EAST (M)	WATER DEPTH (FT)	YIELD	YIELD UNITS	WELL USE	Interpreted Aquifer[2]	Notes	In LSA ?
62847	61347	BED		14	500	6				5608131	690087	20	0.2	GPM	Private Domestic	276		N
42379	28	BED		40	360	6.5				5618802	667170	45	20	GPM	Private Domestic	727		N
56880	71	BED			101	7				5613474	703483	60	0		Unknown Well Use	285		N
54172	1096	BED			12		WELL IS DUG BY PETERSON CREEK.			5607518	681208		0		Private Domestic	No Mapped Aquifer		Y
109	58934	BED			50	6.5				5609644	688973	25	0.5	GPM	Private Domestic	278		Y
42286	1498	BED			60	8				5606583	687281		0		Private Domestic	No Mapped Aquifer		Y
42287	1506	BED			4		WENT DRY IN 1930			5607509	688083		0		Private Domestic	No Mapped UNC Aquifer		Y
42440	49022	BED			45	6				5610405	689077	18	2	GPM	Private Domestic	277		Y
107668	106786	UNC			396		HOLE 2. METHOD OF DRILLING AIR ROTARY AND DUAL ROTARY. LINER THICKNESS 160 IN.	N		5609110	688697	48	0.5	USGM	Private Domestic	278	log completion lithology not specified in well database, assumed to be unconsolidated since depth of bedrock is unkown	N
42430	4240	BED			18					5618579	683072	13	0		Private Domestic	284		N
42458	4248	BED			400	6	OLD OBS WELL # WR-50-64. ABANDONED TEST HOLE . AB. 76 - SUBDIVISION BUILT OVER WELL.	N		5612794	687456	9	0		Unknown Well Use	No Mapped UNC Aquifer		Y
42444	4253	BED			10					5611578	688619	5	0		Private Domestic	No Mapped UNC Aquifer		Y
42581	4274	BED			163	8				5614546	701695	27	0		Unknown Well Use	285		N
42432	4321	BED			104	5	WATER GREEN AND ODOROUS FROM VEGETATION			5618324	682957	10	12	IGM	Unknown Well Use	284		N
42547	4333	BED			23					5614130	700037	18	0		Private Domestic	280		N
42284	4351	BED								5602488	694097		0		Private Domestic	No Mapped UNC Aquifer		N
42429	4352	BED								5618745	682019		0		Private Domestic	284		N
42441	49048	BED			40	6				5610435	689078	20	5	GPM	Private Domestic	277		Y
42439	4389	BED		212	225	6	BAIL TEST 175' AT 10 GPM. SET PUMP AT 210 FT. 10 GPM 1 HR.			5610054	690511	58	10	GPM	Unknown Well Use	273		N
42404	4400	BED								5615041	672991		0		Private Domestic	No Mapped UNC Aquifer		N
42427	4415	BED			15					5618844	682202		0		Private Domestic	284		N
42424	4438	BED			300		OLD OBS WELL # WR-59-64 AB. 72.	N		5614277	676958	11	0		Unknown Well Use	No Mapped UNC Aquifer		Y
42288	13490	BED			14					5606369	690921	10	0		Private Domestic	No Mapped UNC Aquifer		N
42433	13870	BED			157	5				5618575	682990		0		Unknown Well Use	284		N
42434	13871	BED			115	5				5618405	682985	12	0		Unknown Well Use	284		N
42431	13872	BED			115	5				5618962	683053		0		Unknown Well Use	284		N

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WRBC ENTRIES																BGC INTERPRETATIONS		
WELL ID	WELL TAG NUMBER	AQUIFER LITHOLOGY CODE[1]	ARTESIAN FLOW VALUE	BEDROCK DEPTH (FT)	DEPTH WELL DRILLED (FT)	DIAMETER (IN)	GENERAL REMARKS	GROUNDWATER FLAG	SURFACE SEAL DEPTH (FT)	UTM NORTH (M)	UTM EAST (M)	WATER DEPTH (FT)	YIELD	YIELD UNITS	WELL USE	Interpreted Aquifer[2]	Notes	In LSA ?
42425	14806	BED		135	436	6	DRY HOLE			5615553	683407		0		Unknown Well Use	No Mapped Aquifer		N
45609	14817	BED		101	102					5615191	682549		0		Unknown Well Use	No Mapped Aquifer		N
42483	14873	BED			50	6	YIELD 8-10 GPM. PUMPING LEVEL 35' AT 10 GPM. BAILED - PUMP WAS PUT IN BUT THE WELL WOULD NOT PRODUCE ADEQUATELY.			5617765	683701	30	8	GPM	Unknown Well Use	No Mapped Aquifer		N
110	59081	BED			58	6.5				5610414	689092	35	8	GPM	Private Domestic	277		Y
42697	17998	BED			200	10	DRY HOLE			5619415	669444		0		Unknown Well Use	728		N
42403	17999	BED		240	325					5614130	671361	9	2	GPM	Unknown Well Use	No Mapped Aquifer		N
42699	18204	BED	0.01	89	89	6	YIELD - 6 GPM AT 89" ARTESIAN.	N		5619548	669439		6	GPM	Unknown Well Use	728		N
42698	18233	BED		118	120	10				5619266	669445	11	275	GPM	Unknown Well Use	728		N
61082	60441	BED			48					5609709	689029		10	GPM	Private Domestic	278		Y
42426	18637	BED			105		DRY HOLE			5615542	682906		0		Unknown Well Use	No Mapped Aquifer		N
42428	18768	BED			50	6				5618620	682385	10	50	GPM	Unknown Well Use	284		N
42485	19142	UNC			290	8				5617564	688324		0		Unknown Well Use	286		N
42540	21031	BED			211	6	YIELD 8 GPM WITH A PUMPING LEVEL OF 190 FT			5614694	699643	55	8	GPM	Unknown Well Use	280		N
42611	21049	BED			158					5615155	699348	88	8	GPM	Unknown Well Use	280		N
42614	21830	BED		161	167	6				5615400	699037	110	5	USGM	Unknown Well Use	273		N
42447	22352	BED			50					5611202	689655		0		Unknown Well Use	No Mapped UNC Aquifer		N
42459	23062	BED			169					5613292	687392		0		Unknown Well Use	No Mapped UNC Aquifer		N
42446	23482	BED		4	40	12	TESTED AT 10 GPM. PUMPED 10 - 15 GPM. RECOMMEND PUMP SET AT 30' - 35'			5611329	689878	5	10	GPM	Unknown Well Use	273		N
42612	23665	BED			255	6				5615285	699106		10	GPH	Unknown Well Use	280		N
42618	23668	BED			102	6				5614895	701833	43	2	GPM	Unknown Well Use	285		N
42615	23765	BED		33	349	6	NOT IN USE YET, GOOD WATER, PLAN TO DRILL 100' DEEPER NEXT YEAR (1972)			5614818	701277	269	1	GPM	Unknown Well Use	273		N
42559	24291	BED			247	6				5614741	701324	182	10	GPM	Private Domestic	No mapped UNC aquifer		N

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WRBC ENTRIES																BGC INTERPRETATIONS		
WELL ID	WELL TAG NUMBER	AQUIFER LITHOLOGY CODE[1]	ARTESIAN FLOW VALUE	BEDROCK DEPTH (FT)	DEPTH WELL DRILLED (FT)	DIAMETER (IN)	GENERAL REMARKS	GROUNDWATER FLAG	SURFACE SEAL DEPTH (FT)	UTM NORTH (M)	UTM EAST (M)	WATER DEPTH (FT)	YIELD	YIELD UNITS	WELL USE	Interpreted Aquifer[2]	Notes	In LSA ?
42521	24466	UNC			113	6	THIS WAS A TEST HOLE FOR A CITY WATER SUPPLY BECAUSE THERE WERE PHENALS IN THE RIVER FROM AN UNIDENTIFIED SOURCE & AN ALTERNATE SOURCE OF WATER WAS BEING SOUGH			5617076	691130	18	0		Unknown Well Use	286		N
42551	24714	BED		4	375	6				5614268	700782		0		Unknown Well Use	273		N
42560	24715	BED		4	395	6	YIELD: VERY SMALL AMOUNT			5614412	700749		0		Unknown Well Use	273		N
42578	25092	BED			101		DRY HOLE			5614237	701928		0		Unknown Well Use	285		N
42579	25093	BED			41	6				5614184	701814		10	GPM	Unknown Well Use	285		N
42544	25283	BED		87	170					5613381	700539	97	20	GPM	Unknown Well Use	273		N
42530	25299	BED	0.01		124	6	ARTESIAN	N		5611640	700432		5	GPM	Unknown Well Use	280		N
42537	25300	BED			124	6				5612239	700127		5	GPM	Unknown Well Use	280		N
42583	25864	BED			213					5614753	701501	120	1	GPM	Unknown Well Use	285		N
42582	25865	BED			163	8				5614464	701781	27	100	USGM	Unknown Well Use	285		N
42580	25866	BED			213					5614692	701614	188	1	GPM	Unknown Well Use	285		N
42408	25868	BED			100					5617363	671081		0		Unknown Well Use	728		N
42563	25869	BED			120	6	YIELD: 15 GPM BY BAIL 1 HOUR. NO DRAWDOWN			5613038	702777	93	15	GPM	Unknown Well Use	285		N
42561	26627	BED		14	150	6				5614246	700920	10	0.3	GPM	Unknown Well Use	273		N
42610	27375	BED		229	250	6	BAIL AT 4 GPM AT 250 FT FOR 1 HOUR. SET PUMP AT 245'. THERE ARE FINE LAYERS OF GRAVEL (W.B.) FROM 60 FT. PUMPED AT 18 GPM, NO DRAWDOWN.			5615780	699429	55	18	GPM	Unknown Well Use	273		N
42477	27653	BED			187	6	RECOMMENDED PUMP SETTING 150', OUTPUT 20 GPM.			5610177	690752	60	20	GPM	Private Domestic	No mapped UNC aquifer		N
42479	27738	BED			119	6	RECOMMENDED PUMP SETTING 100', 35 GPM.			5610179	690917		27	GPM	Unknown Well Use	No mapped UNC aquifer		N
54173	29076	BED		116	200	5				5607444	681238	8	4	GPM	Private Domestic	No Mapped Aquifer		Y
42398	29197	BED		67	90	6				5611384	678068	25	30	GPM	Unknown Well Use	No Mapped Aquifer		Y
42400	29234	BED			200	6				5611812	677111		0		Unknown Well Use	No Mapped Aquifer		Y
54208	29259	BED		229	250	6				5610634	690713	70	4	GPM	Private Domestic	273		N
42613	29635	BED		347	430					5615588	699386	54	0.5	GPM	Unknown Well Use	No Mapped UNC Aquifer		N
42456	29638	BED		5	200	6	REC. PUMP SETTING 95'. REC. MAX. PUMP OUTPUT 3 GPM.			5611370	689941	33	3	GPM	Unknown Well Use	273		N

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WRBC ENTRIES																BGC INTERPRETATIONS		
WELL ID	WELL TAG NUMBER	AQUIFER LITHOLOGY CODE[1]	ARTESIAN FLOW VALUE	BEDROCK DEPTH (FT)	DEPTH WELL DRILLED (FT)	DIAMETER (IN)	GENERAL REMARKS	GROUNDWATER FLAG	SURFACE SEAL DEPTH (FT)	UTM NORTH (M)	UTM EAST (M)	WATER DEPTH (FT)	YIELD	YIELD UNITS	WELL USE	Interpreted Aquifer[2]	Notes	In LSA ?
42435	30214	BED			33	4				5619007	682966		0		Unknown Well Use	284		N
42298	30304	BED		22	300	6				5605184	694950	8	0.5	GPM	Unknown Well Use	273		N
42368	30692	BED		4	280	5.5				5617351	669294	10	0		Unknown Well Use	727		N
104	56944	BED		12	300	6.5	ABANDONED			5610319	682060		0.5	GPM	Abandoned	276		Y
42405	31517	BED		14	70	4				5616055	671893	59	0		Unknown Well Use	727		N
42470	31543	BED		11	70	6	REC. PUMP SETTING 65'. REC. MAX. PUMP OUTPUT 30 GPH.			5610214	691297	14	30	GPH	Unknown Well Use	273		N
42478	31561	BED		14	85	6	RECOMMENDED MAX. PUMP OUTPUT 15 GPH.			5610300	690910	14	15	GPH	Unknown Well Use	273		N
42473	31621	BED		43	130	6				5610238	690909	32	0.5	GPM	Unknown Well Use	273		N
42460	31901	BED		11	140	6				5610374	690927	11	2	GPM	Unknown Well Use	273		N
42471	31907	BED		10	115	6				5610369	690911	31	0		Unknown Well Use	273		N
98270	97388	BED		65.5	477		PVC 160PSI	N	18	5606883	689686	60	0.8	USGM	Private Domestic	276		N
42295	32381	BED		27	170	6				5608480	689768	13	20	GPM	Unknown Well Use	273		N
42472	32710	BED		105	380	6				5610507	690816	216	0.5	GPM	Unknown Well Use	273		N
45608	32831	BED		50	124		THREE WELLS WERE DONE ON THIS PROPERTY. NONE ARE IN USE. HAVE WATER RIGHTS TO CREEK FOR SOURCE OF WATER.			5617220	670127	100	4	GPM	Unknown Well Use	727		N
42531	32852	BED			205	6	A TIGHT FORMATION, A LOT OF CLAY.			5611783	700608	98	10	GPM	Unknown Well Use	No mapped UNC aquifer		N
42385	32853	BED		16	375	6.5				5617955	668852	30	30	GPH	Unknown Well Use	727		N
42462	33452	BED		27	150					5610213	691366	24	15	GPH	Unknown Well Use	No Mapped UNC Aquifer		N
42301	33471	BED		60	70	6				5608377	694503	60	0.5	GPM	Unknown Well Use	273		N
42463	34165	BED			40					5610939	691434	9	2	GPM	Unknown Well Use	No Mapped UNC Aquifer		N
42543	34767	BED			73	6				5613436	699513	60	10	GPM	Unknown Well Use	280		N
42549	34829	BED		118	182	6				5612679	700298	21	60	GPH	Unknown Well Use	273		N
42541	34845	BED		10	205	4	VERY SLOW			5614280	699508	100	0		Unknown Well Use	273		N
42534	34846	BED		143	152	4				5613322	699749	125	10	GPM	Unknown Well Use	273		N
42564	34979	BED		50	125	6				5613122	703041	55	6	GPM	Unknown Well Use	273		N
42532	35108	BED		196	215	6				5612932	698357	125	20	GPM	Unknown Well Use	No mapped UNC aquifer		N

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WELL ID	WELL TAG NUMBER	AQUIFER LITHOLOGY CODE[1]	ARTESIAN FLOW VALUE	BEDROCK DEPTH (FT)	DEPTH WELL DRILLED (FT)	DIAMETER (IN)	GENERAL REMARKS	GROUNDWATER FLAG	SURFACE SEAL DEPTH (FT)	UTM NORTH (M)	UTM EAST (M)	WATER DEPTH (FT)	YIELD	YIELD UNITS	WELL USE	Interpreted Aquifer[2]	Notes	In LSA ?
42467	35289	BED		31	70		CUSTOMER WANTED SCREEN AT 41' BUT 20 SLOT SCREEN WOULD PRODUCE ABOUT 2 GPM IF PUMP WAS SET IN SCREEN, PULLED SCREEN AND PIPE.			5610495	691408		0		Unknown Well Use	No Mapped UNC Aquifer		N
42396	35341	BED		18	120	6				5612697	675196	2	2	GPM	Unknown Well Use	No Mapped Aquifer		Y
42480	35358	BED		75	155					5610635	691193	32	1	GPM	Unknown Well Use	273		N
42449	35462	BED		30	200	6				5611199	690766	20	3	GPM	Unknown Well Use	273		N
42468	35463	BED		38	50	4	3 GPM. PUMP RECOMMENDED SETTING 1' ABOVE SCREEN LOCATION.			5610597	691656	5	3	GPM	Unknown Well Use	273		N
42451	35485	BED			210	6				5610203	690657	75	20	GPM	Unknown Well Use	No mapped UNC aquifer		N
42465	35496	BED			54					5610934	691366	14	0		Unknown Well Use	No Mapped UNC Aquifer		N
42466	35522	BED		25	39	4	WELL PUMPED AT 2 GPM. RECOMMEND PUMP SET NO LOWER THAN 35'. PUMPED 6 HOURS A/SUBMERSIBLE			5610495	691408	20	2	GPM	Unknown Well Use	273		N
42448	35541	BED		24	217	6	DRY HOLE			5610424	690622		0		Unknown Well Use	No mapped UNC aquifer		N
42464	35667	BED		38	50					5610594	691466	6	3	GPM	Unknown Well Use	No Mapped UNC Aquifer		N
42555	36062	BED			58					5613762	699759		0		Unknown Well Use	280		N
42461	36439	BED			117	6				5610173	691584		4	GPM	Unknown Well Use	No mapped UNC aquifer		N
42552	36441	BED		20	122	6.5				5614084	700067	30	10	GPM	Unknown Well Use	273		N
42406	36445	BED		230	310	5.5				5616879	671205	240	5	GPM	Unknown Well Use	727		N
42554	36652	BED		24	105					5613623	699730	25	5	GPM	Unknown Well Use	273		N
42524	36863	UNC			80					5617221	694382	27	18	GPM	Unknown Well Use	286		N
56874	37047	BED			30	6				5612972	700241	18	300	GPH	Unknown Well Use	280		N
42536	37058	BED		118	130	6				5612342	700081	6	10	GPM	Unknown Well Use	280		N
42556	37262	BED		35	170	6				5613340	699783	135	10	GPM	Unknown Well Use	273		N
42620	38001	UNC			295	8				5616620	702124	27	325	GPM	Unknown Well Use	286		N
42542	38583	BED			233	6				5613428	699638	184	10	GPM	Unknown Well Use	280		N
42407	38900	BED			46	4	WATER LEVEL AUG. 13/79. 9.59' BELOW TOP CASING (PUMP OFF). 12.88' (PUMP ON).			5617755	670517		0		Unknown Well Use	728		N
42409	38906	BED			15					5617729	670266	11	0		Unknown Well Use	728		N
42416	39498	BED			303	6				5617444	670225	201	20	GPM	Unknown Well Use	728		N

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WELL ID	WELL TAG NUMBER	AQUIFER LITHOLOGY CODE[1]	ARTESIAN FLOW VALUE	BEDROCK DEPTH (FT)	DEPTH WELL DRILLED (FT)	DIAMETER (IN)	GENERAL REMARKS	GROUNDWATER FLAG	SURFACE SEAL DEPTH (FT)	UTM NORTH (M)	UTM EAST (M)	WATER DEPTH (FT)	YIELD	YIELD UNITS	WELL USE	Interpreted Aquifer[2]	Notes	In LSA ?
42372	39499	BED		36	140	6				5618363	667180	11	6	GPM	Unknown Well Use	727		N
42371	40144	BED		18	300	5.5				5618553	667449	240	30	GPH	Unknown Well Use	727		N
42533	40385	BED		135	180		WATER HARD, BRACKISH TASTING.			5613317	699747	150	7	GPM	Unknown Well Use	273		N
42535	40544	BED		190	205	6				5613312	699594	169	10	GPM	Unknown Well Use	280		N
42450	41436	BED		98	303	6				5610206	690801	68	0.5	GPM	Unknown Well Use	273		N
42373	41445	BED		18	190	5				5617999	667280	30	85	GPH	Unknown Well Use	727		N
42410	41451	BED			50	5.5				5617800	670259	38	0		Unknown Well Use	728		N
42617	41656	UNC			355	3				5616883	700519	15	0		Unknown Well Use	286		N
42548	42089	BED			154					5612892	700060		4	GPM	Unknown Well Use	280		N
42413	42100	BED		60	64	6				5617252	671055		50	GPM	Unknown Well Use	728		N
42411	42251	BED			62	6				5617359	671019		40	GPM	Unknown Well Use	728		N
42414	42328	BED			91	8				5617170	670987	9	200	GPM	Unknown Well Use	728		N
42299	42348	BED		32	92	6				5605180	695181	14	0.5	GPM	Unknown Well Use	273		N
42300	42402	BED		36	120	6				5605297	695305	12	15	GPM	Unknown Well Use	273		N
42557	42648	BED		178	200	6				5613381	699871	113	0.5	GPM	Unknown Well Use	273		N
42527	42764	BED						Y		5610524	699168		0		Unknown Well Use	285		N
42565	43097	BED		52	60	6				5612088	702824	15	30	GPM	Unknown Well Use	273		N
42415	43155	BED			68	6				5617572	670686	22	40	GPM	Unknown Well Use	728		N
42294	51160	BED		10	300	7				5608153	689438	20	1	GPM	Unknown Well Use	276		N
42550	43666	BED		101	104	6				5613987	699751		5	GPM	Unknown Well Use	273		N
56861	44027	BED			14					5618079	668434		20	GPM	Unknown Well Use	No Mapped UNC Aquifer		N
56860	44032	BED			14		THE WELL IS LOCATED ON A VISIBLE UNDERGROUND STREAM.			5618239	668171		20	GPM	Unknown Well Use	No Mapped UNC Aquifer		N
42682	44547	BED			120	8	1986 OWNER: H.MILLER			5620024	668186	45	300	GPM	Irrigation	728		N
42395	44663	BED		26	60	5.5	THIS WELL SERVICES LOT 13 BUT IS LOCATED ON LOT 14. CURRENT OWNER IS WILLIAM WATERSTON.			5618145	668104	12	20	GPM	Private Domestic	727		N
42545	44696	BED			105					5614043	699709		10	GPM	Unknown Well Use	No Mapped UNC Aquifer		N
42391	44739	BED		15	440	6.5				5618557	668028	40	3	GPM	Unknown Well Use	727		N
42389	44740	BED		27	80	5.5				5618308	668282		5	GPM	Private Domestic	727		N
42390	44743	BED		33	120	5.5				5618369	668237	25	5	GPM	Private Domestic	727		N

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WRBC ENTRIES																BGC INTERPRETATIONS		
WELL ID	WELL TAG NUMBER	AQUIFER LITHOLOGY CODE[1]	ARTESIAN FLOW VALUE	BEDROCK DEPTH (FT)	DEPTH WELL DRILLED (FT)	DIAMETER (IN)	GENERAL REMARKS	GROUNDWATER FLAG	SURFACE SEAL DEPTH (FT)	UTM NORTH (M)	UTM EAST (M)	WATER DEPTH (FT)	YIELD	YIELD UNITS	WELL USE	Interpreted Aquifer[2]	Notes	In LSA ?
42538	44744	BED		131	300					5612976	700014		0.5	GPM	Unknown Well Use	273		N
42289	51604	BED		70	280	6		N		5607544	690771		1.5	GPM	Observation Well	276		N
42378	44916	BED		25	240	5.5				5618757	667196	180	3	GPM	Private Domestic	727		N
42392	44918	BED		20	500	5.5				5618579	667765		5	GPM	Private Domestic	727		N
42383	44947	BED		35	340	5.5				5618660	667070		3	GPM	Private Domestic	727		N
56859	44975	BED		15	495	6				5618648	667578	120	3	GPM	Private Domestic	727		N
56875	45110	BED		103	103	6				5612799	702848	98	15	USGM	Private Domestic	285		N
42377	45230	BED		10	550	5.5				5618656	667490	300	2.5	GPM	Private Domestic	727		N
42393	45285	BED			40	5.5	THIS WELL SERVICES LOT # 5 BUT IS DRILLED ON LOT 14. LATEST OWNER IS MATTHEW NORRIS.			5618128	668163	10	5	GPM	Private Domestic	No mapped UNC aquifer		N
42576	45329	BED			58	6				5613367	703500	54	2	USGM	Private Domestic	285		N
42680	45331	BED			102	10				5619243	669370	19	260	USGM	Unknown Well Use	728		N
42522	45423	BED		80	430	5	DEC. 10/85. HAD CONSIDERABLE PROBLEMS WITH THE DRILLING OF THIS WELL (I.E. DEBATE OVER DEPTH OF WELL, WELL NOT DRILLED STRAIGHT, AMOUNT OF WATER AVAIL.ECT			5616447	692744		0		Unknown Well Use	273		N
42296	45576	BED		26	396		DRY HOLE			5605469	691670		0		Unknown Well Use	No Mapped UNC Aquifer		N
42619	45619	UNC			190					5615688	702771		12	GPM	Unknown Well Use	286		N
42412	45687	BED		45	385	6				5617460	669725		1	GPM	Unknown Well Use	727		N
42386	45703	BED			14		1990 CURRENT OWNER: MARK HUGO			5618133	668290		20	GPM	Unknown Well Use	No Mapped UNC Aquifer		N
42469	45762	BED		22	65	4.5				5610323	691379	28	2.5	GPM	Unknown Well Use	273		N
56876	46334	BED		60	60	6				5612131	702834	5	30	USGM	Unknown Well Use	285		N
42436	46577	BED			44	6				5609588	689120	22	30	GPM	Unknown Well Use	278		Y
42423	47311	BED		17	283					5619148	671368		2	GPM	Private Domestic	727		N
42422	47515	BED		10	410					5619268	671465		4	GPM	Private Domestic	727		N
42297	47760	BED		16	80	6				5604770	692690	14	8	GPM	Private Domestic	273		N
42369	47809	BED		24	235	6				5617284	669048		0		Unknown Well Use	727		N
42397	48188	BED		5	210	6				5612618	675085	13	0		Other	No Mapped Aquifer		Y
42370	48221	BED		22	64	6				5617182	668940	10	2	GPM	Private Domestic	727		N

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WELL ID	WELL TAG NUMBER	AQUIFER LITHOLOGY CODE[1]	ARTESIAN FLOW VALUE	BEDROCK DEPTH (FT)	DEPTH WELL DRILLED (FT)	DIAMETER (IN)	GENERAL REMARKS	GROUNDWATER FLAG	SURFACE SEAL DEPTH (FT)	UTM NORTH (M)	UTM EAST (M)	WATER DEPTH (FT)	YIELD	YIELD UNITS	WELL USE	Interpreted Aquifer[2]	Notes	In LSA ?
42419	48346	BED		80	350	7				5616709	672261	58	2.5	GPM	Unknown Well Use	727		N
42482	48349	BED		35	150	6.5				5615447	673540	57	100	GPM	Unknown Well Use	727		N
42539	48786	BED		110	250	6				5613057	700044		0		Private Domestic	273		N
42546	49000	BED		43	145	6				5613446	699440	50	3	GPM	Private Domestic	273		N
112	59107	BED			57	6.5				5610440	689085	33	8	GPM	Private Domestic	277		Y
100133	99251	UNC			37		PITLESS UNIT: WELDED, NEW. SHOE: WELDED ON. RECOMMENDED PUMP TYPE: SUB. RECOMMENDED PUMPING RATE: 15 USGPM.	N		5610454	689670	25	15	USGM	Private Domestic	277		Y
42529	49244	BED						Y		5610720	699614		0		Unknown Well Use	285		N
42474	49694	BED		60	145	6				5610210	691008	48	5	GPM	Private Domestic	273		N
42586	49883	BED		100	350	5.5				5613866	703755	31	3	GPM	Private Domestic	273		N
62848	61348	BED		10	500	6				5608012	690228	50	1.7	GPM	Private Domestic	276		N
42452	51599	BED		84	325	6				5611227	690392	200	12	GPM	Private Domestic	273		N
42399	51601	BED		75	280	6.5				5612109	677599		2	GPM	Private Domestic	No Mapped Aquifer		Y
42401	44792	BED		5	175					5613354	678882	20	2.5	GPM	Unknown Well Use	276		Y
42454	51605	BED		22	140	6				5610517	690407		0.3	GPM	Private Domestic	273		N
42376	51614	BED		40	605	6				5618875	667662	445	2	GPM	Private Domestic	727		N
42374	51615	BED			205		CLEAN OUT EXISTING WELLS -WESTERLY MOST WELL: 16 GPM, 20' STATIC WATER LEVEL, 205' DEPTH. EASTERLY MOST WELL: DEPTH BEYOND 300', VERY LITTLE WATER.			5618527	667387	20	16	GPM	Unknown Well Use	No Mapped UNC Aquifer		N
42417	51627	BED		230	480	5	VERY POOR WATER (ALKILI) AND RATES. HAD WELL DEEPENED TO GET A BETTER FLOW, BUT IT HAD CAVED IN - LEVEL BACK TO 300'.			5617150	669901		0.3	GPM	Private Domestic	727		N
42558	51632	BED		103	250	5.5				5613434	699935	140	3	GPM	Private Domestic	273		N
106	58648	BED		32	264	6.5				5613427	678831	62	2.5	GPM	Commercial and Industrial	276		Y
42481	51654	BED		25	280	6				5610199	691154		5	GPM	Private Domestic	273		N
42421	51656	BED		8	300	7	RIGHT BESIDE OLD WELL. GOOD WATER - HASN'T BEEN USED FOR A YEAR.			5619197	670236	112	1.5	GPM	Unknown Well Use	727		N
42418	51660	BED		45	300	7				5616691	672085	40	2	GPM	Unknown Well Use	727		N

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WELL ID	WELL TAG NUMBER	AQUIFER LITHOLOGY CODE[1]	ARTESIAN FLOW VALUE	BEDROCK DEPTH (FT)	DEPTH WELL DRILLED (FT)	DIAMETER (IN)	GENERAL REMARKS	GROUNDWATER FLAG	SURFACE SEAL DEPTH (FT)	UTM NORTH (M)	UTM EAST (M)	WATER DEPTH (FT)	YIELD	YIELD UNITS	WELL USE	Interpreted Aquifer[2]	Notes	In LSA ?
42455	51664	BED		79	320	6	NOTE: WELL CAN BE DEEPENED, BUT USE UNDER 6" GAUGE BIT, BECAUSE THE BIT WE USED WAS ALMOST WORN OUT.			5610803	690781		2	GPM	Private Domestic	273		N
42292	32352	BED		57	200	6				5608129	689623	23	3	GPM	Unknown Well Use	276		N
42528	54343	BED						Y		5610726	699484		0		Unknown Well Use	285		N
45611	54365	BED		88	100	6		Y		5610423	698989	15	0		Unknown Well Use	285		N
42683	54675	BED			138	7				5619702	668702		0		Unknown Well Use	728		N
42526	54947	BED			115					5610165	698691	66	25	GPM	Unknown Well Use	285		N
42587	54954	BED		35	240	7				5613424	703255		6	GPM	Unknown Well Use	273		N
42420	55866	BED			285					5617841	671415		4	GPM	Private Domestic	727		N
56878	56260	BED			64	7				5613348	703493	54	0		Unknown Well Use	285		N
42562	56376	BED		90	120	7				5613118	703254	78	10	GPM	Unknown Well Use	273		N
42577	56377	BED			90					5613127	703263	70	20	GPM	Unknown Well Use	285		N
42290	43320	BED		14	80					5608013	689627	26	5	GPM	Unknown Well Use	276		N
56840	57033	BED			80	7	120' DRY WELL WITH CASING 20' AND SHOE.			5607218	689643	30	0		Unknown Well Use	No Mapped UNC Aquifer		N
56866	57122	BED			175	7				5617787	670717	68	0		Unknown Well Use	728		N
56862	57135	BED		30	240	7				5618472	668119	20	0		Unknown Well Use	727		N
56863	57238	BED			75	6	WATER CLOUDY, SOME SILT			5613379	673207	45	0		Unknown Well Use	No Mapped Aquifer		N
56879	57574	BED			62	7				5613322	703483	57	0		Unknown Well Use	285		N
56877	57809	BED		63	180	7				5613122	703140	73	0		Unknown Well Use	273		N
56935	57812	BED			72.5	7				5613236	703374	63	0		Unknown Well Use	285		N
100	58052	BED		30	180	6.5	DRY HOLE			5604173	694691		0		Abandoned	273		N
56873	58118	BED			157	7				5618432	683926	20	40	GPM	Unknown Well Use	284		N
56864	58120	BED		22	225	6				5615404	673331	5	0		Unknown Well Use	727		N
56865	58128	BED		7	265	6				5615334	673334	80	0		Unknown Well Use	727		N
56897	58188	BED			157	7				5620125	668263	132	8	GPM	Private Domestic	728		N
56868	58455	BED		53	53	7				5610814	689444		0		Unknown Well Use	No Mapped UNC Aquifer		Y
61080	59938	BED		52	520					5610465	689075		0.3	USGM	Private Domestic	275		Y
63085	61615	BED		12	120	6				5610224	689334		0.3	GPM	Private Domestic	275		Y
42443	2459	BED			12					5611444	688867	6	0		Private Domestic	277		Y

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WELL ID	WELL TAG NUMBER	AQUIFER LITHOLOGY CODE[1]	ARTESIAN FLOW VALUE	BEDROCK DEPTH (FT)	DEPTH WELL DRILLED (FT)	DIAMETER (IN)	GENERAL REMARKS	GROUNDWATER FLAG	SURFACE SEAL DEPTH (FT)	UTM NORTH (M)	UTM EAST (M)	WATER DEPTH (FT)	YIELD	YIELD UNITS	WELL USE	Interpreted Aquifer[2]	Notes	In LSA ?
42445	4381	BED			5					5612014	688530	2	0		Private Domestic	277		Y
56867	58502	BED		79	200	7	DRY HOLE			5611426	689621		0		Unknown Well Use	No mapped UNC aquifer		N
59646	58610	BED			97	6				5619918	668219	52	100	GPM	Private Domestic	728		N
42293	31169	BED		17	160	5				5608497	689306	5	8	GPM	Unknown Well Use	276		Y
119	58681	BED			62	6	NOT ENOUGH WATER FOR IRRIGATION WELL. ABANDON WELL. THIS WELL IS BACKFILLED.			5619509	669332		0		Abandoned	728		N
120	58687	BED			180		WELL COULD PRODUCE 25 GPM AFTER GRAVEL PACK.WELL ABANDONED DUE TO SILT & DIRTY GRAVEL. ABANDONED.			5619501	669278		0		Abandoned	728		N
118	58689	BED			82	6.5				5619426	669378	26	100	GPM	Private Domestic	728		N
108	58709	BED		28	260	6.5				5618209	671027		1	GPM	Private Domestic	727		N
105	58711	BED		7	200	6.5				5610002	682074		0.5	GPM	Commercial and Industrial	No Mapped Aquifer		Y
473	58712	BED		14	500	6				5610216	682491	126	2	GPM	Commercial and Industrial	No Mapped Aquifer		Y
113	58777	BED			90	6.5				5613544	703512		25	GPM	Private Domestic	285		N
42437	1322	BED			20		GOES DRY IN DRY YEAR.			5609299	688315	10	0		Private Domestic	278		Y
42442	16792	BED			20					5611473	688800	15	0		Private Domestic	277		Y
56872	58483	BED		29	29	7				5610372	689528		0		Unknown Well Use	277		Y
107	59126	BED		5	367	6.5				5618483	670969	180	2	GPM	Private Domestic	727		N
311	59289	BED		5	302	6.5				5610914	701031	80	0.5	GPM	Private Domestic	No Mapped Aquifer		N
310	59290	BED		73	74	6				5609732	698525		15	GPM	Private Domestic	No Mapped Aquifer		N
299	59480	BED			330	6.5				5615334	672830	60	10	GPM	Commercial and Industrial	No mapped UNC aquifer		N
519	59528	BED			330	6				5610820	699902	80	0.5	GPM	Private Domestic	No mapped UNC aquifer		N
309	59550	BED		52	200	5				5618610	670317	60	1	GPM	Private Domestic	727		N
522	59556	BED		12	240	6				5610215	691243	60	0.5	GPM	Private Domestic	273		N
59602	59653	BED			300	6	CASING PULLED AND HOLE ABANDONED			5609048	690330		1	GPM	Private Domestic	No mapped UNC aquifer		N
523	59889	BED			240	6				5611934	695576	30	0.3	GPM	Private Domestic	No Mapped Aquifer		N
63082	61609	BED		90	500	6				5610295	689361		0.8	GPM	Private Domestic	275		Y
60906	59953	BED			60	6				5608687	690395	24	25	USGM	Private Domestic	No mapped UNC aquifer		N
61081	59954	BED		70	240	6		N		5609169	690910		10	USGM	Private Domestic	273		N
61089	60175	BED		140	240		DRY WELL			5618954	669027		0		Private Domestic	727		N

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WELL ID	WELL TAG NUMBER	AQUIFER LITHOLOGY CODE[1]	ARTESIAN FLOW VALUE	BEDROCK DEPTH (FT)	DEPTH WELL DRILLED (FT)	DIAMETER (IN)	GENERAL REMARKS	GROUNDWATER FLAG	SURFACE SEAL DEPTH (FT)	UTM NORTH (M)	UTM EAST (M)	WATER DEPTH (FT)	YIELD	YIELD UNITS	WELL USE	Interpreted Aquifer[2]	Notes	In LSA ?
61086	60178	BED			112					5619354	668194		6	GPM	Private Domestic	728		N
61087	60179	BED			120					5619317	668296		12	GPM	Private Domestic	728		N
61088	60190	BED			44					5619016	668570		15	GPM	Private Domestic	728		N
60902	60191	BED			70					5618466	669380	29	4	GPM	Private Domestic	No Mapped UNC Aquifer		N
60903	60194	BED		25	120					5618455	669165		0		Private Domestic	727		N
60905	60195	BED		24	120					5618440	669278		4	GPM	Private Domestic	727		N
61091	60197	BED			30					5618585	668944		10	GPM	Private Domestic	728		N
61092	60198	BED		33	40		DRY HOLE CASING WAS RECOVERED			5618525	669164		0		Private Domestic	728		N
60904	60199	BED		30	40		DRY CASING PULLED			5618514	669277		0		Private Domestic	727		N
61085	60200	BED		110	300		FAULT AT 180'			5619147	669050		4	GPM	Private Domestic	727		N
61090	60204	BED		60	60		NEEDS SCREEN			5618917	668970		12	GPM	Private Domestic	727		N
61084	60210	BED			300		PUMP TEST NEEDED			5618940	667697		0		Private Domestic	No Mapped UNC Aquifer		N
61078	60295	BED		18	300					5612931	694926		3	GPM	Private Domestic	273		N
63083	61612	BED		25	100	6				5610252	689339		2.5	GPM	Private Domestic	275		Y
61076	60400	BED		50	300		PRESSURE FRACTURE N/C			5611302	701724		1.5	GPM	Private Domestic	No Mapped Aquifer		N
61083	60428	BED		40	400					5617655	670643	220	1	GPM	Private Domestic	727		N
61077	60440	BED		130	290					5610248	698641	160	3.5	GPM	Private Domestic	No Mapped Aquifer		N
42291	2572	BED			22					5609242	689090	12	0		Private Domestic	278		Y
812	61024	BED			263	6				5608672	694229	20	0.3	GPM	Private Domestic	No mapped UNC aquifer		N
819	61025	BED		6	385	6	DRY HOLE			5608732	693360		0		Private Domestic	273		N
820	61026	BED		32	304	6	DRY HOLE			5609071	693795		0		Private Domestic	273		N
826	61027	BED			104	6				5609323	693341	22	18	GPM	Private Domestic	No mapped UNC aquifer		N
62612	61028	BED			243	6				5609162	694265	10	1	GPM	Private Domestic	No mapped UNC aquifer		N
62613	61029	BED			305	6				5611770	692354	9	1	GPM	Private Domestic	No mapped UNC aquifer		N
62614	61030	BED			260	6				5611749	692388	13	0.8	GPM	Private Domestic	No mapped UNC aquifer		N
62615	61031	BED		18	223	6				5611395	692497	22	8	GPM	Private Domestic	273		N
62616	61035	BED			420	6				5608353	697128	30	0.3	GPM	Private Domestic	No Mapped Aquifer		N
62620	61037	BED			302	6				5608387	697083	23	0.2	GPM	Private Domestic	No Mapped Aquifer		N
2197	61245	BED		74	100	6				5608622	690418	18	15	GPM	Private Domestic	273		N
61079	60301	BED		93	100					5610329	689081	80	8	GPM	Private Domestic	275		Y

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62767	61255	BED		40	41	6				5610455	689457	6	40	GPM	Private Domestic	275		Y
63087	61617	BED		32	32	6				5610194	689289	5	60	GPM	Private Domestic	275	Well Lith Interpreted based on log	Y
62776	61266	BED		150	280	6		N		5609719	689808	90	15	GPM	Private Domestic	273		Y
62779	61269	BED		35	220	6		N		5609152	689769	30	20	GPM	Private Domestic	273		Y
62780	61270	BED		45	140	6	WELL PRODUCED WATER BUT BELOW MEASURABLE LIMITS.	N		5608996	690061		0		Private Domestic	273		Y
62781	61271	BED		40	40	6	WELL ACTUALLY DRILLED TO 200 FT. BUT WAS BACKFILLED TO 40 FT.	N		5609026	690015	10	6	GPM	Private Domestic	273		Y
42523	51634	BED		20	300	5				5614717	680753		10	GPM	Commercial and Industrial	276		Y
42402	54338	BED		45	360	6				5614651	680854		10	GPM	Private Domestic	276		Y
56870	58476	BED		57	597	7	DRY			5610579	689501		0		Unknown Well Use	275		Y
56871	58480	BED		34	57	7	DRY, HOLE ABANDONED			5610370	689485		0		Unknown Well Use	275		Y
2218	61248	BED		50	280	6	DRY HOLE			5610203	689453		0		Private Domestic	275		Y
2239	61252	BED		10	60	6	DRY HOLE			5610256	689512		0		Private Domestic	275		Y
63081	61607	BED		45	500	6				5610168	689255		0		Private Domestic	275		Y
63161	61703	BED		45	500	6				5615511	673006		3	GPM	Private Domestic	727		N
63181	61725	BED		18	300	6	THIS WELL MAY HAVE BEEN LOGGED ON COMPUTER TWICE.			5613005	694964		3	GPM	Private Domestic	273		N
63185	61729	BED		10	160	6				5618089	668319	110	2.5	GPM	Private Domestic	727		N
63186	61730	BED		15	320	6				5618387	668225		2	GPM	Private Domestic	727		N
63206	61750	BED		30	200	6				5620105	670451	5	3	GPM	Private Domestic	No Mapped Aquifer		N
63207	61751	BED		40	300	6				5620157	670325	20	2	GPM	Private Domestic	No Mapped Aquifer		N
63209	61753	BED		30	200	6				5620200	670519		1	GPM	Private Domestic	No Mapped Aquifer		N
63210	61754	BED			380	6	THIS WELL WAS DEEPENED TO 380 FT FROM 200FT			5618534	667970		2	GPM	Private Domestic	727		N
42457	10	BED		36	440	6				5612340	687309	40	0		Unknown Well Use	276		Y
72271	67887	BED		35	180	6	120 FEET SW OF HOUSE, STEEL CASING, +2 TO 35, SLOTTED PVC 0 TO180 DRILLER: FRESH CLEAR WATER	N		5608006	690145	90	3		Private Domestic	276		N
69860	71444	BED			360	6	CASING 0.0 TO 17.0, PUMP TEST RATE 15 GPM,360 FT AFTER HRS	N		5614883	700060	100	0		Not Specified	NA	Well Lith Interpreted based on log	N

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WRBC ENTRIES																BGC INTERPRETATIONS		
WELL ID	WELL TAG NUMBER	AQUIFER LITHOLOGY CODE[1]	ARTESIAN FLOW VALUE	BEDROCK DEPTH (FT)	DEPTH WELL DRILLED (FT)	DIAMETER (IN)	GENERAL REMARKS	GROUNDWATER FLAG	SURFACE SEAL DEPTH (FT)	UTM NORTH (M)	UTM EAST (M)	WATER DEPTH (FT)	YIELD	YIELD UNITS	WELL USE	Interpreted Aquifer[2]	Notes	In LSA ?
76126	76287	BED			220	6	DEER RD NR CHERRY CREEK WATER BEARING FRACTURES @ 195' 201' 208', CUST SUPPLIED PVC LINER ROPE & GLUE, F	N		5619479	670880	22	3.3	USGM	Private Domestic	727	Well Lith Interpreted based on log	N
76127	76288	BED			400	6	DEER RD NR CHERRY CREEK SOFT ZONES & FRACTURES @ 255' 277' 288' 321', HOLE WAS PRESSURE FRACTURED W PACK	N		5619476	670884	120	0.5	USGM	Private Domestic	727	Well Lith Interpreted based on log	N
76128	76289	UNC			137	6	RODEO DR NR CHERRY CREEK WELL WAS DRILLED OPEN HOLEM FROM 137'-200' & BACK FILLED BACK TO 137' W 1/4" SAN	N		5618584	669140	17	0.8	USGM	Private Domestic	728	Well Lith Interpreted based on log	N
76129	76290	UNC			53	6	RODEO DR NR CHERRY CREEK	N		5618576	669146	38	12	USGM	Private Domestic	728	Well Lith Interpreted based on log	N
76131	76292	UNC			41	6	NR CHERRY CREEK	N		5619253	669312	5	12	USGM	Private Domestic	728	Well Lith Interpreted based on log	N
76132	76293	BED			260	6	RODEO DR NR CHERRY CREEK F BIT SIZE 6 1/16", SOFT SPOTS @ 81',102',111',140-142 FRACTURED SOFT @ 195',217	N		5618567	669144	100	2	USGM	Private Domestic	727	Well Lith Interpreted based on log	N
76171	76332	BED			153	6	CAMPBELL CREEK RD BARNHARTVALE SOFTER WATER BEARING FRACTURES @ 108 130 150'	N		5610686	698870	70	8	USGM	Private Domestic	273	Well Lith Interpreted based on log	N
76177	76338	BED			196	6	WELL 1 CHERRY CREEK SOFT & FRACTURED ZONES @ 93 131 135 160-190 193-196', WELL WAS ABONDONED BECAUSE	N		5617962	671137		0		Private Domestic	NA	Well Lith Interpreted based on log	N
76178	76339	BED			500	6	WELL 2 CHERRY CREEK SOFT & FRACTURED ZONES @ 82 86 101 222 258 416 437 481'	N		5617951	671126	240	13	GPH	Private Domestic	727	Well Lith Interpreted based on log	N
76179	76340	BED			280	6	WELL 3 CHERRY CREEK SOFT & FRACTURED ZONES @ 104 115 170 209 219 233 240 260', WATER BEARING FRACTUR	N		5617957	671141	39	4	USGM	Private Domestic	727	Well Lith Interpreted based on log	N
76180	76341	BED			600	6	WELL 4 CHERRY CREEK SOFT SPOTS & FRACTURES @ 72 89 121 140 164 185 199 205 243 264 270 316 395 405 4	N		5617946	671134	210	0.5	USGM	Private Domestic	727	Well Lith Interpreted based on log	N
76181	76342	BED			170	6	WELL 5 CHERRY CREEK SOFT SPOTS & FRACTURES @ 87 105 110 130 142 154 160', WELL WAS ABANDONED BECAUSE	N		5617957	671131		0		Private Domestic	NA	Well Lith Interpreted based on log	N

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76193	76354	BED			600	6	WELL 6 CHERRY CREEK SOFT SPOTS @ 270 278 317 463 479 516', WELL WAS PRESSURE FRACTURED WITH PACKER S	N		5617949	671140		0.2	USGM	Private Domestic	NA	Well Lith Interpreted based on log	N
76268	76429	UNC			78	6	CHERRY CREEK RANCH WELL WAS DRILLED & CASED TO 90' THEN CASING PULLED BACK TO CLEANER FORMATION FOR	N		5619451	669708	13	100	USGM	Private Domestic	728	Well Lith Interpreted based on log	N
76269	76430	BED			520	6	3A-7 KNUTSFORD BEDROCK IN HOLE VERY FRACTURED WILL PROB CAVE IN IN TIME, SLITE TRACE OF WATER L	N		5610850	690778		0		Private Domestic	NA	Well Lith Interpreted based on log	N
76282	76443	BED			274	6	END OF ORTON RD 3A-7 KNUTSFORD	N		5610850	690750	36	0.1	USGM	Private Domestic	273	Well Lith Interpreted based on log	N
76314	76475	BED			480	6	1/2 M SW OF WATER TOWER ROSEHILL RD KAML SOFT & FRACTURED ZONES @ 77 145 165 170 282 303 341 344 438 444', WATER BEARING	N		5613801	691334	32	2.2	USGM	Private Domestic	273	Well Lith Interpreted based on log	N
76358	76519	BED				6	N OF ROSEHILL RD E OF ORTON RD KNUTSFORD FRACTURES @ 65 78 80 88 100 108 117 125', 125-147 SOFT & FRACTURED, 147-2-2 HARD	N		5610808	690834		0		Private Domestic	NA	Well Lith Interpreted based on log	N
76360	76521	BED			700	6	E SIDE OF ORTON RD KNUTSFORD SOFT SPOTS & FRACTURES 179 250 269 290 370-380 SOFT WITH CHUNKS 482 670' WATER B	N		5610596	690804	42	4	USGM	Private Domestic	273	Well Lith Interpreted based on log	N
77227	77837	BED			500	6	DEER RD NR CHERRY CREEK SOFT ZONES & FRACTURES @ 35' 54' 73' 105' 167' 249' 251' 255' 258' 298' 441', HO	N		5619850	671152	111	0.3	USGM	Private Domestic	No Mapped Aquifer		N
77228	77838	BED			220	6	RODEO DR NR CHERRY CREEK F BIT SIZE 5 7/8", SOFT ZONES & FRACTURES @ 121',132',159',180',188',199',216',2	N		5618628	668967	89	2.5	USGM	Private Domestic	727	Well Lith Interpreted based on log	N
79785	80436	BED			300	6	4" 160 PSI PVC LINER INSTALLED	N		5618551	669135	14	0.8	USGM	Private Domestic	727	Well Lith Interpreted based on log	N
79838	80489	BED			520	6	CAPPED, 4" 160 PSI PVC LINER INSTALLED	N		5617972	667314	24	0.6	USGM	Private Domestic	727	Well Lith Interpreted based on log	N
79853	80504	BED			640	6	HOLE #4 CAPPED, 4" 160 PSI PVC LINER INSTALLED FROM 12' TO 640'	N		5610412	691601	17	10	USGM	Private Domestic	273	Well Lith Interpreted based on log	N
79854	80505	BED			700	6	HOLE #3 CAPPED, 4" 160 PSI PVC LINER INSTALLED FROM 13' TO 700'	N		5610389	691659	50	4	USGM	Private Domestic	273	Well Lith Interpreted based on log	N

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79856	80507	BED			500	6	HOLE #5 CAPPED, DRY HOLE	N		5610406	691631		0.2	USGM	Private Domestic	NA	Well Lith Interpreted based on log	N
79857	80508	BED			280	6	HOLE #1 CAPPED	N		5610421	691645	50	0.2	USGM	Private Domestic	273	Well Lith Interpreted based on log	N
79858	80509	UNC			200	6	HOLE #2 CAPPED	N		5610424	691664	50	0.8	USGM	Private Domestic	No mapped UNC aquifer	Well Lith Interpreted based on log	N
79859	80510	BED			360	6	HOLE #6 CAPPED, 4" 160 PSI PVC LINER INSTALLED FROM 26' TO 360'	N		5610435	691614	17	40	USGM	Private Domestic	273	Well Lith Interpreted based on log	N
83435	82671	UNC			216	6	DRIVER SHOE; CASING: WELDED	N		5612312	702494	150	40	USGM	Private Domestic	No mapped UNC aquifer	Well Lith Interpreted based on log	N
83446	82682	BED		50	220	6	DRIVER SHOE; CASING: WELDED; OPEN HOLE 60 TO 220 FT	N		5611998	702906	30	20	USGM	Irrigation	273	Well Lith Interpreted based on log	N
83466	82702	UNC			197	6	DRIVER SHOE; CASING: WELDED	N		5612259	702495	150	20	USGM	Private Domestic	No mapped UNC aquifer	Well Lith Interpreted based on log	N
83725	82913	UNC			177	6	DRIVER SHOE; CASING: WELDED; FITTINGS TOP K PACKER BOTTOM BAIL	N		5612410	702469	154	20	USGM	Private Domestic	No mapped UNC aquifer	Well Lith Interpreted based on log	N
84561	83743	UNC			217	6	WATER QUALITY & QUANTITY NOT GUARANTEED BY CONTRACTOR.	N		5612391	702505		30	USGM	Private Domestic	NA	Well Lith Interpreted based on log	N
84679	83861	BED		203	214	6	ALUMINUM CAP	N		5606459	690108		1.5	USGM	Private Domestic	NA	Well Lith Interpreted based on log	N
84701	83883	UNC			172	6	ALUMINUM CAP	N		5618577	669132		9	USGM	Private Domestic	NA	Well Lith Interpreted based on log	N
84704	83886	BED		285	355	6	There was an issue with the Well OWNER please manually update STEEL LID WELDED ON	N		5619969	667820		0.2	USGM	Private Domestic	NA	Well Lith Interpreted based on log	N
85066	84247	BED			760	6	CAPPED. 4 160 PSI PVC LINER INSTALLED ?-760'. WATER @ 140-160,340-360,500-560'	N		5611333	691582		8	USGM	Private Domestic	NA	Well Lith Interpreted based on log	N
85067	84248	BED			600	6	CAPPED	N		5611367	691555		1.5	USGM	Private Domestic	NA	Well Lith Interpreted based on log	N
85069	84250	BED			400	6	CAPPED. NO LINER INSTALLED.	N		5611369	691587		1	USGM	Private Domestic	NA	Well Lith Interpreted based on log	N
85111	84292	BED		478	520	6	CAPPED. 4 160 PSI PVC LINER INSTALLED FROM 9.5-520'. YIELD = APPROX 150 PER DAY	N		5609630	688636		0		Private Domestic	NA	Well Lith Interpreted based on log	Y
85115	84296	BED			100	6	CAPPED. DRY HOLE.	N		5607566	691558		0	DRY	Private Domestic	NA	Well Lith Interpreted based on log	N
85116	84297	BED			200	6	CAPPED. DRY HOLE.	N		5610288	690976		0	DRY	Private Domestic	NA	Well Lith Interpreted based on log	N
85121	84302	UNC			110	6	CAPPED	N		5610371	698616		50	USGM	Private Domestic	No Mapped Aquifer	Well Lith Interpreted based on log	N
85205	84386	BED			400	6	CAPPED	N		5613850	692076		0.2	USGM	Private Domestic	NA	Well Lith Interpreted based on log	N
85207	84388	BED			700	6	CAPPED. 4 160 PSI PVC LINER INSTALLED	N		5617980	669463		0.7	USGM	Private Domestic	NA	Well Lith Interpreted based on log	N
85557	84736	UNC			160	6		N		5614805	686845		15	USGM	Private Domestic	NA	Well Lith Interpreted based on log	N
85813	84992	BED		135	420	6	SHOE: BARBER. OPEN HOLE FROM 140 TO 420 FEET.	N		5609356	685939		1.5	USGM	Private Domestic	NA	Well Lith Interpreted based on log	Y
86606	85768	UNC			100		RISER 2; 18 SLOT SCREEN BAIL BOTTOM	N	20	5619351	668260	68	2	USGM	Private Domestic	NA	Well Lith Interpreted based on log	N

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88184	87298	BED			56.39		LIMITED INFORMATION FROM SCHEDULE 2 FORM	N		5613917	685861		0		Water Supply System	No Mapped Aquifer	Well Lith Interpreted based on log	N
88185	87299	BED					LIMITED INFORMATION FROM SCHEDULE 2 FORM	N		5613873	685863		0		Water Supply System	No Mapped Aquifer	Well Lith Interpreted based on log	N
89065	88178	BED		23	440			N	20	5618842	669162		2	USGM	Private Domestic	NA	log completion lithology not specified in well database, assumed to be bedrock based on depth to bedrock measurement	N
90863	89963	BED		29	304		MEASUREMENTS: GROUND LEVEL. SOFT SPOTS & FRACTURES, 166, 289, HOLE WAS PRESSURE FRACTURED W/PAKCER@ 60' WAS PRODUCING ABOUT .33 GAL, BEFORE FRACTURING. SHOE: WELDED ON, DRIVEN INTO BEDROCK. GROUT: CUTTING. RECOMMENDED PUMP TYPE: SUB. RECOMM	N		5610853	699893	30.5	2	USGM	Private Domestic	273		N
91069	90169	BED		80	200			N	20	5606752	691768		1	USGM	Private Domestic	NA	log completion lithology not specified in well database, assumed to be bedrock based on depth to bedrock measurement	N
95268	94386	UNC		198	197		SCREEN: ALSO USED RISER.	N	20	5607235	680787		20	USGM	Private Domestic	No Mapped Aquifer		Y
96240	95358	BED		80	320		DRY HOLE. GEOTHERMAL WELL.	N	20	5601221	692820		0	DRY	Not Specified	273		N
98104	97222	BED		115.25	504		CLASS OF WELL: GEOTHERMAL	N	18	5618512	669482		0		Not Specified	727		N
98117	97235	BED		31	504			N	18	5618401	669702	100	1	USGM	Private Domestic	727		N
72273	67889	BED		30	340	6	STEEL CASING, +2 TO 30, PVC 6 TO 340 DRILLER: FRESH CLEAR WATER	N		5608276	689483	20	1		Private Domestic	276	Well Lith Interpreted based on log	N
98590	97708	UNC			148		HOLE 2	N	20	5613718	702058		20	USGM	Private Domestic	285		N
98591	97709	UNC			151		HOLE 3	N	20	5613684	702112	102	0		Private Domestic	No Mapped UNC Aquifer		N
98604	97722	UNC			151		HOLE 4 LOT 6	N	20	5613390	702143	131	5	USGM	Private Domestic	285		N
98605	97723	UNC			160		LOT 4	N	20	5613571	702088	131	10	USGM	Private Domestic	285		N
98606	97724	UNC			162			N	20	5613478	702117	130	10	USGM	Private Domestic	285		N
98635	97753	BED		29	254		CASING DETAILS TYPE SECOND LINE PVC 160 PSI.	N	18	5609311	696929	15	1.75	USGM	Private Domestic	No Mapped Aquifer		N
98641	97759	BED		190	320		HOLE #1	N	20	5613787	702048		5	USGM	Private Domestic	273		N
98654	97772	BED		6	120			N	8	5617233	669447	81	3	USGM	Private Domestic	727		N
98655	97773	BED		50	300		METHOD OF DRILLING: AIR & DUAL ROTARY.	N	20	5617724	669493		1.5	USGM	Private Domestic	727		N
98975	98093	BED		94	492			N	18	5610171	690934	68	6	USGM	Private Domestic	273		N
99570	98688	BED		250	260			N	20	5617400	670054		30	USGM	Irrigation	727		N

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99575	98693	BED						N	20	5618538	668003		1	USGM	Private Domestic	727		N
99840	98958	BED			205			N		5610301	691198	10	5	USGM	Not Specified	273		N
99910	99028	BED		97	462		NTS MAP 092I069411 LOCATION ACCURACY G SOFT SPOTS & FRACTURES 117 120 176 217 280 315 365-370 399 412 436 453 LESS THAN 0.125 GPM SHOE WELDED ON TEST DATE 99/09/14 RECOMMENDED PUMP TYPE SUB	N		5614785	691724	152	0		Not Specified	NA	log completion lithology not specified in well database, assumed to be bedrock based on depth to bedrock measurement	N
99913	99031	UNC			50.5		SHOES WELDED ON. WELL YIELD ESTIMATE ONLY. SCREEN TYPE JOHNSON. BOTTOM SCREW IN BOTTOM.	N		5619590	668700	31.75	30	USGM	Private Domestic	728		N
99916	99034	UNC			78		RECOMMENEDED PUMP TYPE SUB. SCREEN TYPE JOHNSON.	N		5619620	668700		120	USGM	Not Specified	728		N
99921	99039	UNC			85		SCREEN TYPE JOHNSON. SCREEN BOTTOM SCREW IN. RECOMMENDED PUMP TYPE SUB. WELL YIELD ESTIMATE ONLY.	N		5619650	668700		30	USGM	Private Domestic	728		N
99924	99042	BED		73	201		SHOES WELDED ON.	N		5619777	668760		0.13	USGM	Private Domestic	727		N
99934	99052	BED			302		MEASUREMENTS FROM GROUND LEVEL. SHOE WELDED ON. RECOMMENDED PUMP TYPE SUB.	N		5608755	694518		0.125	USGM	Private Domestic	273		N
99950	99068			110			SHOES WELDED ON & DRIVEN	N		5619327	667992		0		Private Domestic	NA	Log completion lithology not specified in well database	N
100020	99138	BED			103		MEASUREMENTS FROM GROUND LEVEL. PITLESS UNIT WELDED, NEW. SHOE WELDED ON & DRIVEN. RECOMMENDED PUMP TYPE SUB. RECOMMENDED PUMPING RATE 1.5 USGPM.	N		5604876	692646	18	1.5	USGM	Private Domestic	273		N
56869	58488	BED			33	7				5610565	689469		0		Unknown Well Use	277		Y
102356	101474	BED		9	155		SHOE = WELDED ON; GROUT = BENTONITE CHIPS & CUTTINGS;	N		5618491	669062		0.5	USGM	Private Domestic	727		N
102360	101478	BED		58	94		PERFORATIONS = 64' - 84'; SHOE = WELDED ON; GROUT = BENTONITE CHIPS & CUTTINGS; RECOMMENDED PUMP TYPE = SUB; RECOMMENDED PUMPING RATE - 18 USGPM MAX; WELL YIELD ESTIMATE ONLY;	N		5618491	669082	60	18	USGM	Private Domestic	727		N

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102546	101664	UNC			180		MEASUREMENTS: GROUND LEVEL. CASING WAS STOPPED AT 117 FEET DRILLED OPEN HOLD TO 180 FEET WELL WAS ABANDONED AT THIS POINT. SHOE: WELDED ON. METAL LID WELDED ON.	N		5619540	669226		0		Private Domestic	NA	Well Lith Interpreted based on log	N
102547	101665	BED		70	214		MEASUREMENTS FROM: GROUND LEVEL; PEROFRATIONS = 184-204; SHOE = WELDED ON; GROUT = BENTONITE CHIPS & CUTTINGS; RECOMMENDED PUMP TYPE/PUMPING RATE = SUB, 2.5 USGPM MAX;	N		5618979	668683	115	2.5	USGM	Private Domestic	NA	log completion lithology not specified in well database, assumed to be bedrock based on depth to bedrock measurement	N
105143	104261	UNC			76		DRIVE SHOE BB	N	20	5610584	699261	40	20	USGM	Private Domestic	NA	Well Lith Interpreted based on log	N
105454	104572	BED		68	502		well yield estimated: approximately 600 USgpday. Liner recommended. WELL INSPECTION REPORT AVAILABLE FROM REGIONAL OFFICE.	N	18	5609720	688966		0.4	USGM	Private Domestic	NA	Well Lith Interpreted based on log	Y
105703	104821	UNC		125	116		DRIVE SHOE: BB.	N	20	5610112	689074		0		Private Domestic	NA	Well Lith Interpreted based on log	Y
105704	104822	BED		184	396		DRIVE SHOE: BB. HOLE #1	N	20	5609082	689430		0		Private Domestic	NA	log completion lithology not specified in well database, assumed to be bedrock based on depth to bedrock measurement	Y
106025	105143	BED		40.08	85		TO DEEPEN AT LATER DATE.	N	19	5618828	668867		0		Private Domestic	NA	log completion lithology not specified in well database, assumed to be bedrock based on depth to bedrock measurement	N
106027	105145	BED		4	214		PLASTIC CASING MATERIAL & LINER: 160 PSI PVC.	N	17	5617519	669123	58.5	8	USGM	Private Domestic	NA	log completion lithology not specified in well database, assumed to be bedrock based on depth to bedrock measurement	N
106056	105174	UNC			138.4			N	19	5619590	668361	108	30	USGM	Private Domestic	NA	Well Lith Interpreted based on log	N
106799	105917	UNC			78			N	42	5618336	670191	18	30	USGM	Private Domestic	NA	Well Lith Interpreted based on log	N
106836	105954	BED		12	255		CASING/LINER PVC THICKNESS: 160 PSI. LINER PERFORATED: 174'-194'-214-'-235'.	N		5609697	693724	10	0.5	USGM	Private Domestic	NA	log completion lithology not specified in well database, assumed to be bedrock based on depth to bedrock measurement	N
107557	106675	BED		70	96		WELL RECORD SUBMITTED THROUGH EWELLS BY DRILLING COMPANY. ORIGINAL COORDINATES PROVIDED: 120.453611, 50.691389 (OFFSET SLIGHTLY AS SAME AS WTN 106676).	N		5618597	679854		0		Commercial and Industrial	No Mapped Aquifer	log completion lithology not specified in well database, assumed to be bedrock based on depth to bedrock measurement	N

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107558	106676	BED		71	503	10	well not complete, surface seal and screens yet to be installed. WELL RECORD SUBMITTED THROUGH EWELLS BY DRILLING COMPANY. UPDATED INFO FOR WELL PROVIDED 2013-06-24. WELL COMPLETED 2012-12-21 BY KELLY PELLETIER FOR JR DRILLING CENTRAL.	N		5618600	679850		0		Water Supply System	No Mapped Aquifer	Well Lith Interpreted based on log	N
42673	30	BED		160	190	7				5619851	666312	130	4	GPM	Private Domestic	727		N
59576	1182	UNC					SEE NTS REPORT 92I/10 #4	Y		5621106	666836		0		Private Domestic	728		N
59578	1207	BED					SEE NTS REPORT 92 I/10 # 4.	Y		5620969	667635		0		Private Domestic	727		N
59575	1221	BED					SEE NTS REPORT 92I/10 #4	Y		5620905	667585		0		Private Domestic	727		N
59577	1223	UNC					SEE NTS REPORT 92 I/10 #4.	Y		5621069	666763		0		Private Domestic	728		N
42506	14911	UNC			26	6	PUMPED AT 3 GPM FOR 5 1/2 HOURS, DRAWDOWN 42"			5619473	688259	11	3	GPM	Private Domestic	283	Log completion lithology not specified in well database	N
42507	14914	UNC			35	6	PUMPED FOR 5 HOURS AT 12 GPM - DRAWDOWN 4 FT.			5619361	688560	15	12	GPM	Private Domestic	283	Log completion lithology not specified in well database	N
42486	18234	UNC			58	6	YIELD - 8 GPM AT 43'. PUMPING LEVEL - 43'			5617896	688743	29	8	GPM	Unknown Well Use	283	Log completion lithology not specified in well database	N
42511	18607	UNC			74	6	YIELD 2 GPM.			5619382	688139	16	2	GPM	Unknown Well Use	283	Log completion lithology not specified in well database	N
42499	18608	UNC			54	6	YIELD 4 US GPM. 20' DRAWDOWN, PUMPED FOR 2 HOURS.			5619219	688569	17	4	USGM	Unknown Well Use	283	Log completion lithology not specified in well database	N
42514	23857	UNC			110	6	YIELD 30 GPM BY PUMPING FOR 2 HOURS. PUMPING LEVEL 25 FT FROM SURFACE. WATER RECOVERY 3 MINUTES TO STATIC LEVEL.			5618850	688989	6	30	GPM	Unknown Well Use	283	Log completion lithology not specified in well database	N
42616	26749	UNC			113	6				5617220	699765	29	30	GPM	Unknown Well Use	286		N
42679	29507	UNC			230	4.5	1990 CURRENT OWNER: G.LUCIA			5620469	667403		40	GPM	Irrigation	728		N
42685	30381	UNC			110	4	1990 CURRENT OWNER:D.ROSS WATER GROSS TASTING.			5620510	667289		30	GPM	Unknown Well Use	728		N
42515	31042	UNC			116					5619186	689046		0		Unknown Well Use	283	Log completion lithology not specified in well database	N
42516	31099	UNC			60		DRY			5619120	689049		0		Unknown Well Use	283	Log completion lithology not specified in well database	N
42517	31115	UNC			20	4	DRY HOLE			5618851	689051		0		Unknown Well Use	283	Log completion lithology not specified in well database	N
42500	31122	UNC			35					5619254	688756	23	10	GPM	Unknown Well Use	283	Log completion lithology not specified in well database	N
42503	31899	UNC			23	4				5619301	688725	12	0		Unknown Well Use	283	Log completion lithology not specified in well database	N
42686	32943	UNC			144	6				5620715	666676	104	20	GPM	Unknown Well Use	728		N

Table E-1. WRBC Registered Well Search Results within the RSA

WRBC ENTRIES																BGC INTERPRETATIONS		
WELL ID	WELL TAG NUMBER	AQUIFER LITHOLOGY CODE[1]	ARTESIAN FLOW VALUE	BEDROCK DEPTH (FT)	DEPTH WELL DRILLED (FT)	DIAMETER (IN)	GENERAL REMARKS	GROUNDWATER FLAG	SURFACE SEAL DEPTH (FT)	UTM NORTH (M)	UTM EAST (M)	WATER DEPTH (FT)	YIELD	YIELD UNITS	WELL USE	Interpreted Aquifer[2]	Notes	In LSA ?
42497	34169	UNC			32	4	20 GPM. RECOMMENDED PUMP SETTING AT 29'			5618323	689409	18	20	GPM	Unknown Well Use	283	Log completion lithology not specified in well database	N
42488	34988	UNC			42					5618082	689540	22	20	GPM	Unknown Well Use	283	Log completion lithology not specified in well database	N
42502	35865	UNC			195	6				5618847	688705	10	6	GPM	Unknown Well Use	283	Log completion lithology not specified in well database	N
42501	36112	UNC			264	6				5618850	688809	12	3	GPM	Unknown Well Use	283	Log completion lithology not specified in well database	N
42498	36127	UNC			36					5618103	689464	20	0		Unknown Well Use	283	Log completion lithology not specified in well database	N
42489	36827	UNC			50		WELL DRY, JUNE 1980			5617961	689419	18	20	GPM	Unknown Well Use	283	Log completion lithology not specified in well database	N
42687	36865	UNC			80	6.5				5620924	666724		100	GPM	Unknown Well Use	728		N
42285	39755	BED		17	135					5603570	689512	18	1	GPM	Unknown Well Use	274		Y
42684	39759	BED		159	180	5.5				5620414	667798	159	0		Unknown Well Use	727		N
42495	41449	UNC			60		DEC. 11/85 - APPROXIMATE LOCATION OF WELL OBTAINED FROM RANDY MC DONNELL, KAMLOOPS INDIAN BAND LAND ADMINISTRATOR.			5617935	688952	32	0		Unknown Well Use	283	Log completion lithology not specified in well database	N
42494	41934	UNC			98	6				5617840	688948	32	20	GPM	Unknown Well Use	283	Log completion lithology not specified in well database	N
42490	41950	UNC			197	6				5618139	689618	10	30	GPM	Unknown Well Use	283	Log completion lithology not specified in well database	N
42496	43354	UNC			50	6	DEC. 11/85 - APPROXIMATE LOCATION OF WELL OBTAINED FROM RANDY MCDONNELL, KAMLOOPS INDIAN BAND LAND ADMINISTRATOR.			5617891	689111	29	10	GPM	Unknown Well Use	283	Log completion lithology not specified in well database	N
56894	44031	BED		200	340	6				5619646	666796	160	4	GPM	Private Domestic	727		N
42384	44289	BED		200	340	5.5				5619715	666878	160	4	GPM	Private Domestic	727		N
42672	44322	BED		15	460	7				5619346	666277	30	2	GPM	Private Domestic	727		N
42671	44333	BED		13	360	7				5619233	666476	40	26	GPM	Private Domestic	727		N
42675	44346	BED		20	280	7				5619372	666442	40	5	GPM	Private Domestic	727		N
42674	44391	BED		20	220	7				5619582	666499	40	4	GPM	Private Domestic	727		N
42382	44720	BED		43	233	6.5				5618965	667188	40	8	GPM	Private Domestic	727		N
42493	45101	UNC			59	5				5618085	689395		0		Unknown Well Use	283	Log completion lithology not specified in well database	N
42491	45525	UNC			260					5618005	689548		0		Unknown Well Use	283	Log completion lithology not specified in well database	N
42492	45545	UNC			112	6	NOV. 12/85 - WELL NOT IN USE. ON INDIAN BAND WATER SYSTEM.			5617991	689598	21	30	USGM	Unknown Well Use	283	Log completion lithology not specified in well database	N

Table E-1. WRBC Registered Well Search Results within the RSA

WRBC ENTRIES																BGC INTERPRETATIONS		
WELL ID	WELL TAG NUMBER	AQUIFER LITHOLOGY CODE[1]	ARTESIAN FLOW VALUE	BEDROCK DEPTH (FT)	DEPTH WELL DRILLED (FT)	DIAMETER (IN)	GENERAL REMARKS	GROUNDWATER FLAG	SURFACE SEAL DEPTH (FT)	UTM NORTH (M)	UTM EAST (M)	WATER DEPTH (FT)	YIELD	YIELD UNITS	WELL USE	Interpreted Aquifer[2]	Notes	In LSA ?
42487	45811	UNC			80	5	WELL STILL IN USE (NOV. 12/85), ALTHOUGH WATER VERY POOR QUALITY (LOADED WITH MINERALS). DON'T USE FOR DRINKING. NOT ON INDIAN BAND WATER SYSTEM.			5617907	688398	21	12	GPM	Unknown Well Use	283	Log completion lithology not specified in well database	N
42691	46003	UNC			127	6				5620550	667512	63	40	USGM	Private Domestic	728		N
42525	46206	UNC			255	6				5617483	697232	38	10	USGM	Private Domestic	286		N
42677	48016	UNC			375					5620168	667120		0		Unknown Well Use	728		N
42678	48060	UNC			164					5620141	667458	131	30	GPM	Private Domestic	728		N
42375	50163	BED		25	400	6.5				5619065	667202	85	8	GPM	Unknown Well Use	727		N
42676	51606	BED		337	480	6				5620099	667116	200	5	GPM	Private Domestic	727		N
42689	51607	UNC			80	6				5620652	667329		80	GPM	Private Domestic	728		N
42690	52368	UNC			128	8				5620603	667432	80	50	GPM	Irrigation	728		N
42693	54673	UNC			75	7				5620689	667168	26	150	GPM	Unknown Well Use	728		N
42692	54674	UNC			75	7				5620674	667091	24	45	GPM	Unknown Well Use	728		N
42696	55347	UNC			77	7				5620638	667210		100	GPM	Unknown Well Use	728		N
56896	56081	UNC			280	7				5620115	667221	120	30	GPM	Unknown Well Use	728		N
56895	57384	UNC			138	7				5620246	667221	115	50	GPM	Private Domestic	728		N
59637	59895	UNC			300	6		N		5600118	679982	20	1	GPM	Private Domestic	No Mapped Aquifer		Y
61123	60371	BED		18	400					5619232	666366	40	2	GPM	Private Domestic	727		N
61122	60373	UNC			80					5620916	666781		150	GPM	Other	728		N
63106	61643	UNC			223	6				5619839	667623	90	15	GPM	Private Domestic	728		N
63107	61647	UNC			192	6				5619833	667266	65	15	GPM	Private Domestic	728		N
63187	61731	UNC			110	6	THIS WELL IS ON LOT 5 PLAN 22149 BY WAY OF EASEMENT			5620340	667373	110	100	GPM	Private Domestic	728		N
63188	61732	BED		290	440	6				5620050	667161		2.5	GPM	Private Domestic	727		N
84760	83942	BED		240	245	6	ALUMINUM CAP	N		5603986	689672		2.5	USGM	Private Domestic	274	log completion lithology not specified in well database, assumed to be bedrock based on depth to bedrock measurement	Y
84769	83951	BED		370	430	6	ALUMINUM CAP	N		5602401	689658		3	USGM	Private Domestic	274	log completion lithology not specified in well database, assumed to be bedrock based on depth to bedrock measurement	Y
83719	82907	BED		48	200	6	DRIVER SHOE; CASING: WELDED; OPEN HOLE FROM 60-200FT DIAMETER 6INS	N		5602416	689641	40	6	USGM	Private Domestic	274	log completion lithology not specified in well database, assumed to be bedrock based on depth to bedrock measurement	Y

Table E-1. WRBC Registered Well Search Results within the RSA

WRBC ENTRIES																BGC INTERPRETATIONS		
WELL ID	WELL TAG NUMBER	AQUIFER LITHOLOGY CODE[1]	ARTESIAN FLOW VALUE	BEDROCK DEPTH (FT)	DEPTH WELL DRILLED (FT)	DIAMETER (IN)	GENERAL REMARKS	GROUNDWATER FLAG	SURFACE SEAL DEPTH (FT)	UTM NORTH (M)	UTM EAST (M)	WATER DEPTH (FT)	YIELD	YIELD UNITS	WELL USE	Interpreted Aquifer[2]	Notes	In LSA ?
102433	101551	BED		189	254		MEASUREMENTS FROM: GROUND LEVEL; PERFORATIONS: FROM 214-234'; SHOE = WELDED ON & DRIVEN; RECOMMENDED PUMP TYPE/PUMPING RATE = SUB, 6 USGPM MAX; SWL AFTER 1.5 HRS	N		5602978	688175	164	6	USGM	Private Domestic	274	log completion lithology not specified in well database, assumed to be bedrock based on depth to bedrock measurement	Y
84714	83896	UNC			188	6	ALUMINUM CAP. WELL WAS PULLED BACK TO 188' TO SET SCREEN IN GRAVEL SEAM.	N		5620058	667620		8	USGM	Private Domestic	728	log completion lithology not specified in well database, assumed to be unconsolidated since depth of bedrock is unkown	N
84737	83919	UNC			98	6	ALUMINUM CAP	N		5620673	667453		40	USGM	Private Domestic	728	log completion lithology not specified in well database, assumed to be unconsolidated since depth of bedrock is unkown	N
84680	83862	BED		258	263	6	ALUMINUM CAP	N		5604840	690177		10	USGM	Private Domestic	274	log completion lithology not specified in well database, assumed to be bedrock based on depth to bedrock measurement	Y
84761	83943	BED		373	393	6	ALUMINUM CAP. WELL SHOULD BE PUMP TESTED TO OBTAIN THE MOST ACCURATE FLOW RATE.	N		5619396	666707		1.5	USGM	Private Domestic	727	log completion lithology not specified in well database, assumed to be bedrock based on depth to bedrock measurement	N
76265	76426	BED		13	160	6.625	SOFT SPOTS AND FRACTURES AT 35 45 48 52 57 63 65 74 82 99 117 121 137 FEET. WATER BEARING FRACTURES AT 35 117 137 150 FEET. MOST OF WATER AT 137 FEET. RECOMMENDED PUMP TYPE: SUB.	N		5606122	689487	26	12	USGM	Private Domestic	274	log completion lithology not specified in well database, assumed to be bedrock based on depth to bedrock measurement	Y
84779	83961	UNC			114	6	ALUMINUM CAP. BACK FILLED AFTER 1/2 HR.	N		5620477	667221		25	USGM	Private Domestic	728	log completion lithology not specified in well database, assumed to be unconsolidated since depth of bedrock is unkown	N
84814	83996	UNC			148.5	6	There was an issue with the Well OWNER please manually update ALUM CAP. DUE TO LOW STATIC LVL, WELL MAY PUMP MORE WITH PUMP THAN WITH AIR LIFT	N		5620931	666351		1	USGM	Private Domestic	728	log completion lithology not specified in well database, assumed to be unconsolidated since depth of bedrock is unkown	N
85232	84413	UNC			218	6	CAPPED	N		5616518	704714		300	USGM	Private Domestic	286	log completion lithology not specified in well database, assumed to be unconsolidated since depth of bedrock is unkown	N
91035	90135	BED		309	626			N	15	5620055	667372		0		Private Domestic	727	log completion lithology not specified in well database, assumed to be bedrock based on depth to bedrock measurement	N
98112	97230	UNC			360			N	18	5620417	666933	228	15	USGM	Private Domestic	728		N
98717	97835	BED		330	600			N	20	5620169	667487		1.5	USGM	Private Domestic	727		N

Table E-1. WRBC Registered Well Search Results within the RSA

WRBC ENTRIES																BGC INTERPRETATIONS		
WELL ID	WELL TAG NUMBER	AQUIFER LITHOLOGY CODE[1]	ARTESIAN FLOW VALUE	BEDROCK DEPTH (FT)	DEPTH WELL DRILLED (FT)	DIAMETER (IN)	GENERAL REMARKS	GROUNDWATER FLAG	SURFACE SEAL DEPTH (FT)	UTM NORTH (M)	UTM EAST (M)	WATER DEPTH (FT)	YIELD	YIELD UNITS	WELL USE	Interpreted Aquifer[2]	Notes	In LSA ?
98939	98057	UNC		9	98		SCREEN: 92'-94' BLANK RISER.	N	19	5621000	666400	58	0		Private Domestic	728		N
99878	98996	BED		63	302		NTS MAP 992I077221 LOCATION ACCURACTY J SOFT SPOTS & FRACTURES 150 174 180 194 250 257 1 GPM 278 294 PERFORATIONS 220-280' SHOE WELDED ON TEST DATE 99/07/11 OF 1 HRS REC PUMP TYPE SUB RATE 2 MAX USGPM	N		5619512	666286	69	2	USGM	Private Domestic	727	log completion lithology not specified in well database, assumed to be bedrock based on depth to bedrock measurement	N
84619	83801	BED		155	176	6	WATER QUALITY & QUANTITY NOT GUARANTEED BY CONTRACTOR	N		5602556	690498		25	USGM	Private Domestic	274	log completion lithology not specified in well database, assumed to be bedrock based on depth to bedrock measurement	Y
100137	99255	UNC			94.5		LINE S OF TRANS CAN HIWAY W6M CASING WEIGHT 12.9 LB/FT WELDED NEW SHOE WELDED ON & DRIVEN SCREEN TYPE JOHNSON FROM 90.5 TO 94.5 LENGTH 2 & 4 FITTING TOP KPACKER SCREW IN BOTTOM DEV SURGING & AIR DATE 05/09/16 REC PUMP TYPE SUB RATE 25	N		5620959	666225	43.5	30	USGM	Private Domestic	728		N
100140	99258	UNC			137		SHOE: WELDED ON. RECOMMENDED PUMP TYPE: SUB. RECOMMENDED PUMPING RATE: 35 USGPM MAX.	N		5620220	667766	96.5	35	USGM	Private Domestic	728		N
100141	99259	UNC			99		WELL TYPE 4 LINE S OF TRANS CAN W6M CASING WEIGHT 12.9 LB/FT WELDED NEW SHOE WELDED ON & DRIVEN SCREEN TYPE JOHNSON LENGTH 2 & 4 FITTING KPACKER TEST 05/09/17 REC PUMP TYPE SUB RATE 25 MAX USGPM	N		5620960	666224	42.12	35	USGM	Private Domestic	728		N
100143	99261	UNC			97		WELL TYPE 2 LINE S OF TRANS CAN HWY W6M CASING WEIGHT 12.9 LB/FT WELDED NEW SHOE WELDED ON SCREEN TYPE JOHNSON LENGTH 2 & 4 FITTINGS TOP KPACKER BOTTOM SCREW IN DEV BY SURGING & AIR DATE 05/09/15 REC PUMP TYPE SUB RATE 30 USGPM	N		5620858	666321	42	40	USGM	Private Domestic	728		N

Table E-1. WRBC Registered Well Search Results within the RSA

WRBC ENTRIES																BGC INTERPRETATIONS		
WELL ID	WELL TAG NUMBER	AQUIFER LITHOLOGY CODE[1]	ARTESIAN FLOW VALUE	BEDROCK DEPTH (FT)	DEPTH WELL DRILLED (FT)	DIAMETER (IN)	GENERAL REMARKS	GROUNDWATER FLAG	SURFACE SEAL DEPTH (FT)	UTM NORTH (M)	UTM EAST (M)	WATER DEPTH (FT)	YIELD	YIELD UNITS	WELL USE	Interpreted Aquifer[2]	Notes	In LSA ?
100147	99265	UNC			104		WELL TYPE 1 LINE S OF W TRANS CAN HWY W6M CASING WEIGHT 12.9 LB/FT WELDED NEW SHOE WELDED ON & DRIVEN SCR TYPE JOHNSON LENGTH 2 & 4 FITTINGS KPACKER SCREW IN BOTTOM DEV BY SURG & AIR TEST DATE 05/09/14 REC PUMP TYPE SUB RATE 10	N		5620909	666477	44	12	USGM	Private Domestic	728		N
100152	99270	UNC			95		WELL TYPE 5. CASING WEIGHT 12.9 LB/FT WELDED NEW SHOE WELDED ON & DRIVEN SCREEN YPE JOHNSON LENGTH 2 & 4 FITTINGS KPACKER SCREW IN BOTTOM TEST DATE 05/09/19 REC PUMP TYPE SUB RATE 5 USGPM	N		5620855	666430	39.5	5	USGM	Private Domestic	728		N
99940	99058	BED			26.25			N		5603534	689742	30.5	25	USGM	Private Domestic	274		Y
105787	104905	BED		205	236		METHOD OF DRILLING: AIR & DUAL ROTARY.	N	20	5619788	667165		0		Private Domestic	727	log completion lithology not specified in well database, assumed to be bedrock based on depth to bedrock measurement	N
107236	106354	UNC			327	8	Heave measured at 322'. Toc 340'3". WELL RECORD SUBMITTED THROUGH EWELLS BY DRILLING COMPANY.	N	20	5618448	689539	2	80	USGM	Irrigation	283	log completion lithology not specified in well database, assumed to be unconsolidated since depth of bedrock is unkown	N
42438	18385	BED			27					5609860	689009	20	0		Private Domestic	278		Y
107983	107101	UNC			337		WELL RECORD SUBMITTED THROUGH EWELLS BY DRILLING COMPANY.	N	20	5620150	666918	230	5	USGM	Private Domestic	728	log completion lithology not specified in well database, assumed to be unconsolidated since depth of bedrock is unkown	N
109205	108322	UNC			146	6		N	20	5620356	667579	90	50	USGM	Private Domestic	728	log completion lithology not specified in well database, assumed to be unconsolidated since depth of bedrock is unkown	N
109336	108453	BED		73	220	6	CASING: SHOE; WELDED ON, GROUT: BENTONITE CHIPS AND CUTTINGS	N		5610863	691004	48	0.33	USGM	Private Domestic	273		N

Notes:
1. Some lithology codes adjusted to reflect detailed log data.
2. Aquifers interpreted based on well location and documented aquifer lithology. Where aquifer lithology information was not included in the WRBC database but yield, radius and water depth were available for hydraulic conductivity estimation, individual logs were reviewed in detail to interpret aquifer lithology, and assign aquifer numbers to records. For details and aquifer descriptions, see text and Table 5 in main report.
3 Add a note about bedrock screen

APPENDIX F
PITEAU (2006) MONITORING WELL DETAILS AND HYDRAULIC HEAD DATA

Table reproduced from Piteau Associates (2006), Permit Level Hydrogeological Assessment for Tailings Storage Facility and Block Cave, New Afton Copper-Gold Project, Kamloops, B.C.. Report prepared for New Gold Inc. Hatch Associates, dated November 2006, Project. No.: 2807.

TABLE I
SUMMARY OF MONITORING WELL AND VIBRATING WIRE PIEZOMETER COMPLETION DETAILS

Well ID	Coordinates			Hole Diameter (mm)	Piezo-meter Dia. (mm)	Casing Stickup (m)	Top of Casing Elevation (m-geod)	Top of Screen Depth (m-bg)	Bottom of Screen Depth (m-bg)	Bottom of Screen Elevation (m-geod)	Screen Length (m)	Bottom of Sand Pocket (m-bg)	Sand Pocket Length (m)	Completion Zone Lithology
	UTM East	UTM North	Ground Elevation (m-geod)											
RES1-A	675129	5613541	710.00		50	1.1	711.087	18.64	21.64	688.4	3.0	22.23	4.4	bedrock
RES2	675461	5613807	724.00		50	0.7	724.7	15.8	18.85	705.2	3.1	19.13	3.36	bedrock
RES3	675829	5613682	726.00		50	1.2	727.2	15.6	18.6	707.4	3.0	18.64	3.56	till
RES4-A	674265	5614877	695.00		50	1.3	696.3	208.3	226.6	468.4	18.3	226.6	20.6	bedrock
RES 5	675368	5616062	673.00			1	674							
RES 6	676293	5614028	732.00			1.3	733.3							
AS-03	674962	5614271	702.00	vibrating wire		1	703		139.37	562.6		144	2.5	bedrock
BGC06-08	674788.6	5614698.0	718.53			0.77	719.3							
BGC06-10	674867.9	5614709.4	715.97			0.84	716.8							
BGC06-12	674974.6	5614600.7	701.41			0.85	702.3							
BGC06-13	675013.5	5615030.1	673.22			0.94	674.2							
BH-V1 P1	676147.4	5614264.6	727.49	83	19	0.93	728.418	33.41	34.93	612.89	1.52	34.93	4.10	bedrock
BH-V1 P2	676147.4	5614264.6	727.49	83	19	0.95	728.443	23.29	24.81	646.09	1.52	24.81	3.40	bedrock
BH-V2 P1	675751.0	5614155.9	733.30	83	19	1.08	734.377	73.76	75.29	486.30	1.52	75.29	3.00	bedrock
BH-V2 P2	675751.0	5614155.9	733.30	83	19	1.12	734.416	60.96	62.48	528.30	1.52	64.60	5.20	till
BH-V3 P1	675665.1	5613915.4	737.48	83	19	0.91	738.396	50.90	52.43	565.48	1.52	54.40	6.00	bedrock
BH-V3 P2	675665.1	5613915.4	737.48	83	19	0.94	738.423	38.71	40.23	605.48	1.52	52.70	5.50	waste / till
BH-V4	675833.2	5613595.1	729.48	83	50	0.95	730.435	19.51	21.03	660.48	1.52	21.03	4.20	till / bedrock
BH-V5	675569.1	5613267.3	730.60	83	19	1.01	731.614	30.18	31.70	626.60	1.52	31.70	3.21	bedrock
BH-V6 P1	676310.3	5613428.6	733.78	83	19	1.02	734.803	28.65	30.18	634.78	1.52	30.18	3.00	bedrock
BH-V6 P2	676310.3	5613428.6	733.78	112	19	0.97	734.755	10.44	11.96	694.53	1.52	12.00	3.60	till
BH-V8 P1	675201.0	5614135.5	734.67	83	19	0.91	735.582	101.80	103.33	395.67	1.52	103.33	4.20	bedrock
BH-V8 P2	675201.0	5614135.5	734.67	112	19	0.97	735.633	89.31	90.83	436.67	1.52	90.83	3.50	waste / till
PA-1 P1	676817.8	5613440.8	746.24	83	50	0.93	747.163	28.65	30.18	647.24	1.52	30.18	5.50	bedrock
PA-1 P2	676817.8	5613440.8	746.24	112	19	0.86	747.101	20.73	22.25	673.24	1.52	22.30	3.50	till
PA-2 P1	676900.7	5614022.1	741.45	112	50	1.04	742.483	43.89	45.42	592.45	1.52	45.42	3.60	bedrock
PA-2 P2	676901.1	5614022.5	741.46	83	50	1.02	742.485	5.79	7.32	717.46	1.52	7.32	3.00	till
PA-3 P1	676628.2	5615548.6	658.49	83	50	0.99	659.478	43.89	45.42	509.49	1.52	45.42	3.00	bedrock
PA-3 P2	676628.2	5615548.6	658.49	112	19	0.95	659.437	27.43	28.96	563.49	1.52	40.20	12.80	bedrock
UA 99			314.00	vibrating wire					35.80	278.20				bedrock
UA 101	675338.7	5614952.8	401.85	vibrating wire					77.45	324.40				bedrock

Notes:

1) Additional information on the RES and and BGC holes has been reported by BGC (2006a and 2006b) and by Rescan (2006).
2) btoc = below top of casing; asl = above sea level; bg = below ground level.
3) See monitoring well completion logs in Appendix A.
4) Coordinates listed for vibrating wire at collar. Transducer coordinates for the two underground holes are:

	Northing	Easting
UA 99	5614618.4	674899.2
UA 101	5615383.6	675037.0

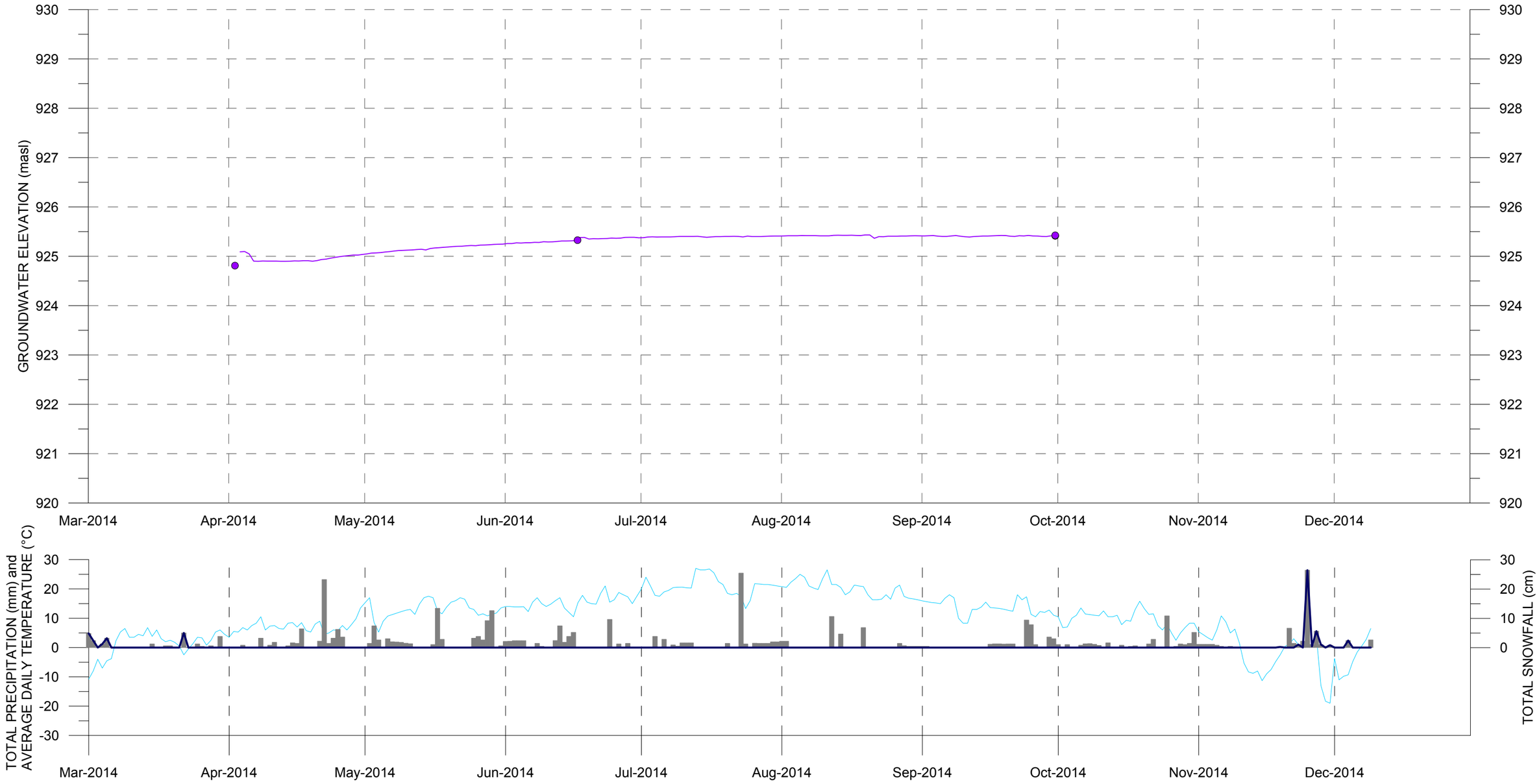
Table reproduced from: Piteau Associates (2006), Permit Level Hydrogeological Assessment for Tailings Storage Facility and Block Cave, New Afton Copper-Gold Project, Kamloops, B.C.. Report prepared for New Gold Inc. Hatch Associates, dated November 2006, Project. No.: 2807.

Table reproduced from Piteau Associates (2006), Permit Level Hydrogeological Assessment for Tailings Storage Facility and Block Cave, New Afton Copper-Gold Project, Kamloops, B.C.. Report prepared for New Gold Inc. Hatch Associates, dated November 2006, Project. No.: 2807.

TABLE IV
MONITORING WELL WATER ELEVATION DATA

	ELEVATION OF WATER[1] (m-asl)																			
	BH-V1 P1	BH-V1 P2	BH-V2 P1	BH-V2 P2	BH-V3 P1	BH-V3 P2	BH-V4	BH-V5	BH-V6 P1	BH-V6 P2	BH-V8 P1	BH-V8 P2	PA-1 P1	PA-1 P2	PA-2 P1	PA-2 P2	PA-3 P1	PA-3 P2	UA-99	UA-101
Ground Elev. (m-geod.)	727.5	727.5	733.3	733.3	737.5	737.5	729.5	730.6	733.8	733.8	734.7	734.7	746.2	746.2	741.4	741.5	658.5	658.5	314.0	401.9
Top of Casing (m-geod)	728.418	728.443	734.377	734.416	738.396	738.423	730.435	731.614	734.803	734.755	735.582	735.633	747.163	747.101	742.483	742.485	659.478	659.437	278.2	321.7
Piezo bottom (m)	34.9	24.8	62.5	75.3	52.4	40.2	21.0	31.7	30.2	12.0	103.3	90.8	30.2	22.3	45.4	7.3	45.4	29.0	109.7	80.2
Completion Zone	bedrock	surficial	bedrock	surficial	bdrk/surf	surficial	bedrock	bedrock	bedrock	bedrock	surficial	surficial	bedrock	surficial	bedrock	surficial	surficial	surficial	bedrock	bedrock
02-Aug-06																				
07-Sep-06	711.27	711.24	668.58	675.61	687.76	698.99	715.13	724.68												
08-Sep-06																				
11-Sep-06	711.24	711.20	671.93	675.50	689.90	698.74	715.12	724.68												
15-Sep-06	711.25	711.23	673.87	675.52	690.83	698.62	715.14	723.77	726.15	726.81	656.03	664.58	735.89	746.20	701.32	735.69	654.09	653.52		
19-Sep-06																	654.93	654.58		
20-Sep-06							715.17	723.77	726.77	726.79			739.95	744.77	717.10	736.81				
21-Sep-06	711.25	711.25	675.09	675.42	691.35	698.47					663.93	664.64								
22-Sep-06																				451.31
27-Sep-06	708.71	707.86					715.08	723.66	726.92	726.59			739.90	743.94					314.99	461.05
30-Sep-06																				
10-Oct-06																			425.72	480.37
11-Oct-06																	655.24			
12-Oct-06																		655.22		
18-Oct-06	708.76	704.22					715.08	723.65	646.90	726.55			743.27	743.20	736.98	736.99	655.24	655.22	432.99	480.49
22-Oct-06																			434.22	478.4

APPENDIX G
HYDROGRAPHS OF GROUNDWATER LEVELS WITHIN THE ACTIVE GROUNDWATER MONITORING NETWORK



MONITORING INTERVAL DETAILS

	SCREEN INT. (M ASL)	COLLAR EL. (M ASL)	HSU
BGC14-001D	912 TO 918	936	NICOLA GROUP
BGC14-001S	929 TO 930	934	GLACIAL TILL

CLIMATE DATA

- Total Precipitation (mm)
- Total Snowfall (cm)
- Average Daily Temperature (°C)

WATER LEVEL DATA

- BGC14-001D — DATALOGGER
- BGC14-001S ● MANUAL MEASUREMENT

GENERAL MONITORING LOCATION

TSF

NOTES:
1) WELL LOCATIONS SHOWN ON DRAWING 03; WELL COMPLETION DETAILS SUMMARIZED IN TABLE 1.
2) BOREHOLE LOGS INCLUDED IN APPENDIX A.
3) CLIMATE DATA FROM ENVIRONMENT CANADA, KAMLOOPS AIRPORT AND KAMLOOPS PRATT ROAD STATION (2014).
4) HSU = HYDROSTRATIGRAPHIC UNIT; VWP = VIBRATING WIRE PIEZOMETER; TSF = TAILINGS STORAGE FACILITY; EMRSF = EAST MINE ROCK STORAGE FACILITY; SMRSF = SOUTH MINE ROCK STORAGE FACILITY.

SCALE: AS SHOWN	DRAWN: CK	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY	PROJECT: AJAX PROJECT ENVIRONMENTAL ASSESSMENT BASELINE GROUNDWATER HYDROLOGY ASSESSMENT
DATE: AUG 2015	CHECKED: CK	KGHM AJAX MINING INC.	TITLE: BGC14-001 GROUNDWATER ELEVATION TIME SERIES WITH METEOROLOGICAL DATA
PROJECT No.: 1125007-03	APPROVED: BM		FIG No.: G-1

C:\Exports\01_TSF_PIEZ_BGC14-001.grf

MONITORING INTERVAL DETAILS

	SCREEN INT. (M ASL)	COLLAR EL. (M ASL)	HSU
BGC14-002D	902 TO 908	925	NICOLA GROUP
BGC14-002S	910 TO 916	925	GLACIAL TILL

CLIMATE DATA

- Total Precipitation (mm)
- Total Snowfall (cm)
- Average Daily Temperature (°C)

WATER LEVEL DATA

- BGC14-002D
- BGC14-002S
- DATALOGGER
- MANUAL MEASUREMENT

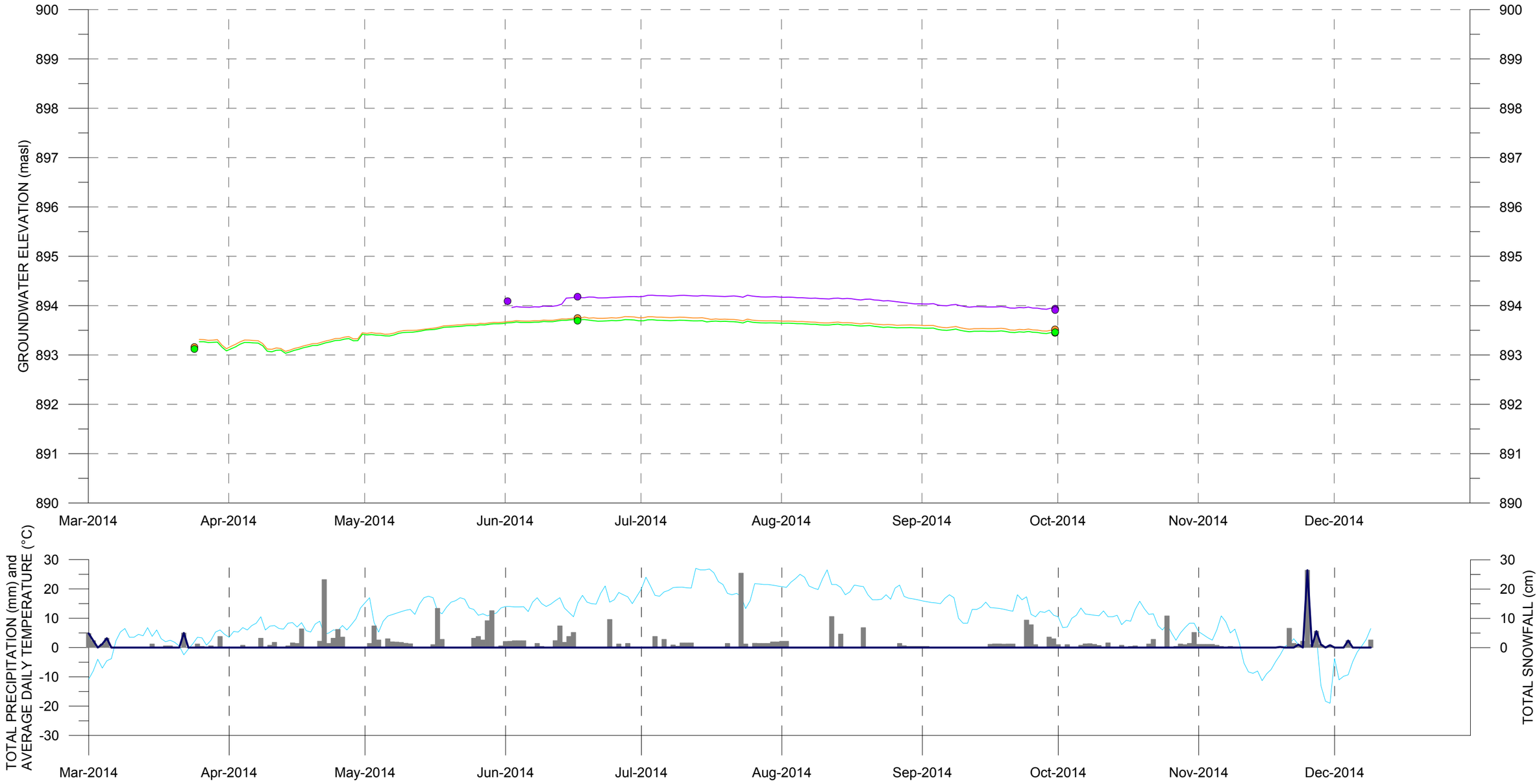
GENERAL MONITORING LOCATION

TSF

NOTES:
1) WELL LOCATIONS SHOWN ON DRAWING 03; WELL COMPLETION DETAILS SUMMARIZED IN TABLE 1.
2) BOREHOLE LOGS INCLUDED IN APPENDIX A.
3) CLIMATE DATA FROM ENVIRONMENT CANADA, KAMLOOPS AIRPORT AND KAMLOOPS PRATT ROAD STATION (2014).
4) HSU = HYDROSTRATIGRAPHIC UNIT; VWP = VIBRATING WIRE PIEZOMETER; TSF = TAILINGS STORAGE FACILITY; EMRSF = EAST MINE ROCK STORAGE FACILITY; SMRSF = SOUTH MINE ROCK STORAGE FACILITY.

SCALE: AS SHOWN	DRAWN: CK	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY	PROJECT: AJAX PROJECT ENVIRONMENTAL ASSESSMENT BASELINE GROUNDWATER HYDROLOGY ASSESSMENT
DATE: AUG 2015	CHECKED: CK	KGHM AJAX MINING INC.	TITLE: BGC14-002 GROUNDWATER ELEVATION TIME SERIES WITH METEOROLOGICAL DATA
PROJECT No.: 1125007-03	APPROVED: BM		FIG No.: G-2

C:\Exports\02_TSF_PIEZ_BGC14-002.grf



MONITORING INTERVAL DETAILS

	SCREEN INT. (M ASL)	COLLAR EL. (M ASL)	HSU
BGC14-003D	865 TO 868	897	NICOLA GROUP
BGC14-003I	877 TO 880	897	FLUVIAL / GLACIOFLUVIAL
BGC14-003S	886 TO 887	897	GLACIAL TILL

CLIMATE DATA

- Total Precipitation (mm)
- Total Snowfall (cm)
- Average Daily Temperature (°C)

WATER LEVEL DATA

- BGC14-003D
- BGC14-003I
- BGC14-003S
- DATALOGGER
- MANUAL MEASUREMENT

GENERAL MONITORING LOCATION

TSF

NOTES:
1) WELL LOCATIONS SHOWN ON DRAWING 03; WELL COMPLETION DETAILS SUMMARIZED IN TABLE 1.
2) BOREHOLE LOGS INCLUDED IN APPENDIX A.
3) CLIMATE DATA FROM ENVIRONMENT CANADA, KAMLOOPS AIRPORT AND KAMLOOPS PRATT ROAD STATION (2014).
4) HSU = HYDROSTRATIGRAPHIC UNIT; VWP = VIBRATING WIRE PIEZOMETER; TSF = TAILINGS STORAGE FACILITY; EMRSF = EAST MINE ROCK STORAGE FACILITY; SMRSF = SOUTH MINE ROCK STORAGE FACILITY.

SCALE: AS SHOWN	DRAWN: CK	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY	PROJECT: AJAX PROJECT ENVIRONMENTAL ASSESSMENT BASELINE GROUNDWATER HYDROLOGY ASSESSMENT
DATE: AUG 2015	CHECKED: CK	KGHM AJAX MINING INC.	TITLE: BGC14-003 GROUNDWATER ELEVATION TIME SERIES WITH METEOROLOGICAL DATA
PROJECT No.: 1125007-03	APPROVED: BM		FIG No.: G-3

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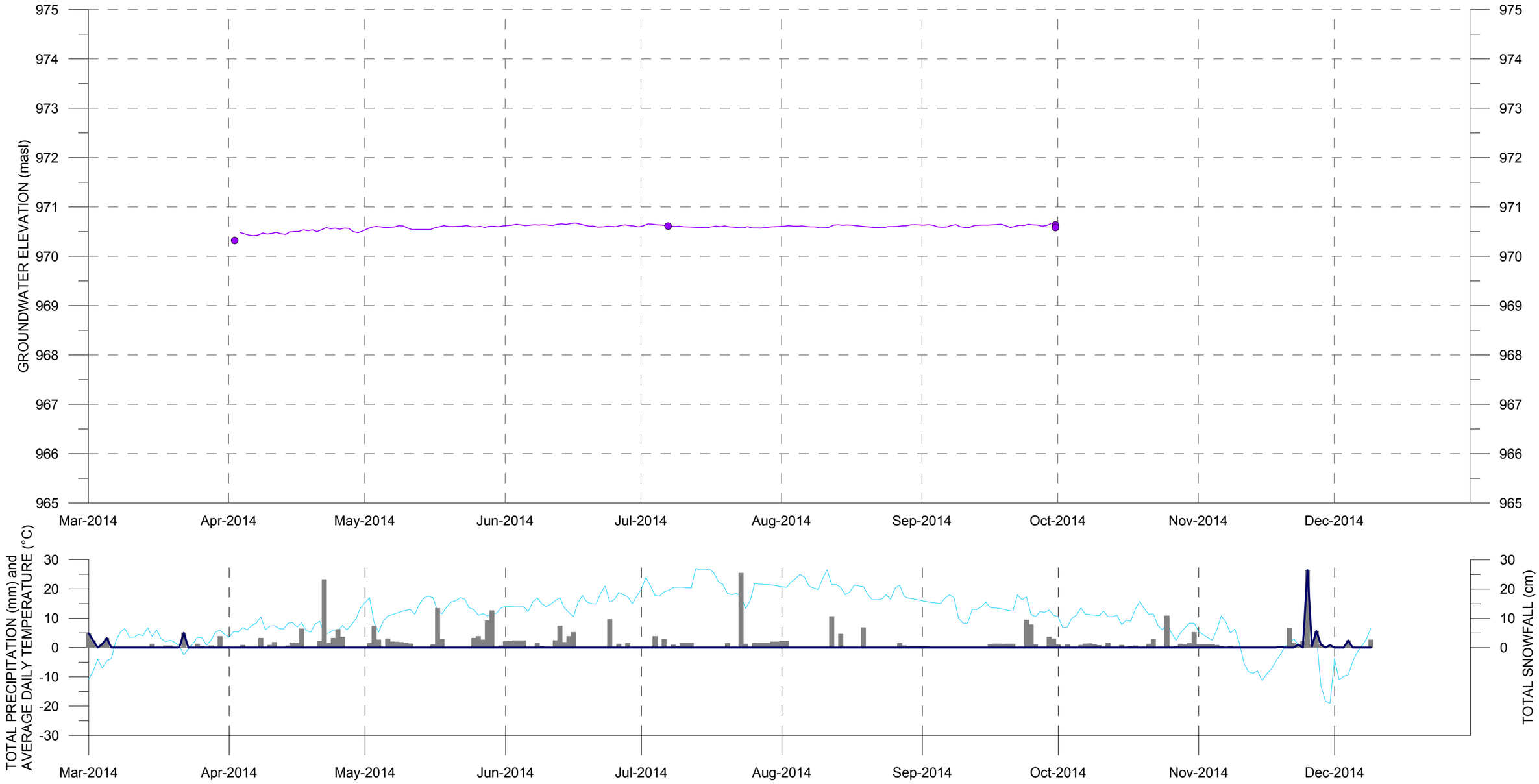

MONITORING INTERVAL DETAILS

	SCREEN INT. (M ASL)	COLLAR EL. (M ASL)	HSU
BGC14-010	921 TO 933	979	NICOLA GROUP

CLIMATE DATA

- Total Precipitation (mm)
- Total Snowfall (cm)
- Average Daily Temperature (°C)

WATER LEVEL DATA

- BGC14-010
- MANUAL MEASUREMENT
- DATALOGGER

GENERAL MONITORING LOCATION

TSF

NOTES:
1) WELL LOCATIONS SHOWN ON DRAWING 03; WELL COMPLETION DETAILS SUMMARIZED IN TABLE 1.
2) BOREHOLE LOGS INCLUDED IN APPENDIX A.
3) CLIMATE DATA FROM ENVIRONMENT CANADA, KAMLOOPS AIRPORT AND KAMLOOPS PRATT ROAD STATION (2014).
4) HSU = HYDROSTRATIGRAPHIC UNIT; VWP = VIBRATING WIRE PIEZOMETER; TSF = TAILINGS STORAGE FACILITY; EMRSF = EAST MINE ROCK STORAGE FACILITY; SMRSF = SOUTH MINE ROCK STORAGE FACILITY.

SCALE: AS SHOWN	DRAWN: CK	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY	PROJECT: AJAX PROJECT ENVIRONMENTAL ASSESSMENT BASELINE GROUNDWATER HYDROLOGY ASSESSMENT
DATE: AUG 2015	CHECKED: CK	KGHM AJAX MINING INC.	TITLE: BGC14-010 GROUNDWATER ELEVATION TIME SERIES WITH METEOROLOGICAL DATA
PROJECT No.: 1125007-03	APPROVED: BM		FIG No.: G-4

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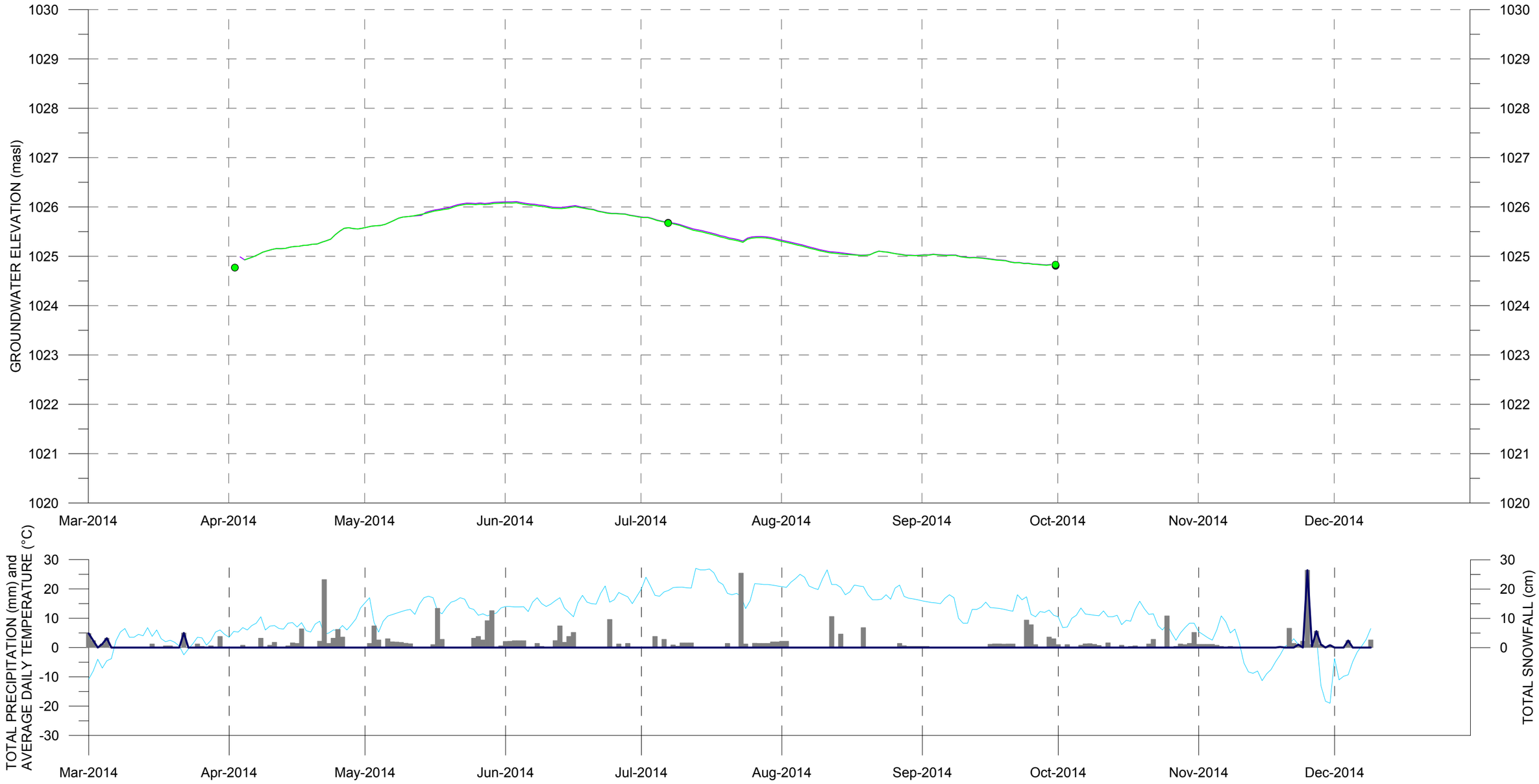

MONITORING INTERVAL DETAILS

	SCREEN INT. (M ASL)	COLLAR EL. (M ASL)	HSU
BGC14-011D	1000 TO 1006	1029	NICOLA GROUP
BGC14-011S	1011 TO 1014	1029	NICOLA GROUP

CLIMATE DATA

- Total Precipitation (mm)
- Total Snowfall (cm)
- Average Daily Temperature (°C)

WATER LEVEL DATA

- BGC14-011D — DATALOGGER
- BGC14-011S • MANUAL MEASUREMENT

GENERAL MONITORING LOCATION

TSF

NOTES:
1) WELL LOCATIONS SHOWN ON DRAWING 03; WELL COMPLETION DETAILS SUMMARIZED IN TABLE 1.
2) BOREHOLE LOGS INCLUDED IN APPENDIX A.
3) CLIMATE DATA FROM ENVIRONMENT CANADA, KAMLOOPS AIRPORT AND KAMLOOPS PRATT ROAD STATION (2014).
4) HSU = HYDROSTRATIGRAPHIC UNIT; VWP = VIBRATING WIRE PIEZOMETER; TSF = TAILINGS STORAGE FACILITY; EMRSF = EAST MINE ROCK STORAGE FACILITY; SMRSF = SOUTH MINE ROCK STORAGE FACILITY.

SCALE: AS SHOWN	DRAWN: CK	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY	PROJECT: AJAX PROJECT ENVIRONMENTAL ASSESSMENT BASELINE GROUNDWATER HYDROLOGY ASSESSMENT
DATE: AUG 2015	CHECKED: CK	KGHM AJAX MINING INC.	TITLE: BGC14-011 GROUNDWATER ELEVATION TIME SERIES WITH METEOROLOGICAL DATA
PROJECT No.: 1125007-03	APPROVED: BM		FIG No.: G-5

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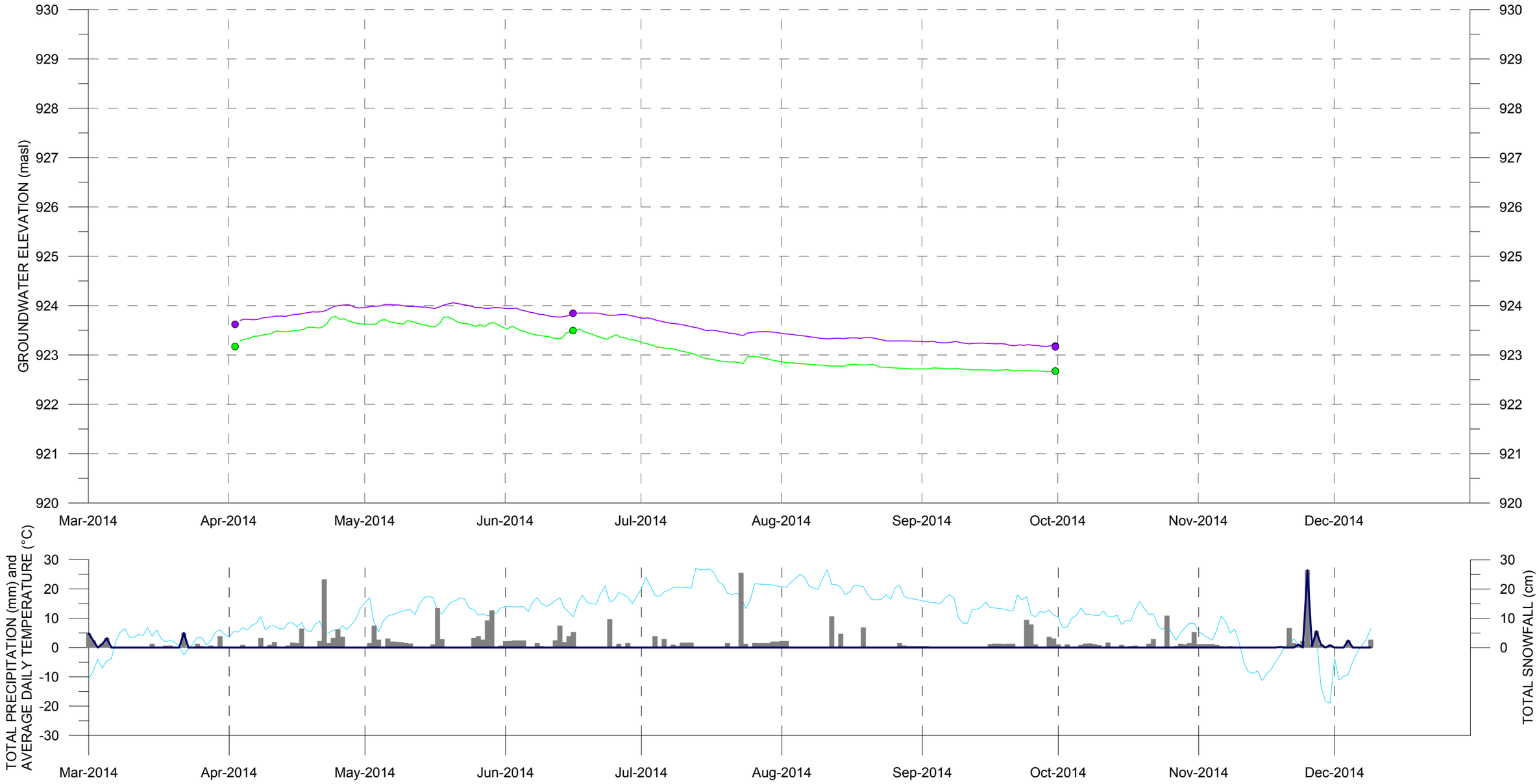

MONITORING INTERVAL DETAILS

	SCREEN INT. (M ASL)	COLLAR EL. (M ASL)	HSU
BGC14-012D	898 TO 904	924	NICOLA GROUP
BGC14-012S	920.6 TO 921.2	924	COLLUVIUM

CLIMATE DATA

- Total Precipitation (mm)
- Total Snowfall (cm)
- Average Daily Temperature (°C)

WATER LEVEL DATA

- BGC14-012D — DATALOGGER
- BGC14-012S ● MANUAL MEASUREMENT

GENERAL MONITORING LOCATION

TSF

NOTES:
1) WELL LOCATIONS SHOWN ON DRAWING 03; WELL COMPLETION DETAILS SUMMARIZED IN TABLE 1.
2) BOREHOLE LOGS INCLUDED IN APPENDIX A.
3) CLIMATE DATA FROM ENVIRONMENT CANADA, KAMLOOPS AIRPORT AND KAMLOOPS PRATT ROAD STATION (2014).
4) HSU = HYDROSTRATIGRAPHIC UNIT; VWP = VIBRATING WIRE PIEZOMETER; TSF = TAILINGS STORAGE FACILITY; EMRSF = EAST MINE ROCK STORAGE FACILITY; SMRSF = SOUTH MINE ROCK STORAGE FACILITY.

SCALE: AS SHOWN	DRAWN: CK	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY	PROJECT: AJAX PROJECT ENVIRONMENTAL ASSESSMENT BASELINE GROUNDWATER HYDROLOGY ASSESSMENT
DATE: AUG 2015	CHECKED: CK	KGHM AJAX MINING INC.	TITLE: BGC14-012 GROUNDWATER ELEVATION TIME SERIES WITH METEOROLOGICAL DATA
PROJECT No.: 1125007-03	APPROVED: BM		FIG No.: G-6

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MONITORING INTERVAL DETAILS

	SCREEN INT. (M ASL)	COLLAR EL. (M ASL)	HSU
BGC14-016	1009 TO 1015	1039	NICOLA GROUP

CLIMATE DATA

- Total Precipitation (mm)
- Total Snowfall (cm)
- Average Daily Temperature (°C)

WATER LEVEL DATA

- BGC14-016
- MANUAL MEASUREMENT
- DATALOGGER

GENERAL MONITORING LOCATION

TSF

NOTES:
1) WELL LOCATIONS SHOWN ON DRAWING 03; WELL COMPLETION DETAILS SUMMARIZED IN TABLE 1.
2) BOREHOLE LOGS INCLUDED IN APPENDIX A.
3) CLIMATE DATA FROM ENVIRONMENT CANADA, KAMLOOPS AIRPORT AND KAMLOOPS PRATT ROAD STATION (2014).
4) HSU = HYDROSTRATIGRAPHIC UNIT; VWP = VIBRATING WIRE PIEZOMETER; TSF = TAILINGS STORAGE FACILITY; EMRSF = EAST MINE ROCK STORAGE FACILITY; SMRSF = SOUTH MINE ROCK STORAGE FACILITY.

SCALE: AS SHOWN	DRAWN: CK	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY	PROJECT: AJAX PROJECT ENVIRONMENTAL ASSESSMENT BASELINE GROUNDWATER HYDROLOGY ASSESSMENT
DATE: AUG 2015	CHECKED: CK	KGHM AJAX MINING INC.	TITLE: BGC14-016 GROUNDWATER ELEVATION TIME SERIES WITH METEOROLOGICAL DATA
PROJECT No.: 1125007-03	APPROVED: BM		FIG No.: G-7

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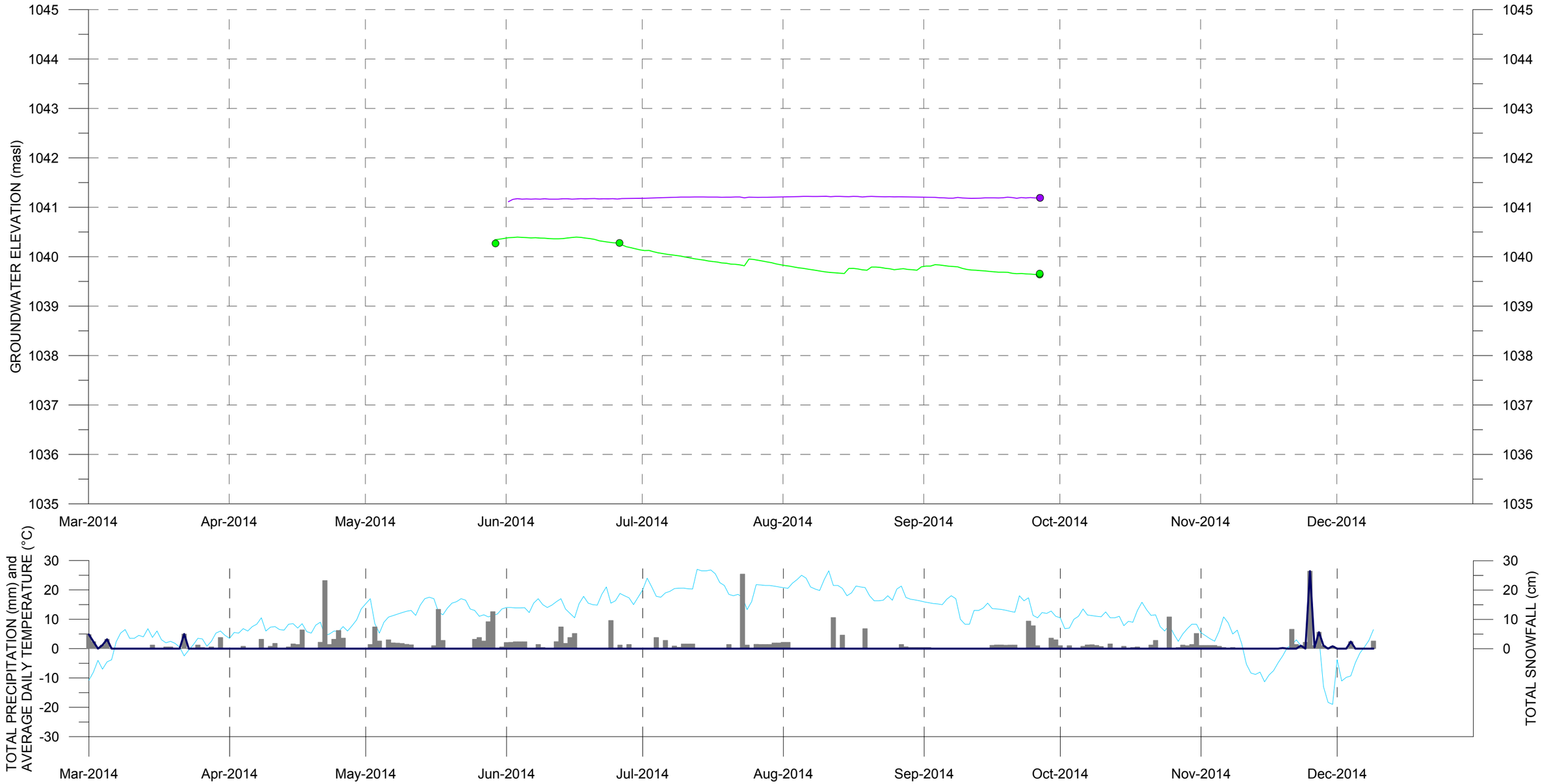

MONITORING INTERVAL DETAILS

	SCREEN INT. (M ASL)	COLLAR EL. (M ASL)	HSU
BGC14-017D	1011 TO 1017	1040	NICOLA GROUP
BGC14-017S	1036 TO 1037	1040	GLACIAL TILL

CLIMATE DATA

- Total Precipitation (mm)
- Total Snowfall (cm)
- Average Daily Temperature (°C)

WATER LEVEL DATA

- BGC14-017D — DATALOGGER
- BGC14-017S • MANUAL MEASUREMENT

GENERAL MONITORING LOCATION

TSF

NOTES:
1) WELL LOCATIONS SHOWN ON DRAWING 03; WELL COMPLETION DETAILS SUMMARIZED IN TABLE 1.
2) BOREHOLE LOGS INCLUDED IN APPENDIX A.
3) CLIMATE DATA FROM ENVIRONMENT CANADA, KAMLOOPS AIRPORT AND KAMLOOPS PRATT ROAD STATION (2014).
4) HSU = HYDROSTRATIGRAPHIC UNIT; VWP = VIBRATING WIRE PIEZOMETER; TSF = TAILINGS STORAGE FACILITY; EMRSF = EAST MINE ROCK STORAGE FACILITY; SMRSF = SOUTH MINE ROCK STORAGE FACILITY.

SCALE: AS SHOWN	DRAWN: CK	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY	PROJECT: AJAX PROJECT ENVIRONMENTAL ASSESSMENT BASELINE GROUNDWATER HYDROLOGY ASSESSMENT
DATE: AUG 2015	CHECKED: CK	KGHM AJAX MINING INC.	TITLE: BGC14-017 GROUNDWATER ELEVATION TIME SERIES WITH METEOROLOGICAL DATA
PROJECT No.: 1125007-03	APPROVED: BM		FIG No.: G-8

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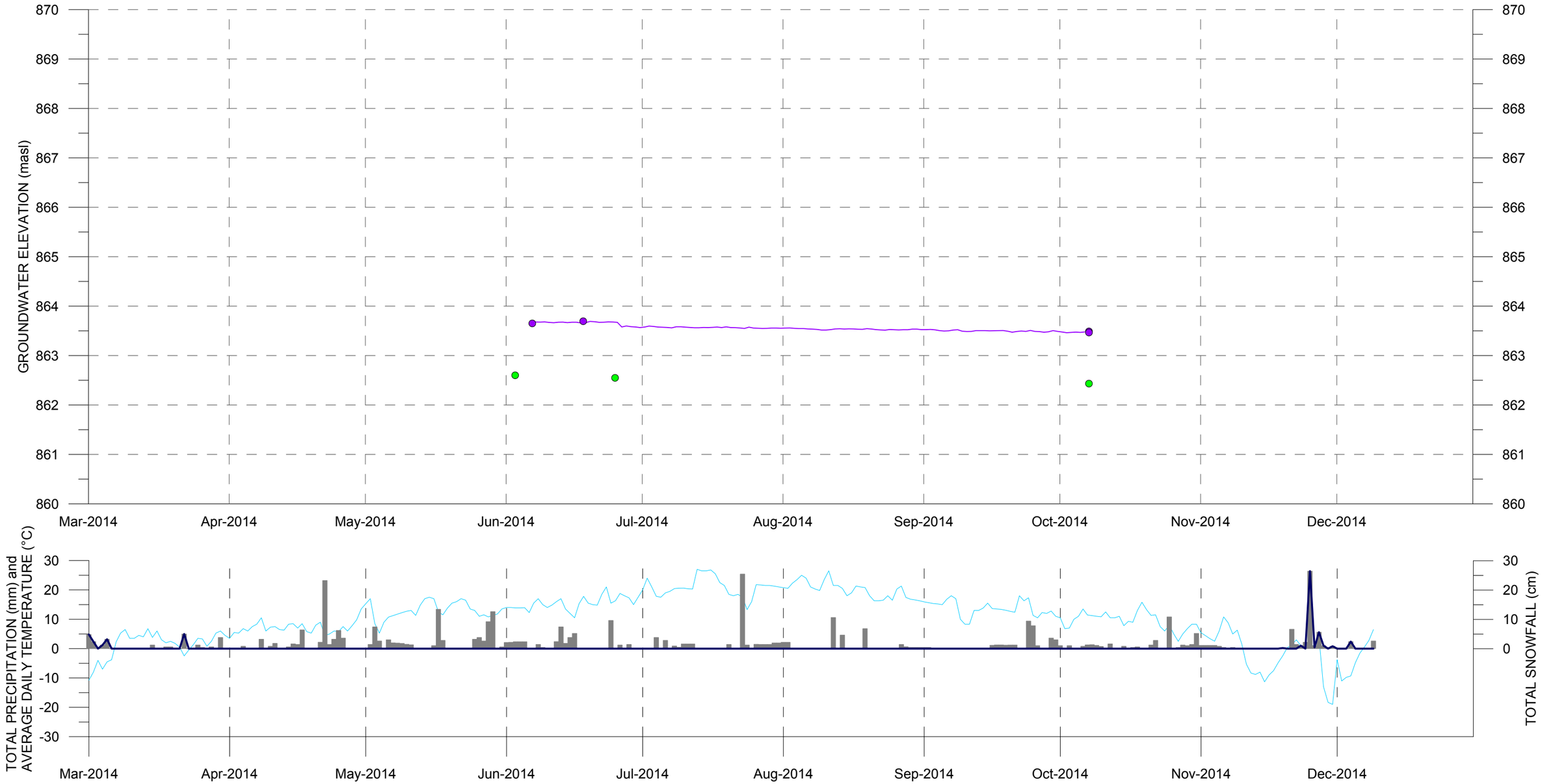


MONITORING INTERVAL DETAILS

	SCREEN INT. (M ASL)	COLLAR EL. (M ASL)	HSU
BGC13-021	862 TO 865	874	FLUVIAL / GLACIOFLUVIAL
BGC14-004	793 TO 799	871	IRON MASK HYBRID

CLIMATE DATA

- Total Precipitation (mm)
- Total Snowfall (cm)
- Average Daily Temperature (°C)

WATER LEVEL DATA

- BGC14-004 — DATALOGGER
- BGC13-021 — MANUAL MEASUREMENT

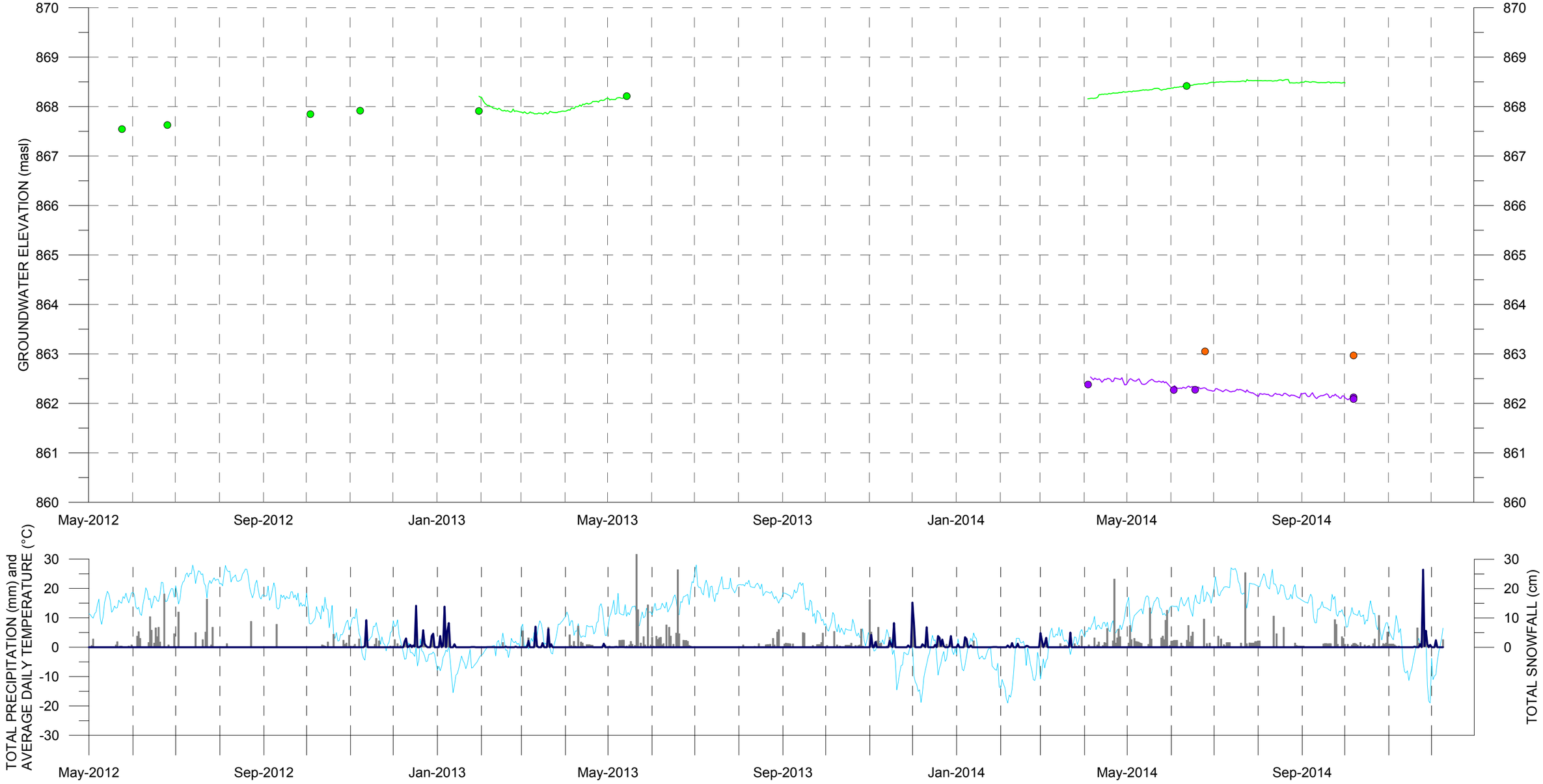
GENERAL MONITORING LOCATION

EMRSF

NOTES:
1) WELL LOCATIONS SHOWN ON DRAWING 03; WELL COMPLETION DETAILS SUMMARIZED IN TABLE 1.
2) BOREHOLE LOGS INCLUDED IN APPENDIX A.
3) CLIMATE DATA FROM ENVIRONMENT CANADA, KAMLOOPS AIRPORT AND KAMLOOPS PRATT ROAD STATION (2014).
4) HSU = HYDROSTRATIGRAPHIC UNIT; VWP = VIBRATING WIRE PIEZOMETER; TSF = TAILINGS STORAGE FACILITY; EMRSF = EAST MINE ROCK STORAGE FACILITY; SMRSF = SOUTH MINE ROCK STORAGE FACILITY.

SCALE: AS SHOWN	DRAWN: CK	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY	PROJECT: AJAX PROJECT ENVIRONMENTAL ASSESSMENT BASELINE GROUNDWATER HYDROLOGY ASSESSMENT
DATE: AUG 2015	CHECKED: CK	KGHM AJAX MINING INC.	TITLE: BGC14-004 and BGC13-021 GROUNDWATER ELEVATION TIME SERIES WITH METEOROLOGICAL DATA
PROJECT No.: 1125007-03	APPROVED: BM		FIG No.: G-9

C:\Exports\09_EMRSF_PIEZ_BGC14-004_and_BGC13_021.grf



MONITORING INTERVAL DETAILS

	SCREEN INT. (M ASL)	COLLAR EL. (M ASL)	HSU
DH-BGC11-ED-14	862 TO 865	890	FLUVIAL / GLACIOFLUVIAL
BGC13-022	861 TO 864	878	GLACIAL TILL
BGC14-005	827 TO 830	878	IRON MASK HYBRID

CLIMATE DATA

- Total Precipitation (mm)
- Total Snowfall (cm)
- Average Daily Temperature (°C)

WATER LEVEL DATA

- DH-BGC11-ED-14
- BGC13-022
- BGC14-005
- DATALOGGER
- MANUAL MEASUREMENT

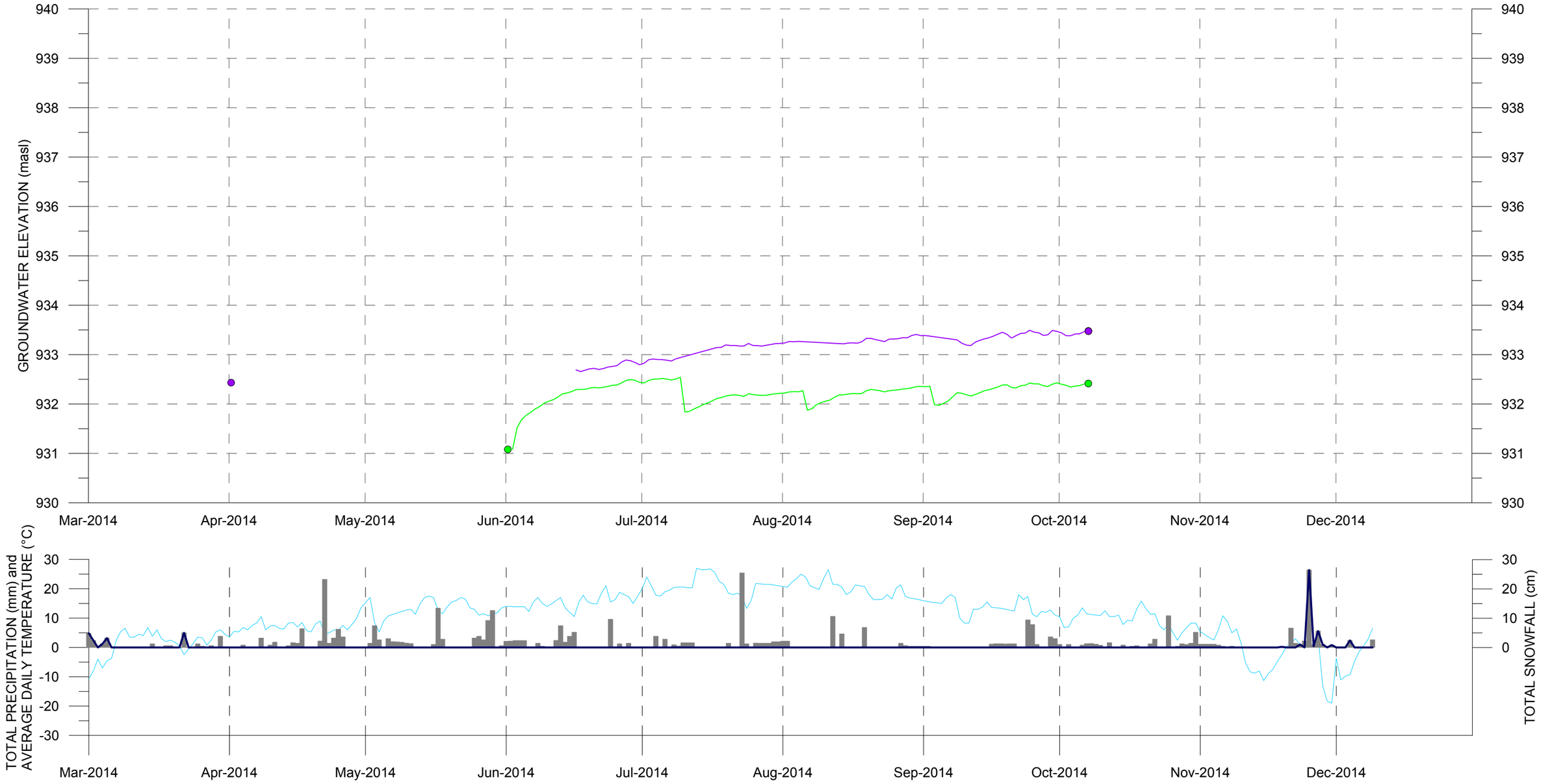
GENERAL MONITORING LOCATION

EMRSF

NOTES:
1) WELL LOCATIONS SHOWN ON DRAWING 03; WELL COMPLETION DETAILS SUMMARIZED IN TABLE 1.
2) BOREHOLE LOGS INCLUDED IN APPENDIX A.
3) CLIMATE DATA FROM ENVIRONMENT CANADA, KAMLOOPS AIRPORT AND KAMLOOPS PRATT ROAD STATION (2014).
4) HSU = HYDROSTRATIGRAPHIC UNIT; VWP = VIBRATING WIRE PIEZOMETER; TSF = TAILINGS STORAGE FACILITY; EMRSF = EAST MINE ROCK STORAGE FACILITY; SMRSF = SOUTH MINE ROCK STORAGE FACILITY.

SCALE: AS SHOWN	DRAWN: CK	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY	PROJECT: AJAX PROJECT ENVIRONMENTAL ASSESSMENT BASELINE GROUNDWATER HYDROLOGY ASSESSMENT
DATE: AUG 2015	CHECKED: CK	KGHM AJAX MINING INC.	TITLE: BGC14-005, BGC13-022 and DH-BGC11-ED-14 GROUNDWATER ELEVATION TIME SERIES WITH METEOROLOGICAL DATA
PROJECT No.: 1125007-03	APPROVED: BM		FIG No.: G-10

C:\Exports\10_EMRSF_PIEZ_BGC14-005_BGC13_022_and_ED14.grf



MONITORING INTERVAL DETAILS

	SCREEN INT. (M ASL)	COLLAR EL. (M ASL)	HSU
BGC14-006D	914 TO 920	940	IRON MASK HYBRID
BGC14-006S	926 TO 929	940	GLACIAL TILL

CLIMATE DATA

- Total Precipitation (mm)
- Total Snowfall (cm)
- Average Daily Temperature (°C)

WATER LEVEL DATA

- BGC14-006D — DATALOGGER
- BGC14-006S • MANUAL MEASUREMENT

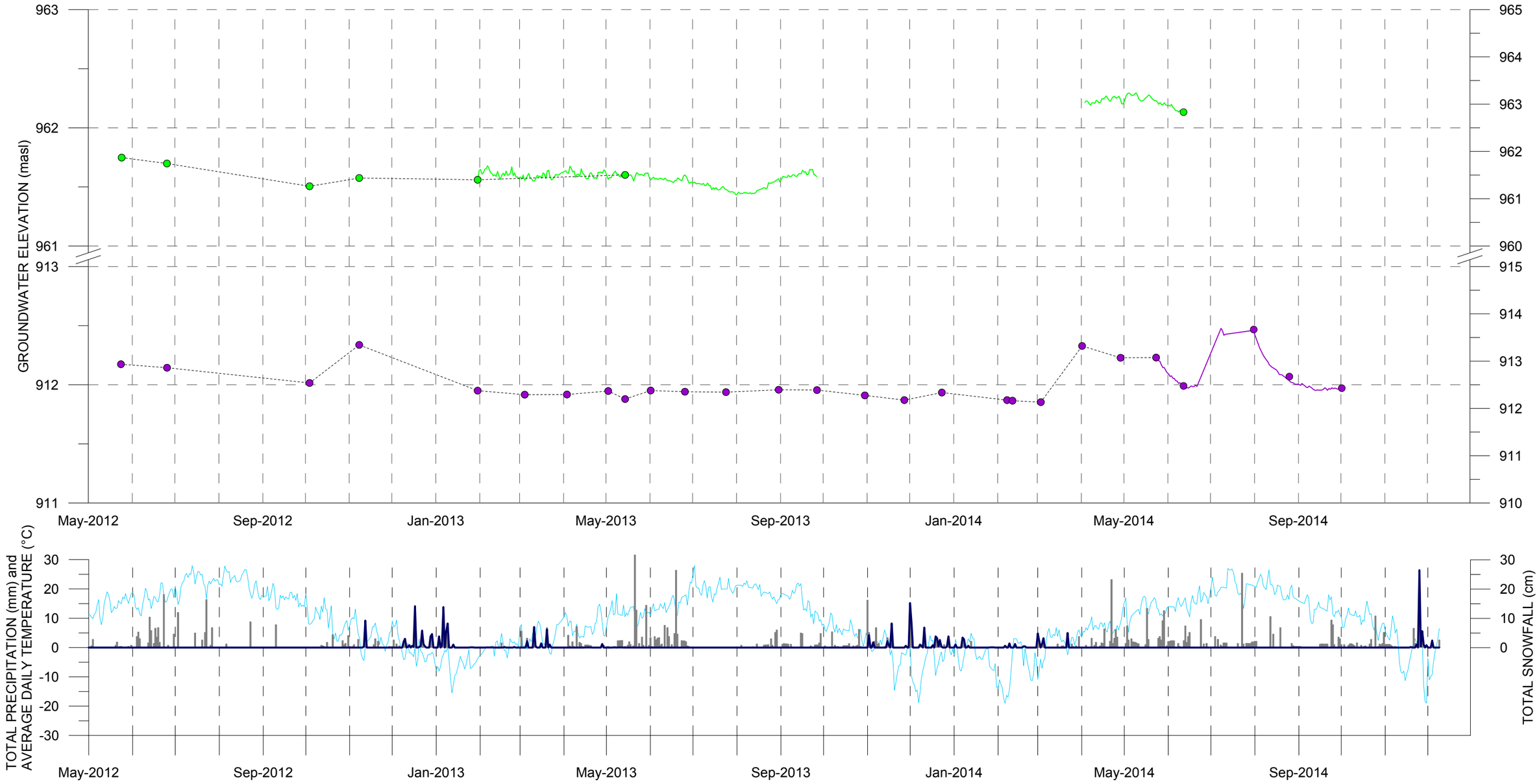
GENERAL MONITORING LOCATION

EMRSF

NOTES:
1) WELL LOCATIONS SHOWN ON DRAWING 03; WELL COMPLETION DETAILS SUMMARIZED IN TABLE 1.
2) BOREHOLE LOGS INCLUDED IN APPENDIX A.
3) CLIMATE DATA FROM ENVIRONMENT CANADA, KAMLOOPS AIRPORT AND KAMLOOPS PRATT ROAD STATION (2014).
4) HSU = HYDROSTRATIGRAPHIC UNIT; VWP = VIBRATING WIRE PIEZOMETER; TSF = TAILINGS STORAGE FACILITY; EMRSF = EAST MINE ROCK STORAGE FACILITY; SMRSF = SOUTH MINE ROCK STORAGE FACILITY.

SCALE: AS SHOWN	DRAWN: CK	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY	PROJECT: AJAX PROJECT ENVIRONMENTAL ASSESSMENT BASELINE GROUNDWATER HYDROLOGY ASSESSMENT
DATE: AUG 2015	CHECKED: CK	KGHM AJAX MINING INC.	TITLE: BGC14-006 GROUNDWATER ELEVATION TIME SERIES WITH METEOROLOGICAL DATA
PROJECT No.: 1125007-03	APPROVED: BM		FIG No.: G-11

C:\Exports\11_EMRSF_PIEZ_BGC14-006.grf



MONITORING INTERVAL DETAILS

	SCREEN INT. (M ASL)	COLLAR EL. (M ASL)	HSU
DH-BGC11-ED-11	905 TO 908	937	GLACIAL TILL
DH-BGC11-ED-15	955 TO 958	964	GLACIAL TILL

CLIMATE DATA

- Total Precipitation (mm)
- Total Snowfall (cm)
- Average Daily Temperature (°C)

WATER LEVEL DATA

- DH-BGC11-ED-11
- DH-BGC11-ED-15
- DATALOGGER
- MANUAL MEASUREMENT

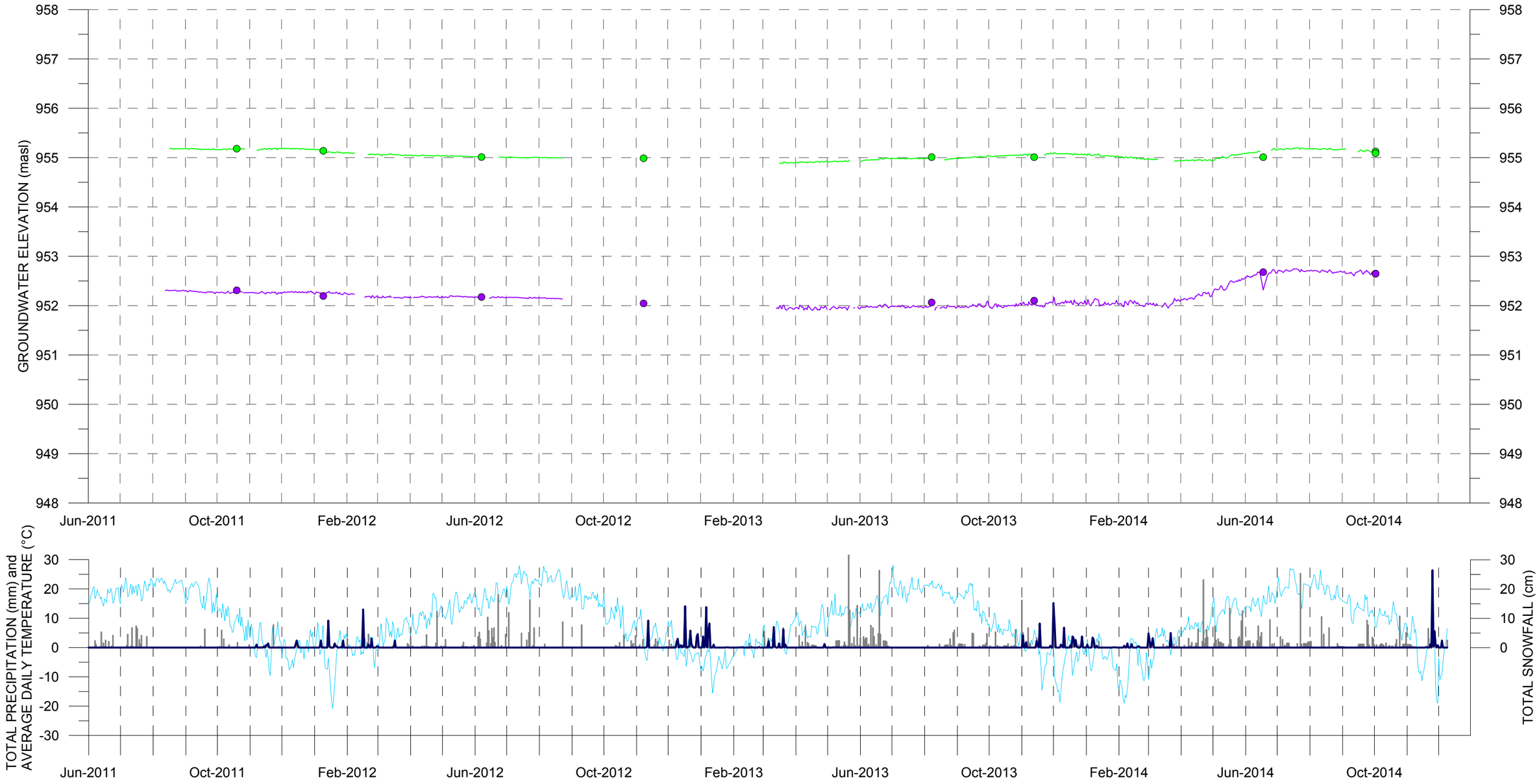
GENERAL MONITORING LOCATION

EMRSF

NOTES:
1) WELL LOCATIONS SHOWN ON DRAWING 03; WELL COMPLETION DETAILS SUMMARIZED IN TABLE 1.
2) BOREHOLE LOGS INCLUDED IN APPENDIX A.
3) CLIMATE DATA FROM ENVIRONMENT CANADA, KAMLOOPS AIRPORT AND KAMLOOPS PRATT ROAD STATION (2014).
4) HSU = HYDROSTRATIGRAPHIC UNIT; VWP = VIBRATING WIRE PIEZOMETER; TSF = TAILINGS STORAGE FACILITY; EMRSF = EAST MINE ROCK STORAGE FACILITY; SMRSF = SOUTH MINE ROCK STORAGE FACILITY.

SCALE: AS SHOWN	DRAWN: CK	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY	PROJECT: AJAX PROJECT ENVIRONMENTAL ASSESSMENT BASELINE GROUNDWATER HYDROLOGY ASSESSMENT
DATE: AUG 2015	CHECKED: CK	KGHM AJAX MINING INC.	TITLE: DH-BGC11-ED-11 and 15 GROUNDWATER ELEVATION TIME SERIES WITH METEOROLOGICAL DATA
PROJECT No.: 1125007-03	APPROVED: BM		FIG No.: G-12

C:\Exports\12_EMRSF_PIEZ_DH-BGC11-ED-series.grf



MONITORING INTERVAL DETAILS

	SCREEN INT. (M ASL)	COLLAR EL. (M ASL)	HSU
MW11-05D	932 TO 935	961	IRON MASK HYBRID
MW11-05S	947 TO 948	961	IRON MASK HYBRID

CLIMATE DATA

- Total Precipitation (mm)
- Total Snowfall (cm)
- Average Daily Temperature (°C)

WATER LEVEL DATA

- MW11-05D — DATALOGGER
- MW11-05S • MANUAL MEASUREMENT

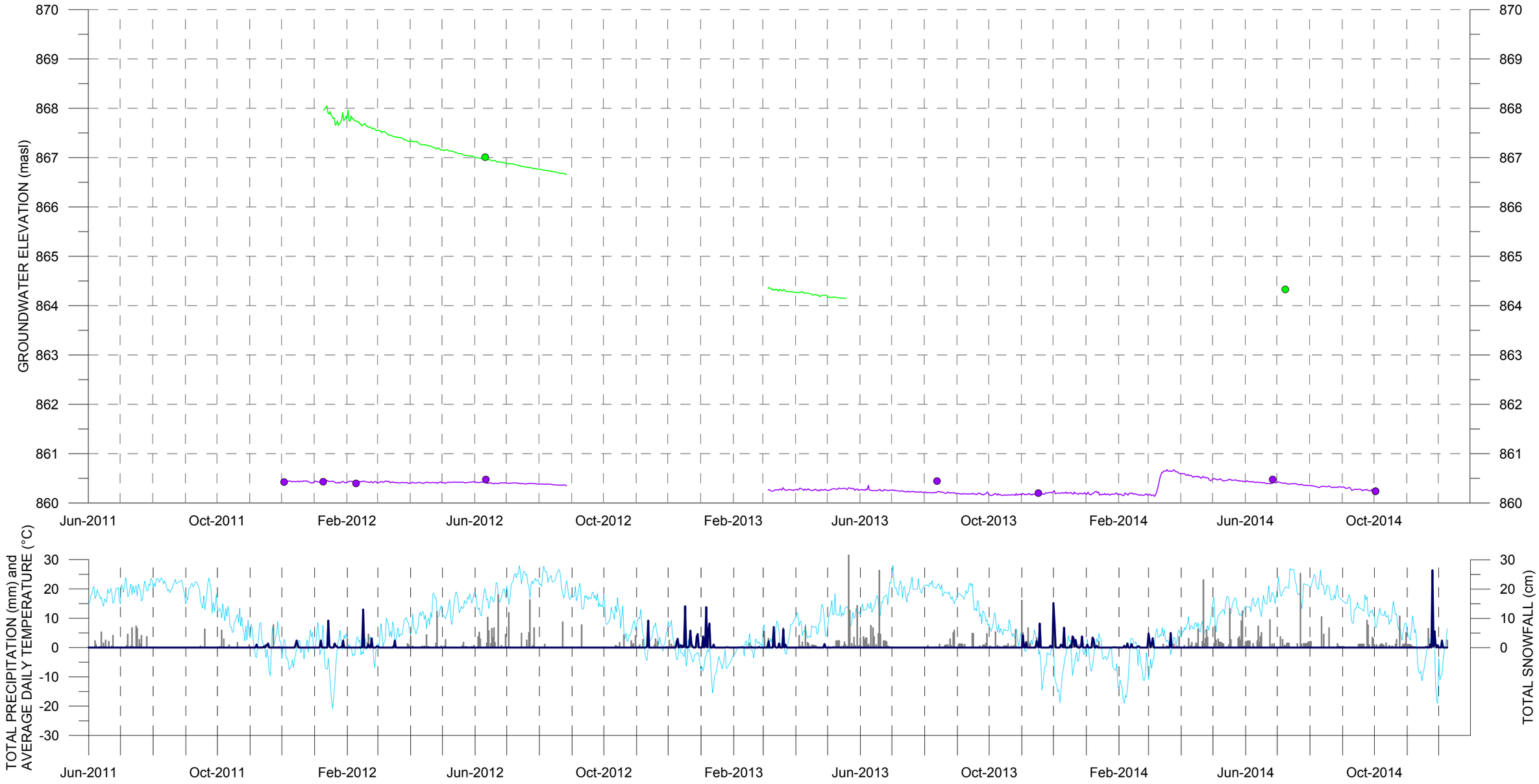
GENERAL MONITORING LOCATION

EMRSF

NOTES:
1) WELL LOCATIONS SHOWN ON DRAWING 03; WELL COMPLETION DETAILS SUMMARIZED IN TABLE 1.
2) BOREHOLE LOGS INCLUDED IN APPENDIX A.
3) CLIMATE DATA FROM ENVIRONMENT CANADA, KAMLOOPS AIRPORT AND KAMLOOPS PRATT ROAD STATION (2014).
4) HSU = HYDROSTRATIGRAPHIC UNIT; VWP = VIBRATING WIRE PIEZOMETER; TSF = TAILINGS STORAGE FACILITY; EMRSF = EAST MINE ROCK STORAGE FACILITY; SMRSF = SOUTH MINE ROCK STORAGE FACILITY.

SCALE: AS SHOWN	DRAWN: CK	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY	PROJECT: AJAX PROJECT ENVIRONMENTAL ASSESSMENT BASELINE GROUNDWATER HYDROLOGY ASSESSMENT
DATE: AUG 2015	CHECKED: CK	KGHM AJAX MINING INC.	TITLE: MW11-05 GROUNDWATER ELEVATION TIME SERIES WITH METEOROLOGICAL DATA
PROJECT No.: 1125007-03	APPROVED: BM		FIG No.: G-13

C:\Exports\13_EMRSF_PIEZ_MW11-05.grf



MONITORING INTERVAL DETAILS

	SCREEN INT. (M ASL)	COLLAR EL. (M ASL)	HSU
MW11-10D	808 TO 811	887	FLUVIAL / GLACIOFLUVIAL
MW11-10S	864 TO 867	887	FLUVIAL / GLACIOFLUVIAL

CLIMATE DATA

- Total Precipitation (mm)
- Total Snowfall (cm)
- Average Daily Temperature (°C)

WATER LEVEL DATA

- MW11-10D — DATALOGGER
- MW11-10S • MANUAL MEASUREMENT

GENERAL MONITORING LOCATION

EMRSF

NOTES:
1) WELL LOCATIONS SHOWN ON DRAWING 03; WELL COMPLETION DETAILS SUMMARIZED IN TABLE 1.
2) BOREHOLE LOGS INCLUDED IN APPENDIX A.
3) CLIMATE DATA FROM ENVIRONMENT CANADA, KAMLOOPS AIRPORT AND KAMLOOPS PRATT ROAD STATION (2014).
4) HSU = HYDROSTRATIGRAPHIC UNIT; VWP = VIBRATING WIRE PIEZOMETER; TSF = TAILINGS STORAGE FACILITY; EMRSF = EAST MINE ROCK STORAGE FACILITY; SMRSF = SOUTH MINE ROCK STORAGE FACILITY.

SCALE: AS SHOWN	DRAWN: CK	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY	PROJECT: AJAX PROJECT ENVIRONMENTAL ASSESSMENT BASELINE GROUNDWATER HYDROLOGY ASSESSMENT
DATE: AUG 2015	CHECKED: CK	KGHM AJAX MINING INC.	TITLE: MW11-10 GROUNDWATER ELEVATION TIME SERIES WITH METEOROLOGICAL DATA
PROJECT No.: 1125007-03	APPROVED: BM		FIG No.: G-14

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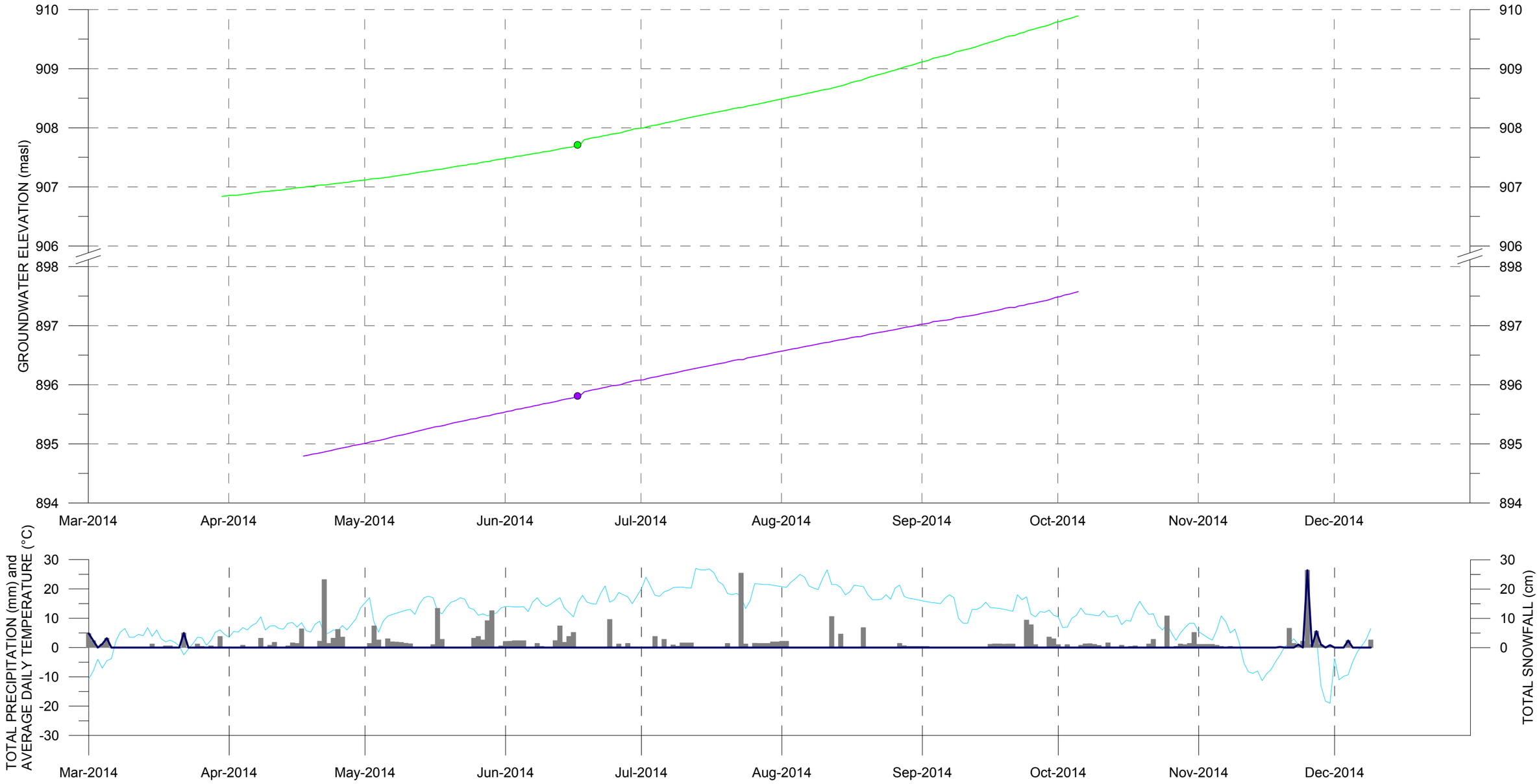


MONITORING INTERVAL DETAILS

	SCREEN INT. (M ASL)	COLLAR EL. (M ASL)	HSU
BGC14-007D	895 TO 898	924	NICOLA GROUP
BGC14-007S	907 TO 910	924	GLACIAL TILL

CLIMATE DATA

- Total Precipitation (mm)
- Total Snowfall (cm)
- Average Daily Temperature (°C)

WATER LEVEL DATA

- BGC14-007D — DATALOGGER
- BGC14-007S ● MANUAL MEASUREMENT

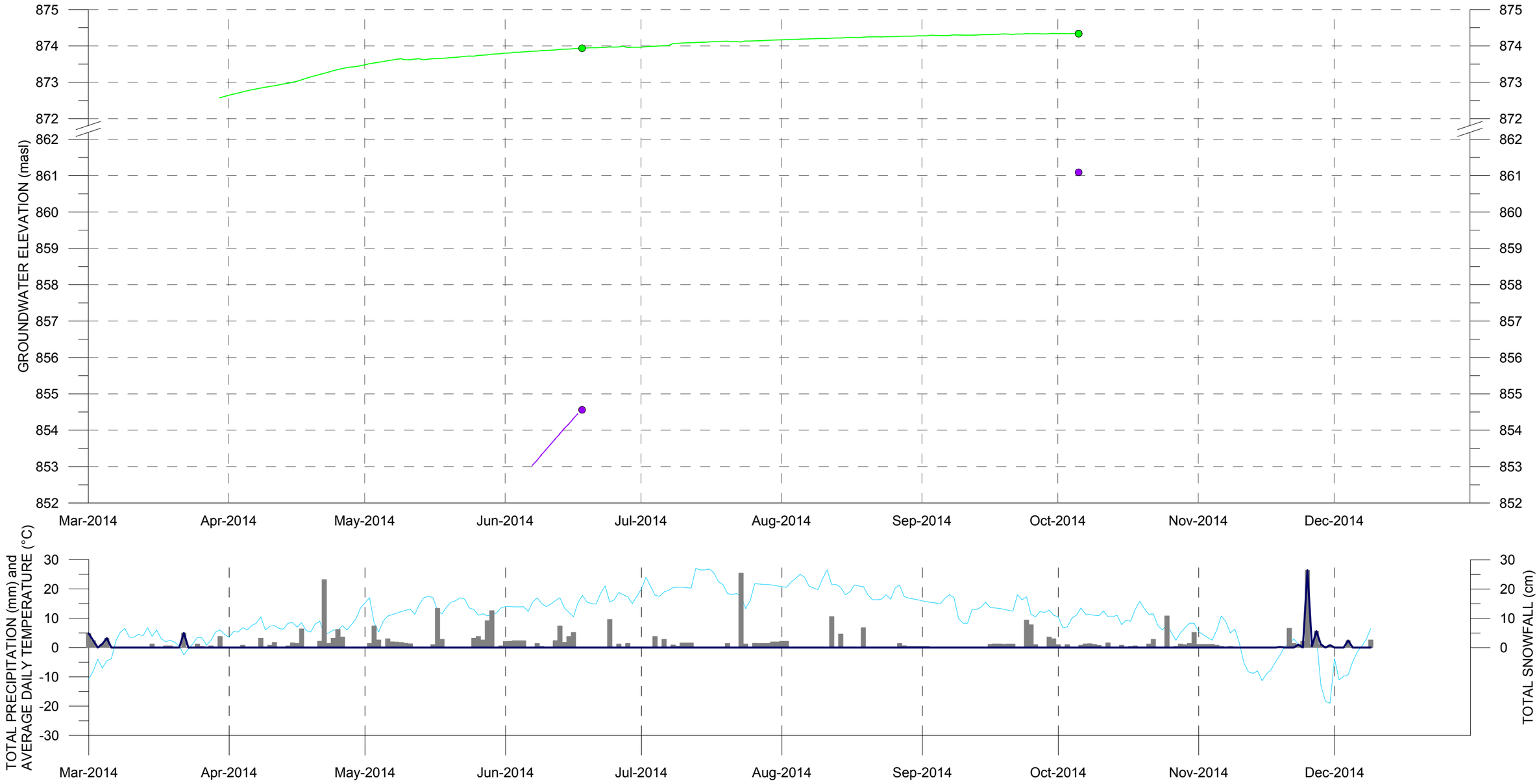
GENERAL MONITORING LOCATION

SMRSF

NOTES:
1) WELL LOCATIONS SHOWN ON DRAWING 03; WELL COMPLETION DETAILS SUMMARIZED IN TABLE 1.
2) BOREHOLE LOGS INCLUDED IN APPENDIX A.
3) CLIMATE DATA FROM ENVIRONMENT CANADA, KAMLOOPS AIRPORT AND KAMLOOPS PRATT ROAD STATION (2014).
4) HSU = HYDROSTRATIGRAPHIC UNIT; VWP = VIBRATING WIRE PIEZOMETER; TSF = TAILINGS STORAGE FACILITY; EMRSF = EAST MINE ROCK STORAGE FACILITY; SMRSF = SOUTH MINE ROCK STORAGE FACILITY.

SCALE: AS SHOWN	DRAWN: CK	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY	PROJECT: AJAX PROJECT ENVIRONMENTAL ASSESSMENT BASELINE GROUNDWATER HYDROLOGY ASSESSMENT
DATE: AUG 2015	CHECKED: CK	KGHM AJAX MINING INC.	TITLE: BGC14-007 GROUNDWATER ELEVATION TIME SERIES WITH METEOROLOGICAL DATA
PROJECT No.: 1125007-03	APPROVED: BM		FIG No.: G-15

C:\Exports\15_SMRSF_PIEZ_BGC14-007.grf



MONITORING INTERVAL DETAILS

	SCREEN INT. (M ASL)	COLLAR EL. (M ASL)	HSU
BGC14-008D	848 TO 851	878	IRON MASK HYBRID
BGC14-008S	871 TO 873	878	FLUVIAL / GLACIOFLUVIAL

CLIMATE DATA

- Total Precipitation (mm)
- Total Snowfall (cm)
- Average Daily Temperature (°C)

WATER LEVEL DATA

- BGC14-008D — DATALOGGER
- BGC14-008S • MANUAL MEASUREMENT

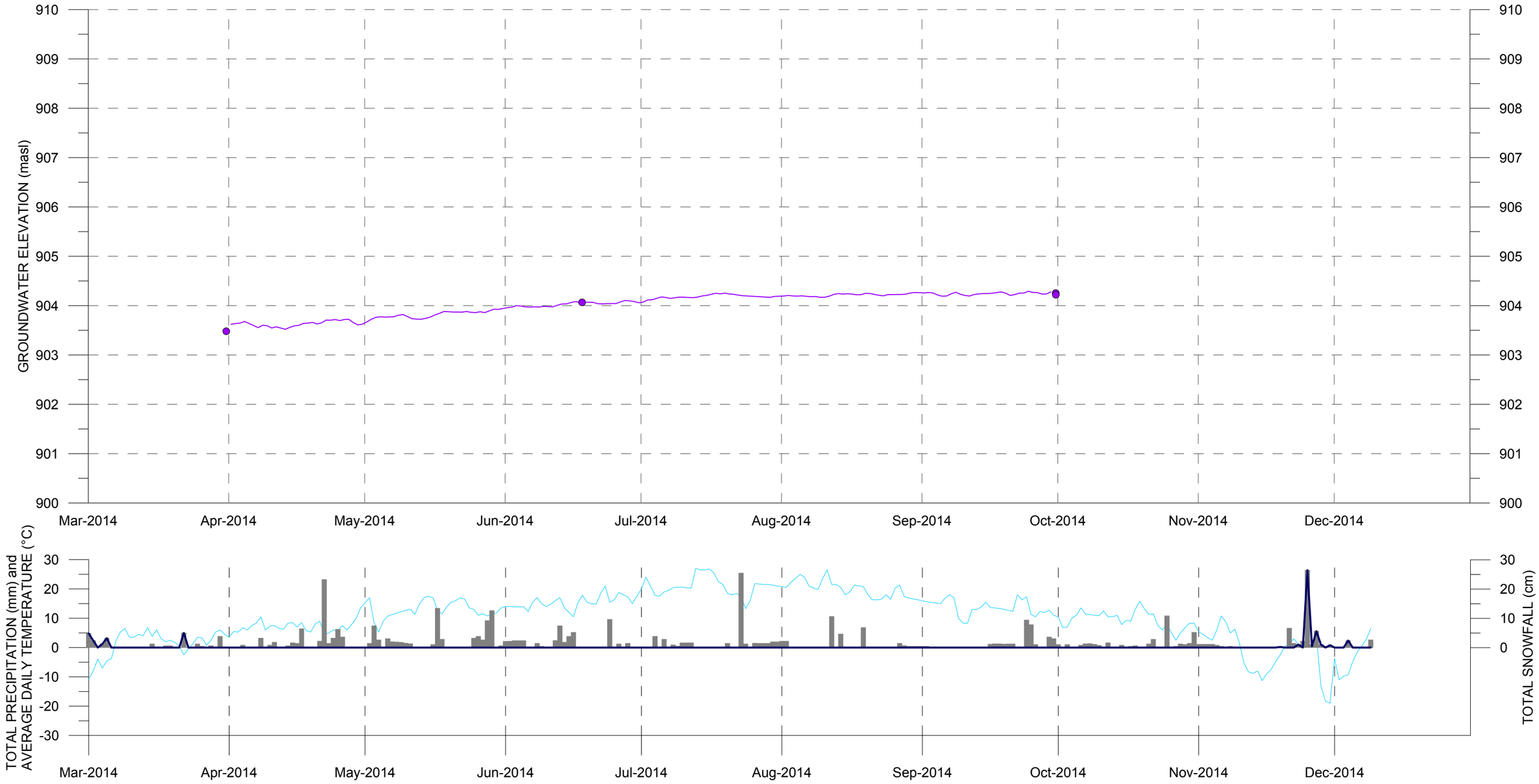
GENERAL MONITORING LOCATION

SMRSF

NOTES:
1) WELL LOCATIONS SHOWN ON DRAWING 03; WELL COMPLETION DETAILS SUMMARIZED IN TABLE 1.
2) BOREHOLE LOGS INCLUDED IN APPENDIX A.
3) CLIMATE DATA FROM ENVIRONMENT CANADA, KAMLOOPS AIRPORT AND KAMLOOPS PRATT ROAD STATION (2014).
4) HSU = HYDROSTRATIGRAPHIC UNIT; VWP = VIBRATING WIRE PIEZOMETER; TSF = TAILINGS STORAGE FACILITY; EMRSF = EAST MINE ROCK STORAGE FACILITY; SMRSF = SOUTH MINE ROCK STORAGE FACILITY.

SCALE: AS SHOWN	DRAWN: CK	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY	PROJECT: AJAX PROJECT ENVIRONMENTAL ASSESSMENT BASELINE GROUNDWATER HYDROLOGY ASSESSMENT
DATE: AUG 2015	CHECKED: CK	KGHM AJAX MINING INC.	TITLE: BGC14-008 GROUNDWATER ELEVATION TIME SERIES WITH METEOROLOGICAL DATA
PROJECT No.: 1125007-03	APPROVED: BM		FIG No.: G-16

C:\Exports\16_SMRSF_PIEZ_BGC14-008.grf



MONITORING INTERVAL DETAILS

	SCREEN INT. (M ASL)	COLLAR EL. (M ASL)	HSU
BGC14-009	865 TO 871	919	IRON MASK HYBRID

CLIMATE DATA

- Total Precipitation (mm)
- Total Snowfall (cm)
- Average Daily Temperature (°C)

WATER LEVEL DATA

- BGC14-009
- MANUAL MEASUREMENT
- DATALOGGER

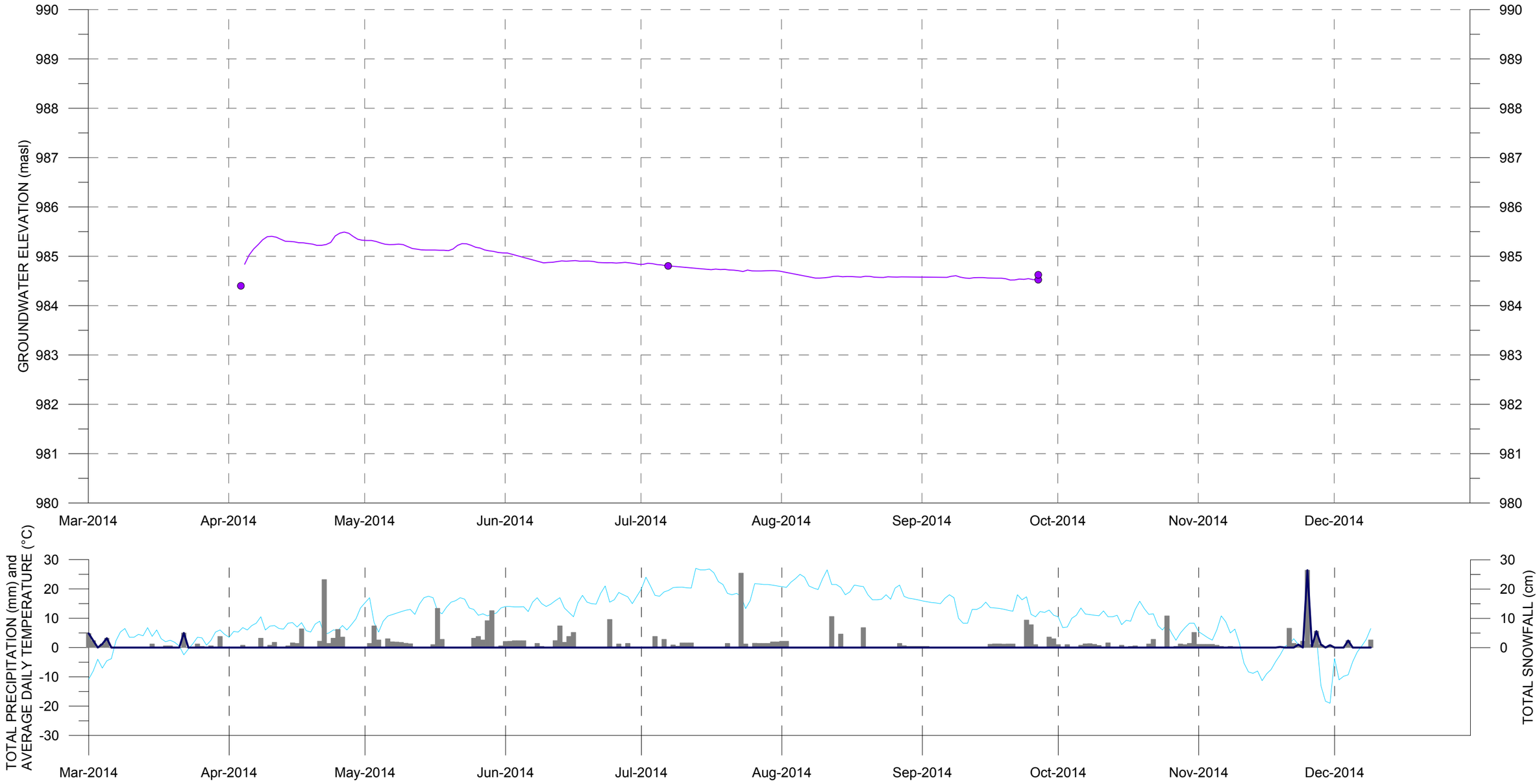
GENERAL MONITORING LOCATION

SMRSF

NOTES:
1) WELL LOCATIONS SHOWN ON DRAWING 03; WELL COMPLETION DETAILS SUMMARIZED IN TABLE 1.
2) BOREHOLE LOGS INCLUDED IN APPENDIX A.
3) CLIMATE DATA FROM ENVIRONMENT CANADA, KAMLOOPS AIRPORT AND KAMLOOPS PRATT ROAD STATION (2014).
4) HSU = HYDROSTRATIGRAPHIC UNIT; VWP = VIBRATING WIRE PIEZOMETER; TSF = TAILINGS STORAGE FACILITY; EMRSF = EAST MINE ROCK STORAGE FACILITY; SMRSF = SOUTH MINE ROCK STORAGE FACILITY.

SCALE: AS SHOWN	DRAWN: CK	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY	PROJECT: AJAX PROJECT ENVIRONMENTAL ASSESSMENT BASELINE GROUNDWATER HYDROLOGY ASSESSMENT
DATE: AUG 2015	CHECKED: CK	KGHM AJAX MINING INC.	TITLE: BGC14-009 GROUNDWATER ELEVATION TIME SERIES WITH METEOROLOGICAL DATA
PROJECT No.: 1125007-03	APPROVED: BM		FIG No.: G-17

C:\Exports\17_SMRSF_PIEZ_BGC14-009.grf



MONITORING INTERVAL DETAILS

	SCREEN INT. (M ASL)	COLLAR EL. (M ASL)	HSU
BGC14-013	956 TO 959	987	NICOLA GROUP

CLIMATE DATA

- Total Precipitation (mm)
- Total Snowfall (cm)
- Average Daily Temperature (°C)

WATER LEVEL DATA

- BGC14-013
- MANUAL MEASUREMENT
- DATALOGGER

GENERAL MONITORING LOCATION

SMRSF

NOTES:
1) WELL LOCATIONS SHOWN ON DRAWING 03; WELL COMPLETION DETAILS SUMMARIZED IN TABLE 1.
2) BOREHOLE LOGS INCLUDED IN APPENDIX A.
3) CLIMATE DATA FROM ENVIRONMENT CANADA, KAMLOOPS AIRPORT AND KAMLOOPS PRATT ROAD STATION (2014).
4) HSU = HYDROSTRATIGRAPHIC UNIT; VWP = VIBRATING WIRE PIEZOMETER; TSF = TAILINGS STORAGE FACILITY; EMRSF = EAST MINE ROCK STORAGE FACILITY; SMRSF = SOUTH MINE ROCK STORAGE FACILITY.

SCALE: AS SHOWN	DRAWN: CK	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY	PROJECT: AJAX PROJECT ENVIRONMENTAL ASSESSMENT BASELINE GROUNDWATER HYDROLOGY ASSESSMENT
DATE: AUG 2015	CHECKED: CK	KGHM AJAX MINING INC.	TITLE: BGC14-013 GROUNDWATER ELEVATION TIME SERIES WITH METEOROLOGICAL DATA
PROJECT No.: 1125007-03	APPROVED: BM		FIG No.: G-18

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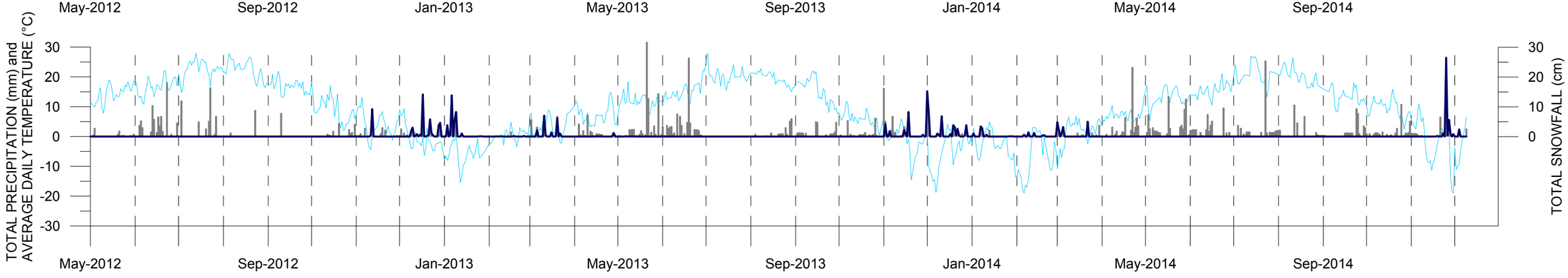


MONITORING INTERVAL DETAILS

	SCREEN INT. (M ASL)	COLLAR EL. (M ASL)	HSU
BGC14-014D	956 TO 962	986	NICOLA GROUP
BGC14-014S	967 TO 973	986	GLACIAL TILL
DH-BGC11-ES-16	973 TO 976	994	GLACIAL TILL

CLIMATE DATA

- Total Precipitation (mm)
- Total Snowfall (cm)
- Average Daily Temperature (°C)

WATER LEVEL DATA

- BGC14-014D
- BGC14-014S
- DH-BGC11-ES-16
- DATALOGGER
- MANUAL MEASUREMENT

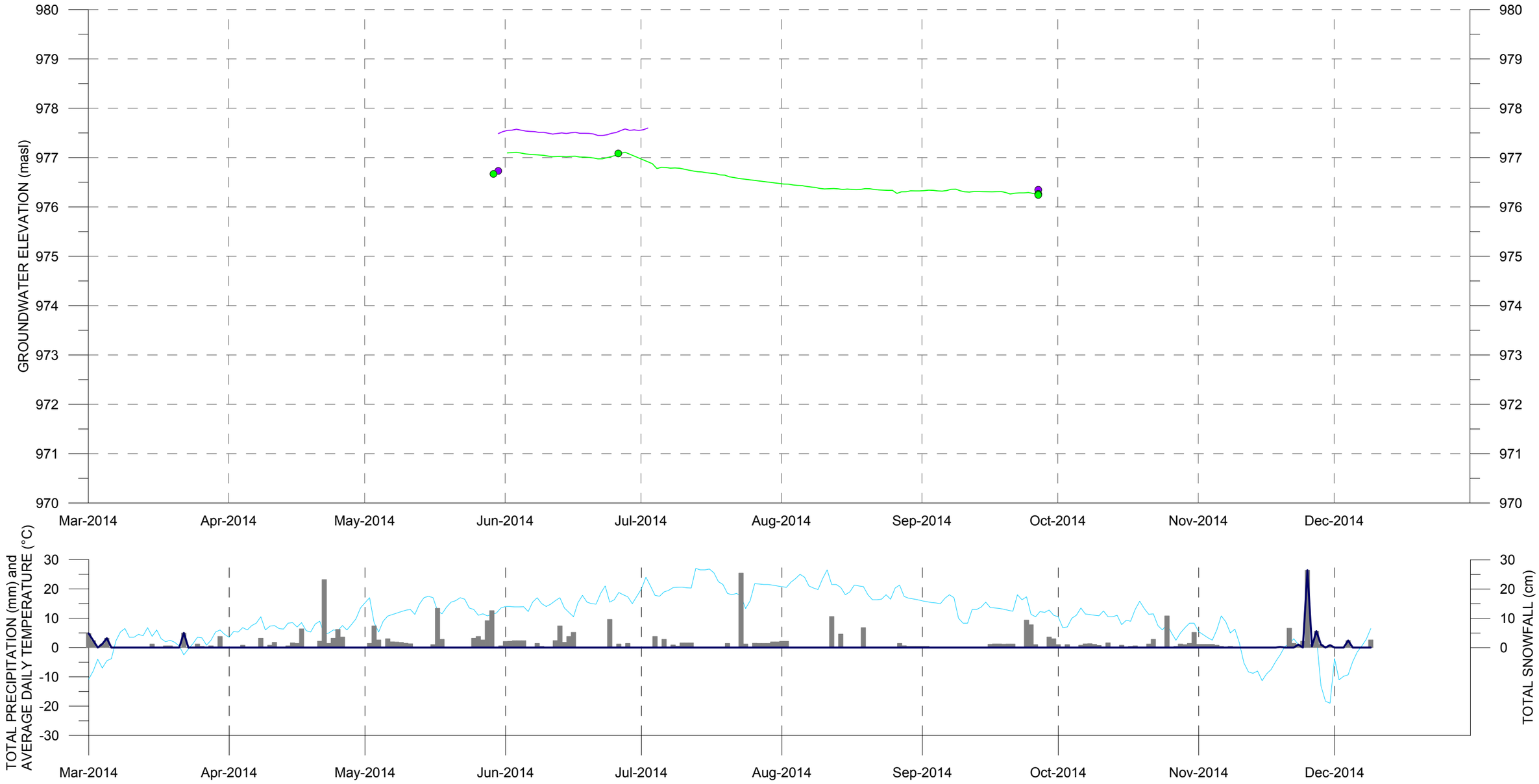
GENERAL MONITORING LOCATION

SMRSF

NOTES:
1) WELL LOCATIONS SHOWN ON DRAWING 03; WELL COMPLETION DETAILS SUMMARIZED IN TABLE 1.
2) BOREHOLE LOGS INCLUDED IN APPENDIX A.
3) CLIMATE DATA FROM ENVIRONMENT CANADA, KAMLOOPS AIRPORT AND KAMLOOPS PRATT ROAD STATION (2014).
4) HSU = HYDROSTRATIGRAPHIC UNIT; VWP = VIBRATING WIRE PIEZOMETER; TSF = TAILINGS STORAGE FACILITY; EMRSF = EAST MINE ROCK STORAGE FACILITY; SMRSF = SOUTH MINE ROCK STORAGE FACILITY.

SCALE: AS SHOWN	DRAWN: CK	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY	PROJECT: AJAX PROJECT ENVIRONMENTAL ASSESSMENT BASELINE GROUNDWATER HYDROLOGY ASSESSMENT
DATE: AUG 2015	CHECKED: CK	KGHM AJAX MINING INC.	TITLE: BGC14-014 and DH-BGC11-ES-16 GROUNDWATER ELEVATION TIME SERIES WITH METEOROLOGICAL DATA
PROJECT No.: 1125007-03	APPROVED: BM		FIG No.: G-19

C:\Exports\19_SMRSF_PIEZ_BGC14-014_and_ES_16.grf



MONITORING INTERVAL DETAILS

	SCREEN INT. (M ASL)	COLLAR EL. (M ASL)	HSU
BGC14-015D	947 TO 953	977	NICOLA GROUP
BGC14-015S	965 TO 968	977	GLACIAL TILL

CLIMATE DATA

- Total Precipitation (mm)
- Total Snowfall (cm)
- Average Daily Temperature (°C)

WATER LEVEL DATA

- BGC14-015D — DATALOGGER
- BGC14-015S • MANUAL MEASUREMENT

GENERAL MONITORING LOCATION

SMRSF

NOTES:
1) WELL LOCATIONS SHOWN ON DRAWING 03; WELL COMPLETION DETAILS SUMMARIZED IN TABLE 1.
2) BOREHOLE LOGS INCLUDED IN APPENDIX A.
3) CLIMATE DATA FROM ENVIRONMENT CANADA, KAMLOOPS AIRPORT AND KAMLOOPS PRATT ROAD STATION (2014).
4) HSU = HYDROSTRATIGRAPHIC UNIT; VWP = VIBRATING WIRE PIEZOMETER; TSF = TAILINGS STORAGE FACILITY; EMRSF = EAST MINE ROCK STORAGE FACILITY; SMRSF = SOUTH MINE ROCK STORAGE FACILITY.

SCALE: AS SHOWN	DRAWN: CK	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY	PROJECT: AJAX PROJECT ENVIRONMENTAL ASSESSMENT BASELINE GROUNDWATER HYDROLOGY ASSESSMENT
DATE: AUG 2015	CHECKED: CK	KGHM AJAX MINING INC.	TITLE: BGC14-015 GROUNDWATER ELEVATION TIME SERIES WITH METEOROLOGICAL DATA
PROJECT No.: 1125007-03	APPROVED: BM		FIG No.: G-20

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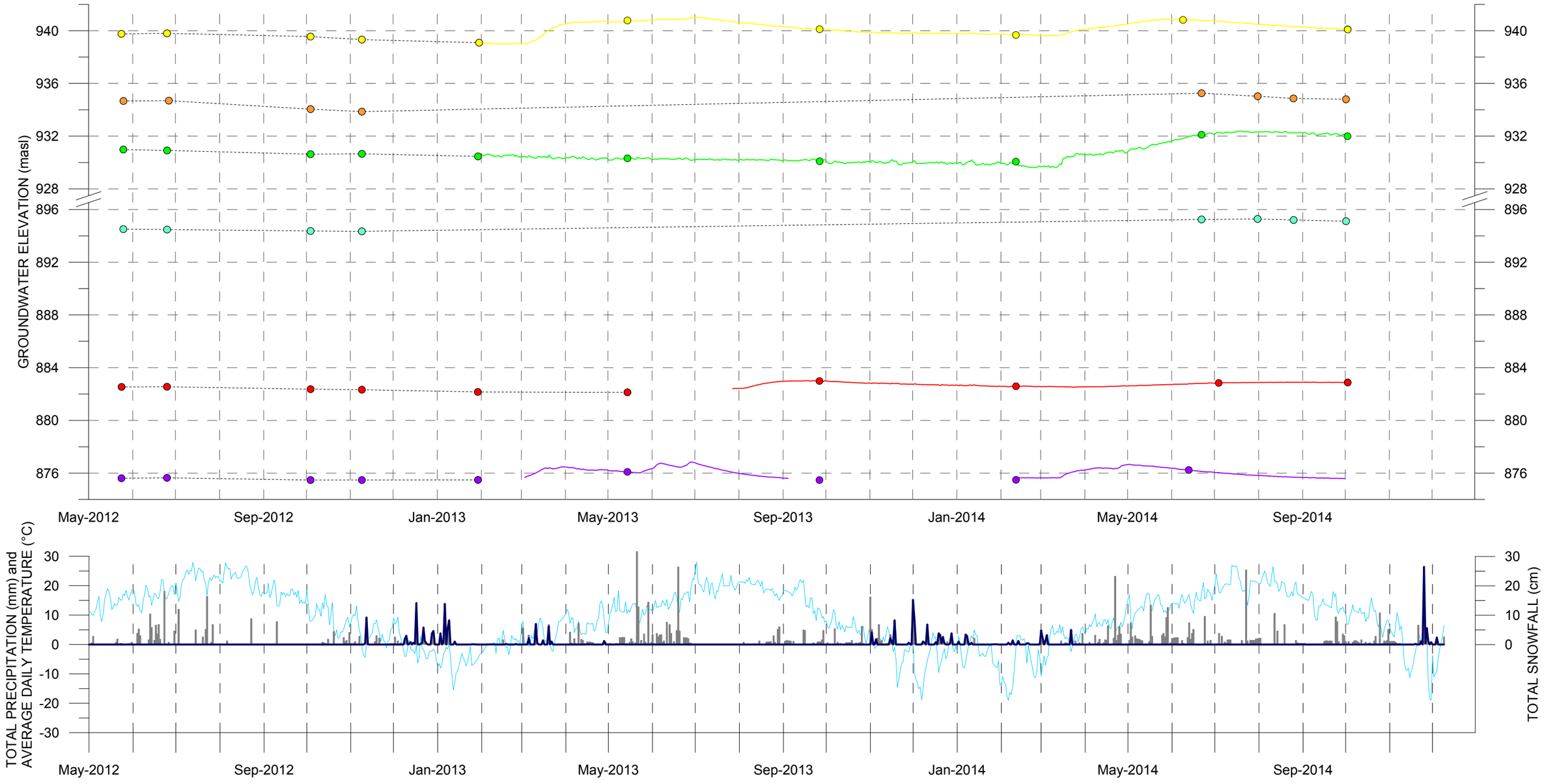

MONITORING INTERVAL DETAILS

	SCREEN INT. (M ASL)	COLLAR EL. (M ASL)	HSU
DH-BGC11-ND-09	875 TO 878	879	GLACIAL TILL
DH-BGC11-ND-08	879 TO 882	899	GLACIAL TILL
DH-BGC11-ND-07	893 TO 896	898	GLACIAL TILL
DH-BGC11-ND-06	922 TO 925	948	GLACIAL TILL
DH-BGC11-ND-26	924 TO 930	937	IRON MASK HYBRID
DH-BGC11-ND-05	935 TO 938	943	GLACIAL TILL

NOTES:
1) WELL LOCATIONS SHOWN ON DRAWING 03; WELL COMPLETION DETAILS SUMMARIZED IN TABLE 1.
2) BOREHOLE LOGS INCLUDED IN APPENDIX A.
3) CLIMATE DATA FROM ENVIRONMENT CANADA, KAMLOOPS AIRPORT AND KAMLOOPS PRATT ROAD STATION (2014).
4) HSU = HYDROSTRATIGRAPHIC UNIT; VWP = VIBRATING WIRE PIEZOMETER; TSF = TAILINGS STORAGE FACILITY; EMRSF = EAST MINE ROCK STORAGE FACILITY; SMRSF = SOUTH MINE ROCK STORAGE FACILITY.

CLIMATE DATA

- Total Precipitation (mm)
- Total Snowfall (cm)
- Average Daily Temperature (°C)

WATER LEVEL DATA

- DH-BGC11-ND-09
- DH-BGC11-ND-08
- DH-BGC11-ND-07
- DH-BGC11-ND-06
- DH-BGC11-ND-26
- DH-BGC11-ND-05
- DATALOGGER
- MANUAL MEASUREMENT

GENERAL MONITORING LOCATION

JACKO LAKE NORTH

SCALE: AS SHOWN	DRAWN: CK	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY	PROJECT: AJAX PROJECT ENVIRONMENTAL ASSESSMENT BASELINE GROUNDWATER HYDROLOGY ASSESSMENT
DATE: AUG 2015	CHECKED: CK	KGHM AJAX MINING INC.	TITLE: DH-BGC11-ND-05, 06, 07, 08, 09 AND 26 GROUNDWATER ELEVATION TIME SERIES WITH METEOROLOGICAL DATA
PROJECT No.: 1125007-03	APPROVED: BM		FIG No.: G-21

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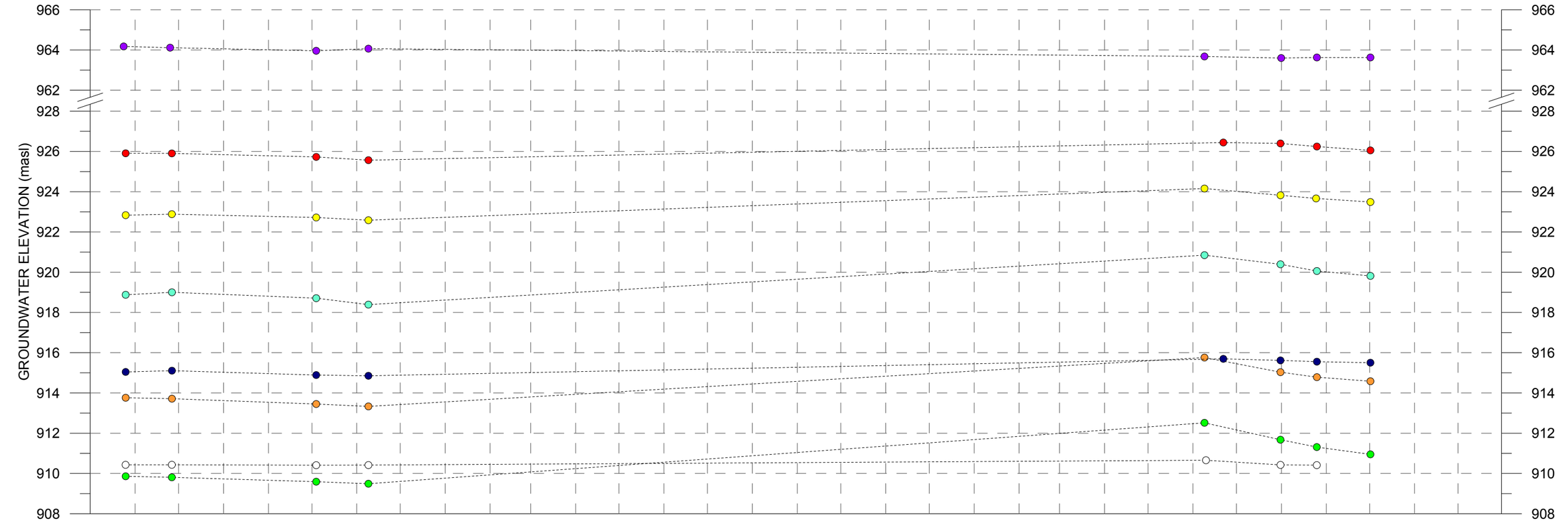

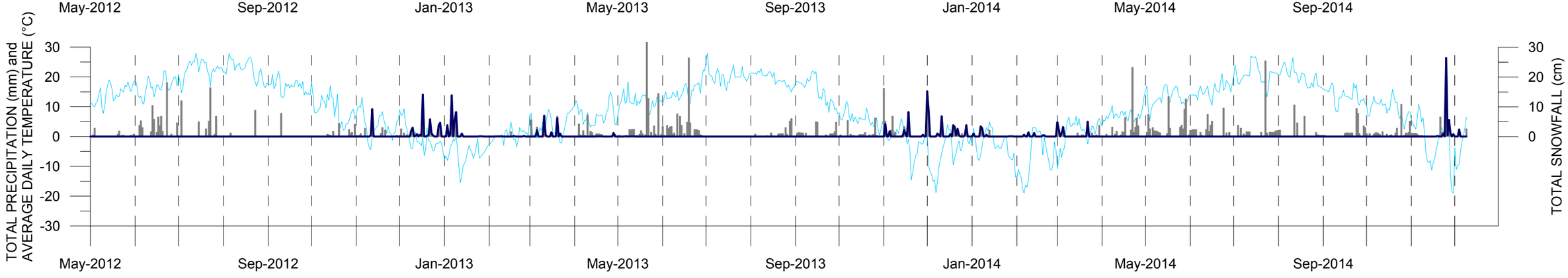

MONITORING INTERVAL DETAILS

	SCREEN INT. (M ASL)	COLLAR EL. (M ASL)	HSU
DH-BGC11-PS-20	907 TO 913	915	IRON MASK HYBRID
DH-BGC11-PS-25	910 TO 916	920	IRON MASK HYBRID
DH-BGC11-PS-24	910 TO 916	921	IRON MASK HYBRID
DH-BGC11-PS-19	913 TO 916	917	GLACIAL TILL
DH-BGC11-PS-23	912 TO 921	926	GLACIAL TILL
DH-BGC11-PS-21	913 TO 922	927	IRON MASK HYBRID
DH-BGC11-PS-22	918 TO 924	934	IRON MASK HYBRID
DH-BGC11-PS-03	954 TO 960	987	IRON MASK HYBRID

CLIMATE DATA

- Total Precipitation (mm)
- Total Snowfall (cm)
- Average Daily Temperature (°C)

WATER LEVEL DATA

- DH-BGC11-PS-03
- DH-BGC11-PS-22
- DH-BGC11-PS-23
- DH-BGC11-PS-20
- DH-BGC11-PS-19
- DH-BGC11-PS-21
- DH-BGC11-PS-24
- DH-BGC11-PS-25

GENERAL MONITORING LOCATION

JACKO LAKE NORTH

NOTES:
1) WELL LOCATIONS SHOWN ON DRAWING 03; WELL COMPLETION DETAILS SUMMARIZED IN TABLE 1.
2) BOREHOLE LOGS INCLUDED IN APPENDIX A.
3) CLIMATE DATA FROM ENVIRONMENT CANADA, KAMLOOPS AIRPORT AND KAMLOOPS PRATT ROAD STATION (2014).
4) HSU = HYDROSTRATIGRAPHIC UNIT; VWP = VIBRATING WIRE PIEZOMETER; TSF = TAILINGS STORAGE FACILITY; EMRSF = EAST MINE ROCK STORAGE FACILITY; SMRSF = SOUTH MINE ROCK STORAGE FACILITY.

SCALE: AS SHOWN	DRAWN: CK	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY	PROJECT: AJAX PROJECT ENVIRONMENTAL ASSESSMENT BASELINE GROUNDWATER HYDROLOGY ASSESSMENT
DATE: AUG 2015	CHECKED: CK	KGHM AJAX MINING INC.	TITLE: DH-BGC11-PS-03, 19, 20, 21, 22, 23, 24 AND 25 GROUNDWATER ELEVATION TIME SERIES WITH METEOROLOGICAL DATA
PROJECT No.: 1125007-03	APPROVED: BM		FIG No.: G-22

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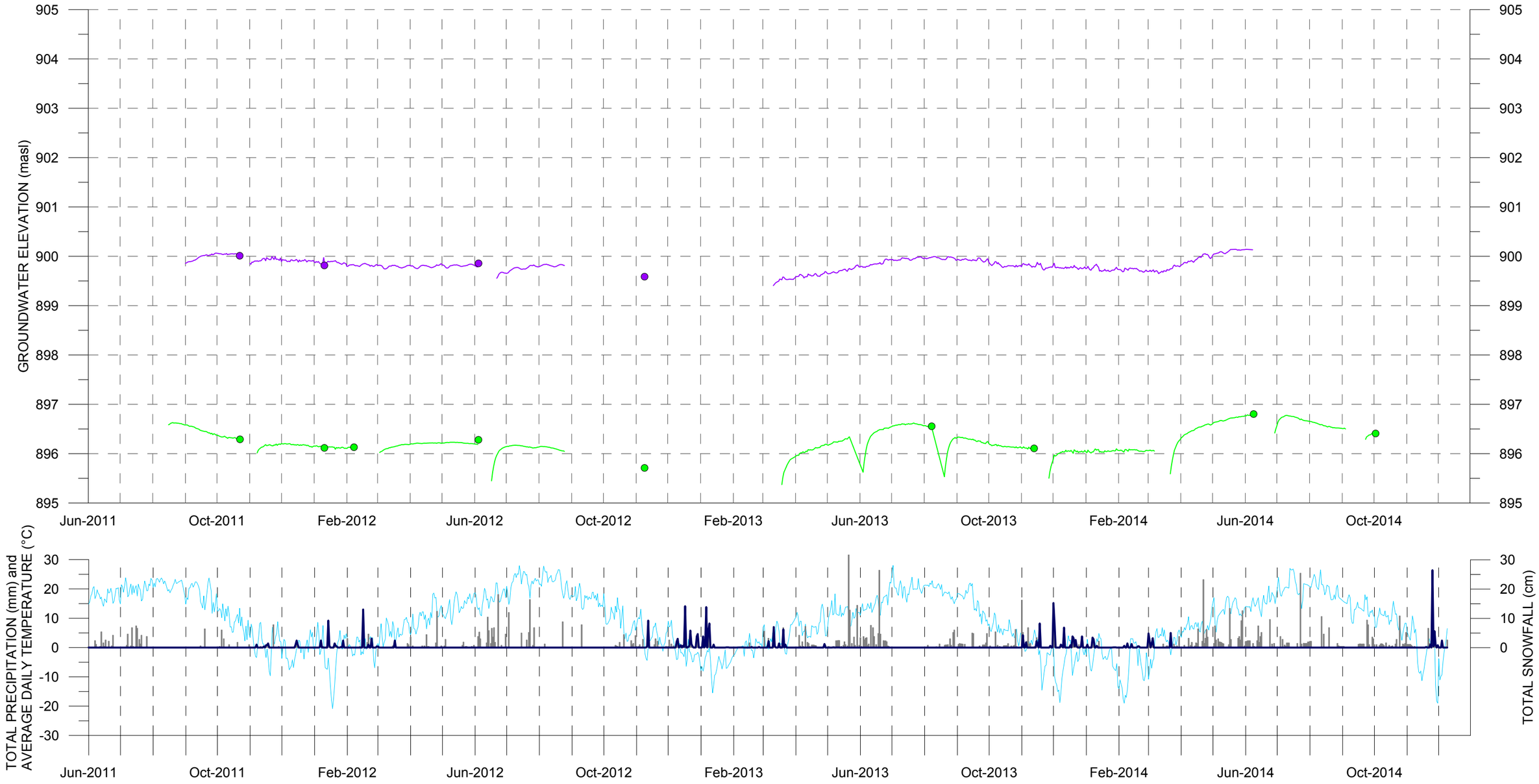

MONITORING INTERVAL DETAILS

	SCREEN INT. (M ASL)	COLLAR EL. (M ASL)	HSU
MW11-04D	865 TO 868	899	IRON MASK HYBRID
MW11-04S	879 TO 882	899	IRON MASK HYBRID

CLIMATE DATA

- Total Precipitation (mm)
- Total Snowfall (cm)
- Average Daily Temperature (°C)

WATER LEVEL DATA

- MW11-04D — DATALOGGER
- MW11-04S • MANUAL MEASUREMENT

GENERAL MONITORING LOCATION

JACKO LAKE NORTH

NOTES:
1) WELL LOCATIONS SHOWN ON DRAWING 03; WELL COMPLETION DETAILS SUMMARIZED IN TABLE 1.
2) BOREHOLE LOGS INCLUDED IN APPENDIX A.
3) CLIMATE DATA FROM ENVIRONMENT CANADA, KAMLOOPS AIRPORT AND KAMLOOPS PRATT ROAD STATION (2014).
4) HSU = HYDROSTRATIGRAPHIC UNIT; VWP = VIBRATING WIRE PIEZOMETER; TSF = TAILINGS STORAGE FACILITY; EMRSF = EAST MINE ROCK STORAGE FACILITY; SMRSF = SOUTH MINE ROCK STORAGE FACILITY.

SCALE: AS SHOWN	DRAWN: CK	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY	PROJECT: AJAX PROJECT ENVIRONMENTAL ASSESSMENT BASELINE GROUNDWATER HYDROLOGY ASSESSMENT
DATE: AUG 2015	CHECKED: CK	KGHM AJAX MINING INC.	TITLE: MW11-04 GROUNDWATER ELEVATION TIME SERIES WITH METEOROLOGICAL DATA
PROJECT No.: 1125007-03	APPROVED: BM		FIG No.: G-23

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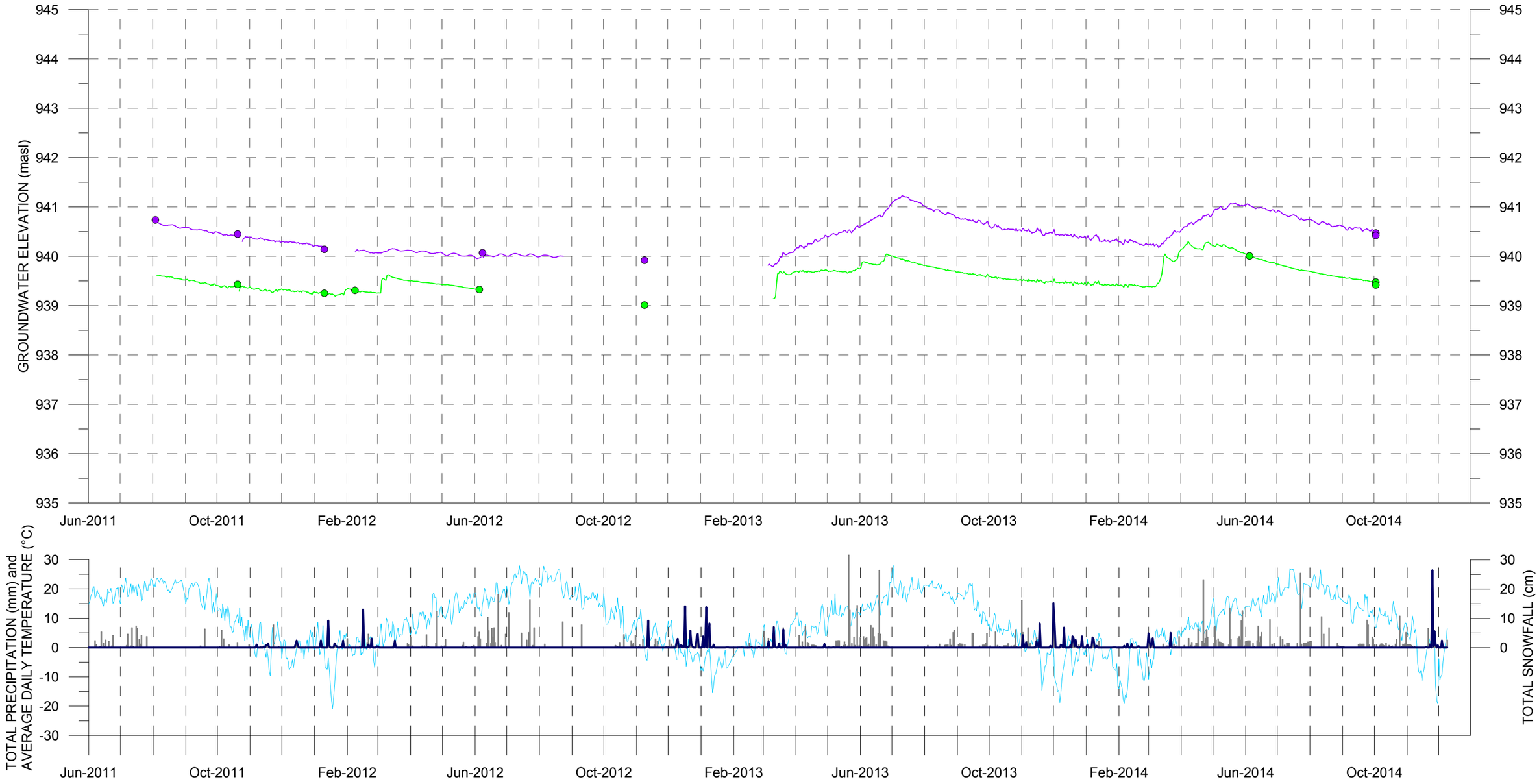

MONITORING INTERVAL DETAILS

	SCREEN INT. (M ASL)	COLLAR EL. (M ASL)	HSU
MW11-07D	890 TO 893	941	IRON MASK HYBRID
MW11-07S	934 TO 935	941	IRON MASK HYBRID

CLIMATE DATA

- Total Precipitation (mm)
- Total Snowfall (cm)
- Average Daily Temperature (°C)

WATER LEVEL DATA

- MW11-07D — DATALOGGER
- MW11-07S • MANUAL MEASUREMENT

GENERAL MONITORING LOCATION

JACKO LAKE NORTH

NOTES:
1) WELL LOCATIONS SHOWN ON DRAWING 03; WELL COMPLETION DETAILS SUMMARIZED IN TABLE 1.
2) BOREHOLE LOGS INCLUDED IN APPENDIX A.
3) CLIMATE DATA FROM ENVIRONMENT CANADA, KAMLOOPS AIRPORT AND KAMLOOPS PRATT ROAD STATION (2014).
4) HSU = HYDROSTRATIGRAPHIC UNIT; VWP = VIBRATING WIRE PIEZOMETER; TSF = TAILINGS STORAGE FACILITY; EMRSF = EAST MINE ROCK STORAGE FACILITY; SMRSF = SOUTH MINE ROCK STORAGE FACILITY.

SCALE: AS SHOWN	DRAWN: CK	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY	PROJECT: AJAX PROJECT ENVIRONMENTAL ASSESSMENT BASELINE GROUNDWATER HYDROLOGY ASSESSMENT
DATE: AUG 2015	CHECKED: CK	KGHM AJAX MINING INC.	TITLE: MW11-07 GROUNDWATER ELEVATION TIME SERIES WITH METEOROLOGICAL DATA
PROJECT No.: 1125007-03	APPROVED: BM		FIG No.: G-24

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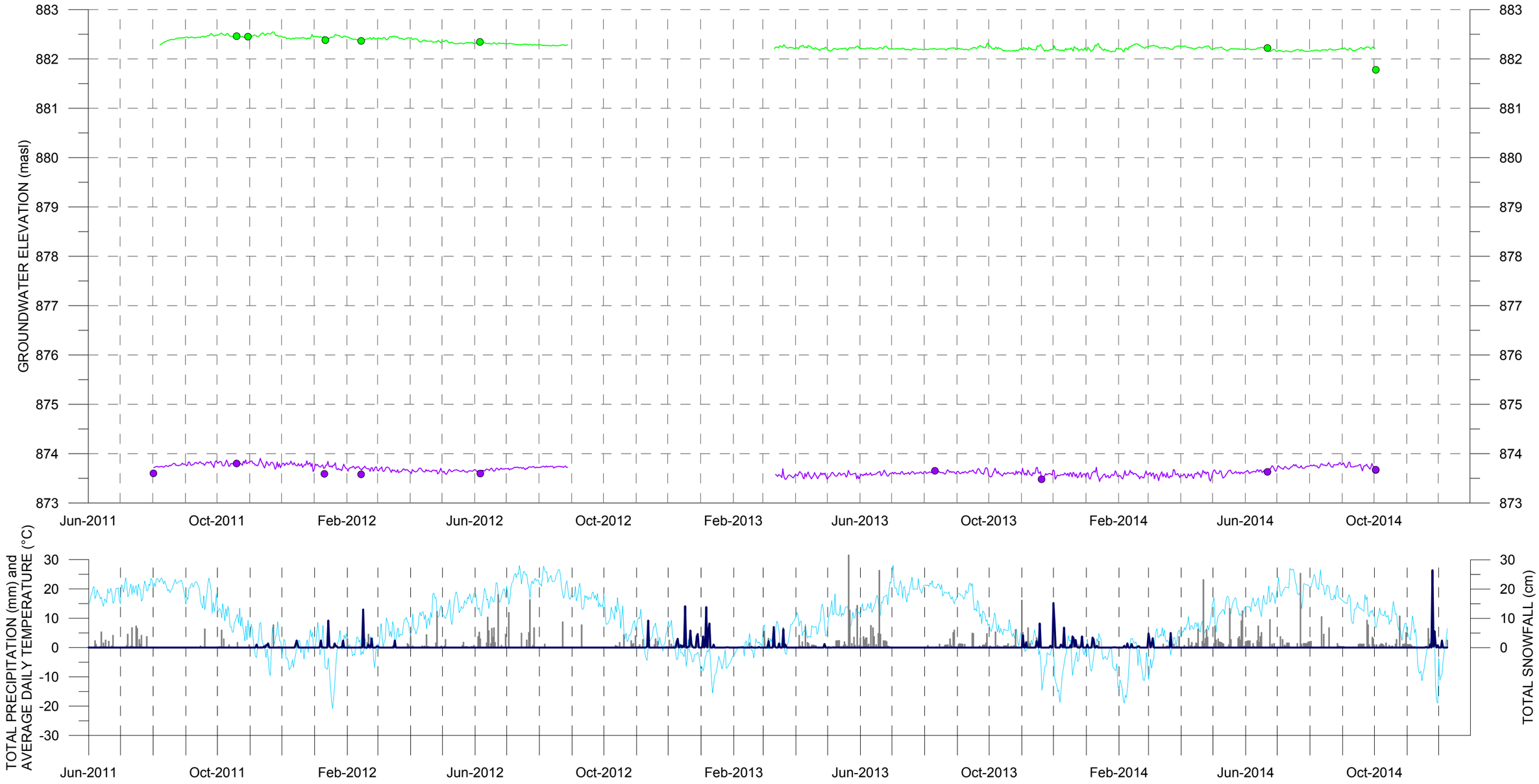

MONITORING INTERVAL DETAILS

	SCREEN INT. (M ASL)	COLLAR EL. (M ASL)	HSU
MW11-08D	864 TO 865	897	NICOLA GROUP
MW11-08S	879 TO 882	897	GLACIAL TILL

CLIMATE DATA

- Total Precipitation (mm)
- Total Snowfall (cm)
- Average Daily Temperature (°C)

WATER LEVEL DATA

- MW11-08D — DATALOGGER
- MW11-08S • MANUAL MEASUREMENT

GENERAL MONITORING LOCATION

JACKO LAKE SOUTH

NOTES:
1) WELL LOCATIONS SHOWN ON DRAWING 03; WELL COMPLETION DETAILS SUMMARIZED IN TABLE 1.
2) BOREHOLE LOGS INCLUDED IN APPENDIX A.
3) CLIMATE DATA FROM ENVIRONMENT CANADA, KAMLOOPS AIRPORT AND KAMLOOPS PRATT ROAD STATION (2014).
4) HSU = HYDROSTRATIGRAPHIC UNIT; VWP = VIBRATING WIRE PIEZOMETER; TSF = TAILINGS STORAGE FACILITY; EMRSF = EAST MINE ROCK STORAGE FACILITY; SMRSF = SOUTH MINE ROCK STORAGE FACILITY.

SCALE: AS SHOWN	DRAWN: CK	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY	PROJECT: AJAX PROJECT ENVIRONMENTAL ASSESSMENT BASELINE GROUNDWATER HYDROLOGY ASSESSMENT
DATE: AUG 2015	CHECKED: CK	KGHM AJAX MINING INC.	TITLE: MW11-08 GROUNDWATER ELEVATION TIME SERIES WITH METEOROLOGICAL DATA
PROJECT No.: 1125007-03	APPROVED: BM		FIG No.: G-25

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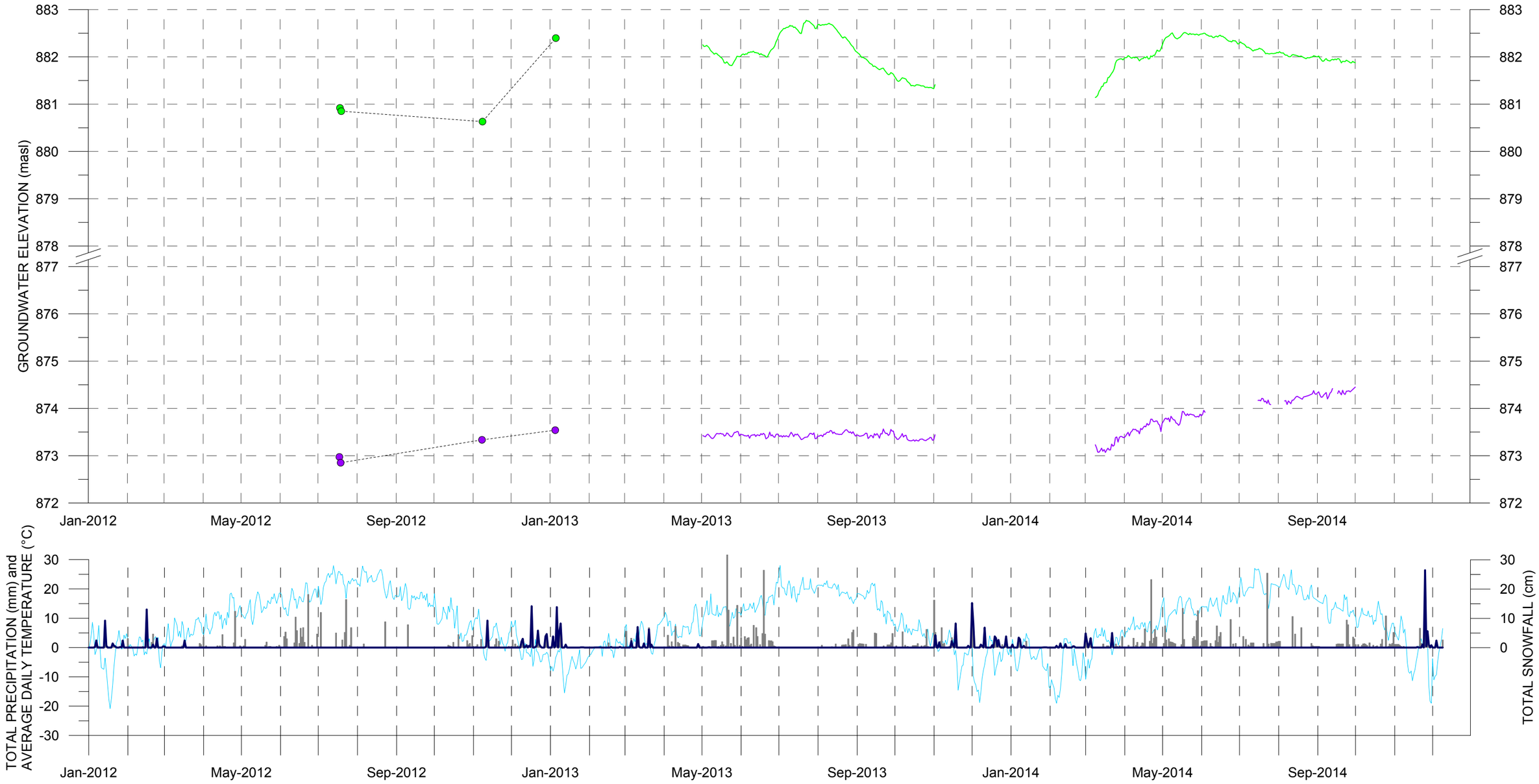


MONITORING INTERVAL DETAILS

	VWP EL. (M ASL)	COLLAR EL. (M ASL)	HSU
AW-09-103-D	558	901	PICRITE
AW-09-103-S	821	901	NICOLA GROUP

CLIMATE DATA

- Total Precipitation (mm)
- Total Snowfall (cm)
- Average Daily Temperature (°C)

WATER LEVEL DATA

- AW-09-103-D
- AW-09-103-S
- DATALOGGER
- MANUAL MEASUREMENT

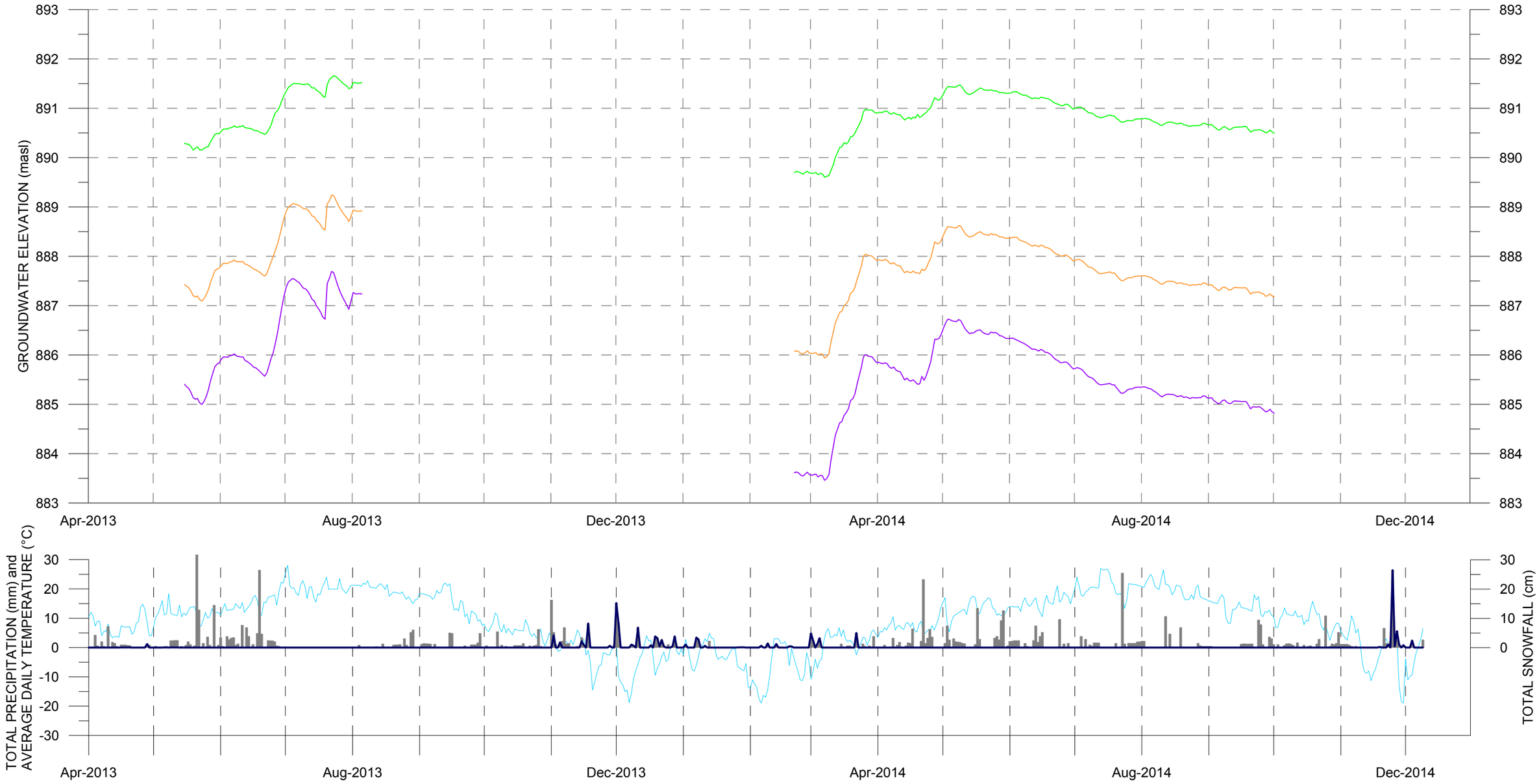
GENERAL MONITORING LOCATION

OPEN PIT SOUTHWEST WALL

NOTES:
1) WELL LOCATIONS SHOWN ON DRAWING 03; WELL COMPLETION DETAILS SUMMARIZED IN TABLE 1.
2) BOREHOLE LOGS INCLUDED IN APPENDIX A.
3) CLIMATE DATA FROM ENVIRONMENT CANADA, KAMLOOPS AIRPORT AND KAMLOOPS PRATT ROAD STATION (2014).
4) HSU = HYDROSTRATIGRAPHIC UNIT; VWP = VIBRATING WIRE PIEZOMETER; TSF = TAILINGS STORAGE FACILITY; EMRSF = EAST MINE ROCK STORAGE FACILITY; SMRSF = SOUTH MINE ROCK STORAGE FACILITY.

SCALE: AS SHOWN	DRAWN: CK	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY	PROJECT: AJAX PROJECT ENVIRONMENTAL ASSESSMENT BASELINE GROUNDWATER HYDROLOGY ASSESSMENT
DATE: AUG 2015	CHECKED: CK	KGHM AJAX MINING INC.	TITLE: AW-09-103 GROUNDWATER ELEVATION TIME SERIES WITH METEOROLOGICAL DATA
PROJECT No.: 1125007-03	APPROVED: BM		FIG No.: G-26

C:\Exports\26_PIT_SW_WALL_VW_AW-09-103.grf



MONITORING INTERVAL DETAILS

	VWP EL. (M ASL)	COLLAR EL. (M ASL)	HSU
BGC10-MWA-075	830	905	GLACIAL TILL
BGC10-MWA-125	780	905	SUGARLOAF DIORITE
BGC10-MWA-175	730	905	SUGARLOAF DIORITE

CLIMATE DATA

- Total Precipitation (mm)
- Total Snowfall (cm)
- Average Daily Temperature (°C)

WATER LEVEL DATA

- BGC10-MWA-175
- BGC10-MWA-125
- BGC10-MWA-075
- DATALOGGER
- MANUAL MEASUREMENT

GENERAL MONITORING LOCATION

OPEN PIT SOUTHWEST WALL

NOTES:
1) WELL LOCATIONS SHOWN ON DRAWING 03; WELL COMPLETION DETAILS SUMMARIZED IN TABLE 1.
2) BOREHOLE LOGS INCLUDED IN APPENDIX A.
3) CLIMATE DATA FROM ENVIRONMENT CANADA, KAMLOOPS AIRPORT AND KAMLOOPS PRATT ROAD STATION (2014).
4) HSU = HYDROSTRATIGRAPHIC UNIT; VWP = VIBRATING WIRE PIEZOMETER; TSF = TAILINGS STORAGE FACILITY; EMRSF = EAST MINE ROCK STORAGE FACILITY; SMRSF = SOUTH MINE ROCK STORAGE FACILITY.

SCALE: AS SHOWN	DRAWN: CK	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY	PROJECT: AJAX PROJECT ENVIRONMENTAL ASSESSMENT BASELINE GROUNDWATER HYDROLOGY ASSESSMENT
DATE: AUG 2015	CHECKED: CK	KGHM AJAX MINING INC.	TITLE: BGC10-MWA GROUNDWATER ELEVATION TIME SERIES WITH METEOROLOGICAL DATA
PROJECT No.: 1125007-03	APPROVED: BM		FIG No.: G-27

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MONITORING INTERVAL DETAILS

	VWP EL. (M ASL)	COLLAR EL. (M ASL)	HSU
BGC10-MWB-075	830	905	GLACIAL TILL
BGC10-MWB-125	780	905	SUGARLOAF DIORITE
BGC10-MWB-175	730	905	SUGARLOAF DIORITE

CLIMATE DATA

- Total Precipitation (mm)
- Total Snowfall (cm)
- Average Daily Temperature (°C)

WATER LEVEL DATA

- BGC10-MWB-175
- BGC10-MWB-125
- BGC10-MWB-075
- DATALOGGER
- MANUAL MEASUREMENT

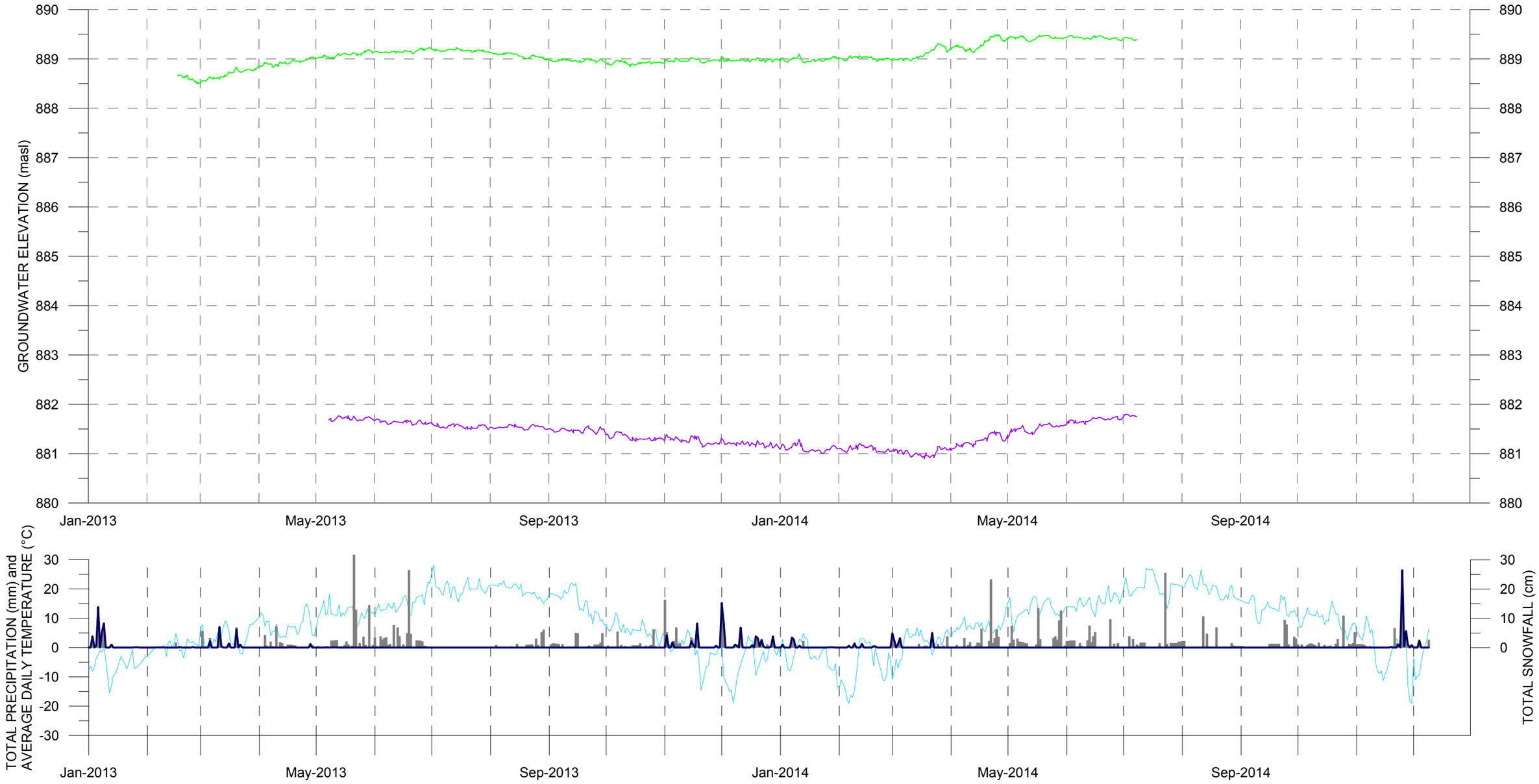
GENERAL MONITORING LOCATION

OPEN PIT SOUTHWEST WALL

NOTES:
1) WELL LOCATIONS SHOWN ON DRAWING 03; WELL COMPLETION DETAILS SUMMARIZED IN TABLE 1.
2) BOREHOLE LOGS INCLUDED IN APPENDIX A.
3) CLIMATE DATA FROM ENVIRONMENT CANADA, KAMLOOPS AIRPORT AND KAMLOOPS PRATT ROAD STATION (2014).
4) HSU = HYDROSTRATIGRAPHIC UNIT; VWP = VIBRATING WIRE PIEZOMETER; TSF = TAILINGS STORAGE FACILITY; EMRSF = EAST MINE ROCK STORAGE FACILITY; SMRSF = SOUTH MINE ROCK STORAGE FACILITY.

SCALE: AS SHOWN	DRAWN: CK	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY	PROJECT: AJAX PROJECT ENVIRONMENTAL ASSESSMENT BASELINE GROUNDWATER HYDROLOGY ASSESSMENT
DATE: AUG 2015	CHECKED: CK	KGHM AJAX MINING INC.	TITLE: BGC10-MWB GROUNDWATER ELEVATION TIME SERIES WITH METEOROLOGICAL DATA
PROJECT No.: 1125007-03	APPROVED: BM		FIG No.: G-28

C:\Export\t26_PIT_SW_WALL_VW_BGC10-MWB.grf



MONITORING INTERVAL DETAILS

	VWP EL. (M ASL)	COLLAR EL. (M ASL)	HSU
KAX-13-004-S	824	896	NICOLA GROUP
KAX-13-004-D	584	896	NICOLA GROUP

CLIMATE DATA

- Total Precipitation (mm)
- Total Snowfall (cm)
- Average Daily Temperature (°C)

WATER LEVEL DATA

- KAX-13-004-D — DATALOGGER
- KAX-13-004-S • MANUAL MEASUREMENT

GENERAL MONITORING LOCATION

OPEN PIT SOUTHWEST WALL

NOTES:
1) WELL LOCATIONS SHOWN ON DRAWING 03; WELL COMPLETION DETAILS SUMMARIZED IN TABLE 1.
2) BOREHOLE LOGS INCLUDED IN APPENDIX A.
3) CLIMATE DATA FROM ENVIRONMENT CANADA, KAMLOOPS AIRPORT AND KAMLOOPS PRATT ROAD STATION (2014).
4) HSU = HYDROSTRATIGRAPHIC UNIT; VWP = VIBRATING WIRE PIEZOMETER; TSF = TAILINGS STORAGE FACILITY; EMRSF = EAST MINE ROCK STORAGE FACILITY; SMRSF = SOUTH MINE ROCK STORAGE FACILITY.

SCALE: AS SHOWN	DRAWN: CK	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY	PROJECT: AJAX PROJECT ENVIRONMENTAL ASSESSMENT BASELINE GROUNDWATER HYDROLOGY ASSESSMENT
DATE: AUG 2015	CHECKED: CK	KGHM AJAX MINING INC.	TITLE: KAX-13-004 GROUNDWATER ELEVATION TIME SERIES WITH METEOROLOGICAL DATA
PROJECT No.: 1125007-03	APPROVED: BM		FIG No.: G-29

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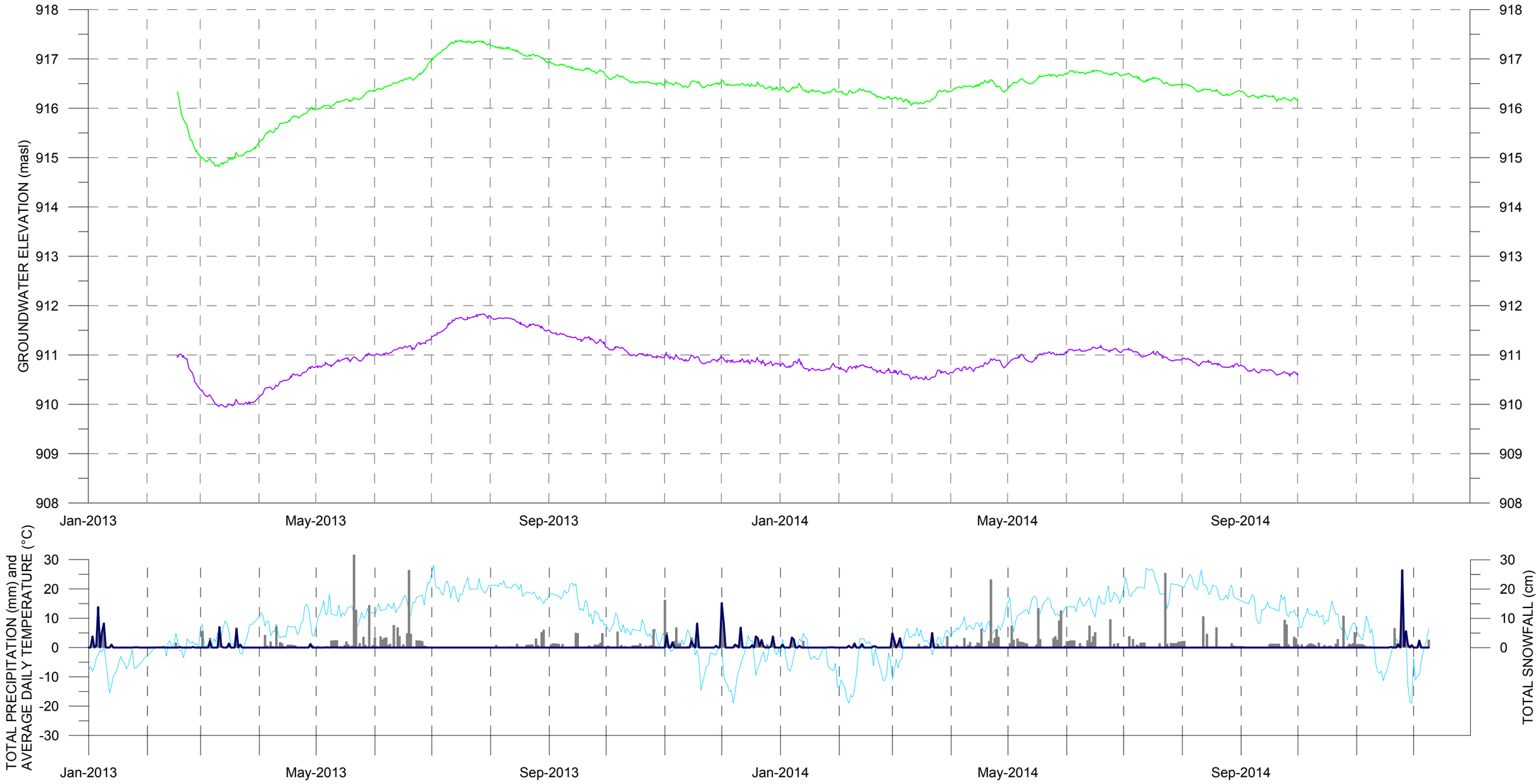

MONITORING INTERVAL DETAILS

	VWP EL. (M ASL)	COLLAR EL. (M ASL)	HSU
KAX-13-007-S	856	949	NICOLA GROUP
KAX-13-007-D	716	949	IRON MASK HYBRID

CLIMATE DATA

- Total Precipitation (mm)
- Total Snowfall (cm)
- Average Daily Temperature (°C)

WATER LEVEL DATA

- KAX-13-007-D — DATALOGGER
- KAX-13-007-S • MANUAL MEASUREMENT

GENERAL MONITORING LOCATION

OPEN PIT SOUTHWEST WALL

NOTES:
1) WELL LOCATIONS SHOWN ON DRAWING 03; WELL COMPLETION DETAILS SUMMARIZED IN TABLE 1.
2) BOREHOLE LOGS INCLUDED IN APPENDIX A.
3) CLIMATE DATA FROM ENVIRONMENT CANADA, KAMLOOPS AIRPORT AND KAMLOOPS PRATT ROAD STATION (2014).
4) HSU = HYDROSTRATIGRAPHIC UNIT; VWP = VIBRATING WIRE PIEZOMETER; TSF = TAILINGS STORAGE FACILITY; EMRSF = EAST MINE ROCK STORAGE FACILITY; SMRSF = SOUTH MINE ROCK STORAGE FACILITY.

SCALE: AS SHOWN	DRAWN: CK	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY	PROJECT: AJAX PROJECT ENVIRONMENTAL ASSESSMENT BASELINE GROUNDWATER HYDROLOGY ASSESSMENT
DATE: AUG 2015	CHECKED: CK	KGHM AJAX MINING INC.	TITLE: KAX-13-007 GROUNDWATER ELEVATION TIME SERIES WITH METEOROLOGICAL DATA
PROJECT No.: 1125007-03	APPROVED: BM		FIG No.: G-30

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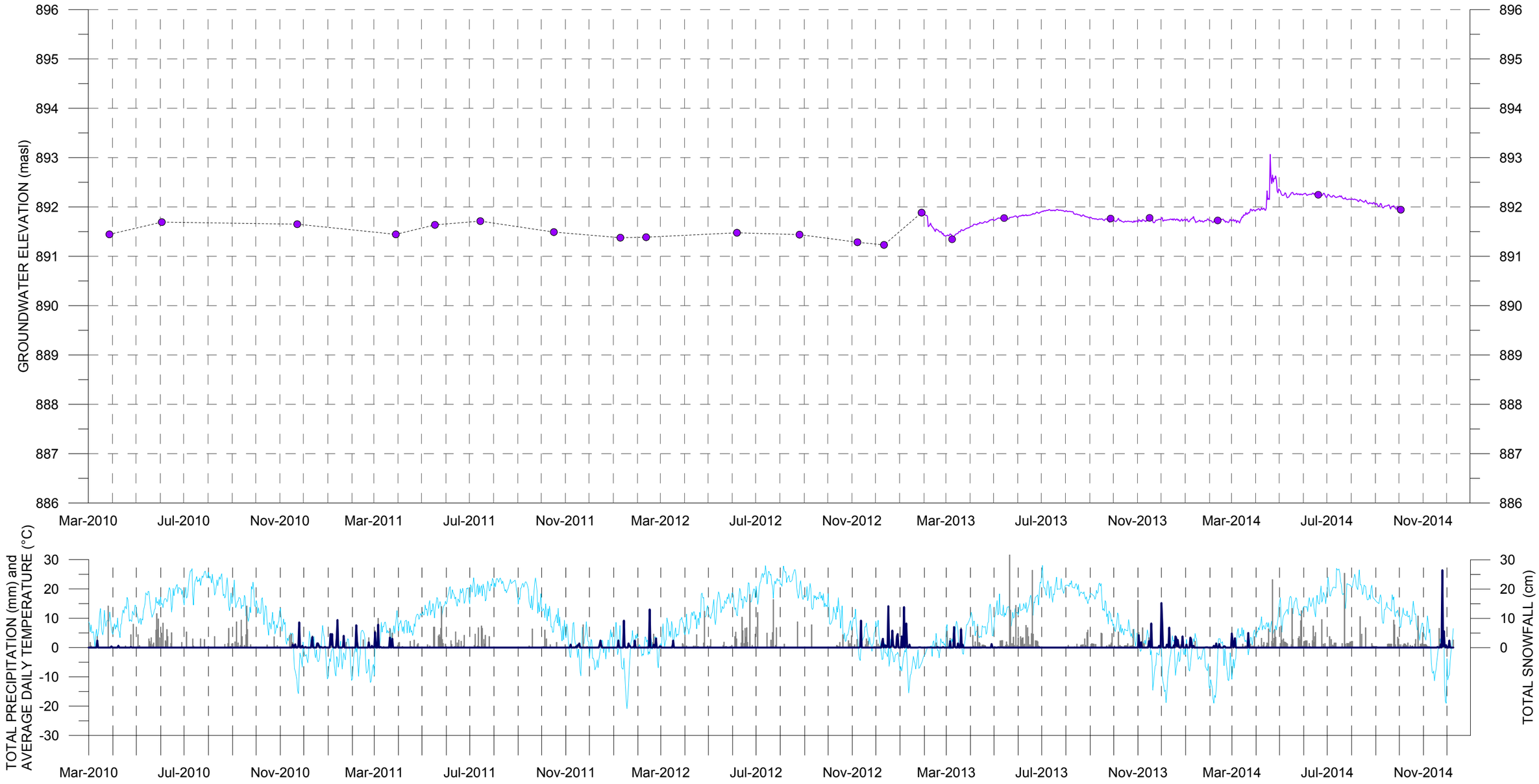

MONITORING INTERVAL DETAILS

	SCREEN INT. (M ASL)	COLLAR EL. (M ASL)	HSU
AJGW01-D	889 TO 892	903	GLACIAL TILL

CLIMATE DATA

- Total Precipitation (mm)
- Total Snowfall (cm)
- Average Daily Temperature (°C)

WATER LEVEL DATA

- AJGW01-D
- MANUAL MEASUREMENT
- DATALOGGER

GENERAL MONITORING LOCATION

OPEN PIT AREA

NOTES:
1) WELL LOCATIONS SHOWN ON DRAWING 03; WELL COMPLETION DETAILS SUMMARIZED IN TABLE 1.
2) BOREHOLE LOGS INCLUDED IN APPENDIX A.
3) CLIMATE DATA FROM ENVIRONMENT CANADA, KAMLOOPS AIRPORT AND KAMLOOPS PRATT ROAD STATION (2014).
4) HSU = HYDROSTRATIGRAPHIC UNIT; VWP = VIBRATING WIRE PIEZOMETER; TSF = TAILINGS STORAGE FACILITY; EMRSF = EAST MINE ROCK STORAGE FACILITY; SMRSF = SOUTH MINE ROCK STORAGE FACILITY.

SCALE: AS SHOWN	DRAWN: CK	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY	PROJECT: AJAX PROJECT ENVIRONMENTAL ASSESSMENT BASELINE GROUNDWATER HYDROLOGY ASSESSMENT
DATE: AUG 2015	CHECKED: CK	KGHM AJAX MINING INC.	TITLE: AJGW01 GROUNDWATER ELEVATION TIME SERIES WITH METEOROLOGICAL DATA
PROJECT No.: 1125007-03	APPROVED: BM		FIG No.: G-31

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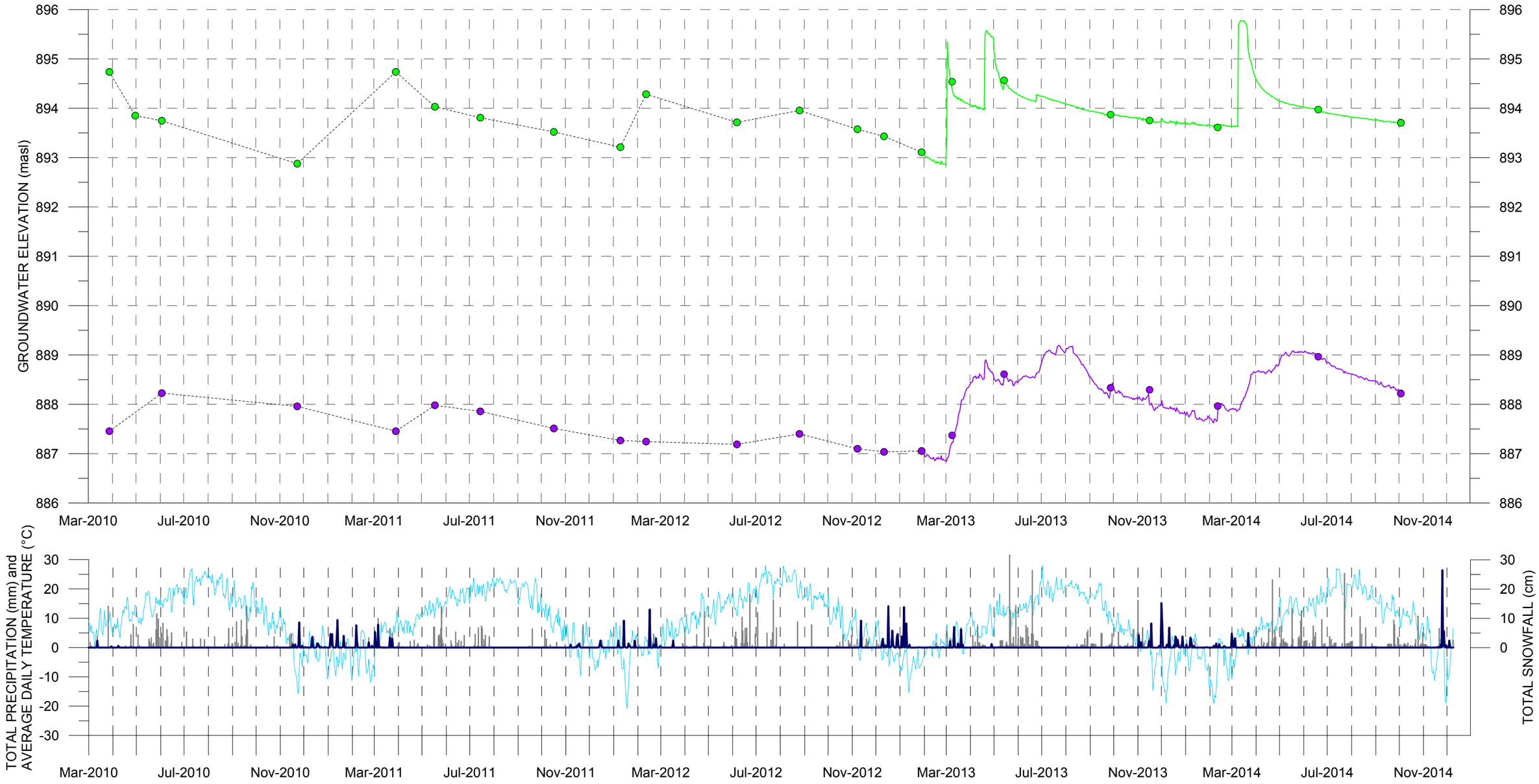

MONITORING INTERVAL DETAILS

	SCREEN INT. (M ASL)	COLLAR EL. (M ASL)	HSU
AJGW02-D	880 TO 884	900	NICOLA GROUP
AJGW02-S	892 TO 898	900	GLACIAL TILL

CLIMATE DATA

- Total Precipitation (mm)
- Total Snowfall (cm)
- Average Daily Temperature (°C)

WATER LEVEL DATA

- AJGW02-D — DATALOGGER
- AJGW02-S • MANUAL MEASUREMENT

GENERAL MONITORING LOCATION

OPEN PIT AREA

NOTES:
1) WELL LOCATIONS SHOWN ON DRAWING 03; WELL COMPLETION DETAILS SUMMARIZED IN TABLE 1.
2) BOREHOLE LOGS INCLUDED IN APPENDIX A.
3) CLIMATE DATA FROM ENVIRONMENT CANADA, KAMLOOPS AIRPORT AND KAMLOOPS PRATT ROAD STATION (2014).
4) HSU = HYDROSTRATIGRAPHIC UNIT; VWP = VIBRATING WIRE PIEZOMETER; TSF = TAILINGS STORAGE FACILITY; EMRSF = EAST MINE ROCK STORAGE FACILITY; SMRSF = SOUTH MINE ROCK STORAGE FACILITY.

SCALE: AS SHOWN	DRAWN: CK	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY	PROJECT: AJAX PROJECT ENVIRONMENTAL ASSESSMENT BASELINE GROUNDWATER HYDROLOGY ASSESSMENT
DATE: AUG 2015	CHECKED: CK	KGHM AJAX MINING INC.	TITLE: AJGW02 GROUNDWATER ELEVATION TIME SERIES WITH METEOROLOGICAL DATA
PROJECT No.: 1125007-03	APPROVED: BM		FIG No.: G-32

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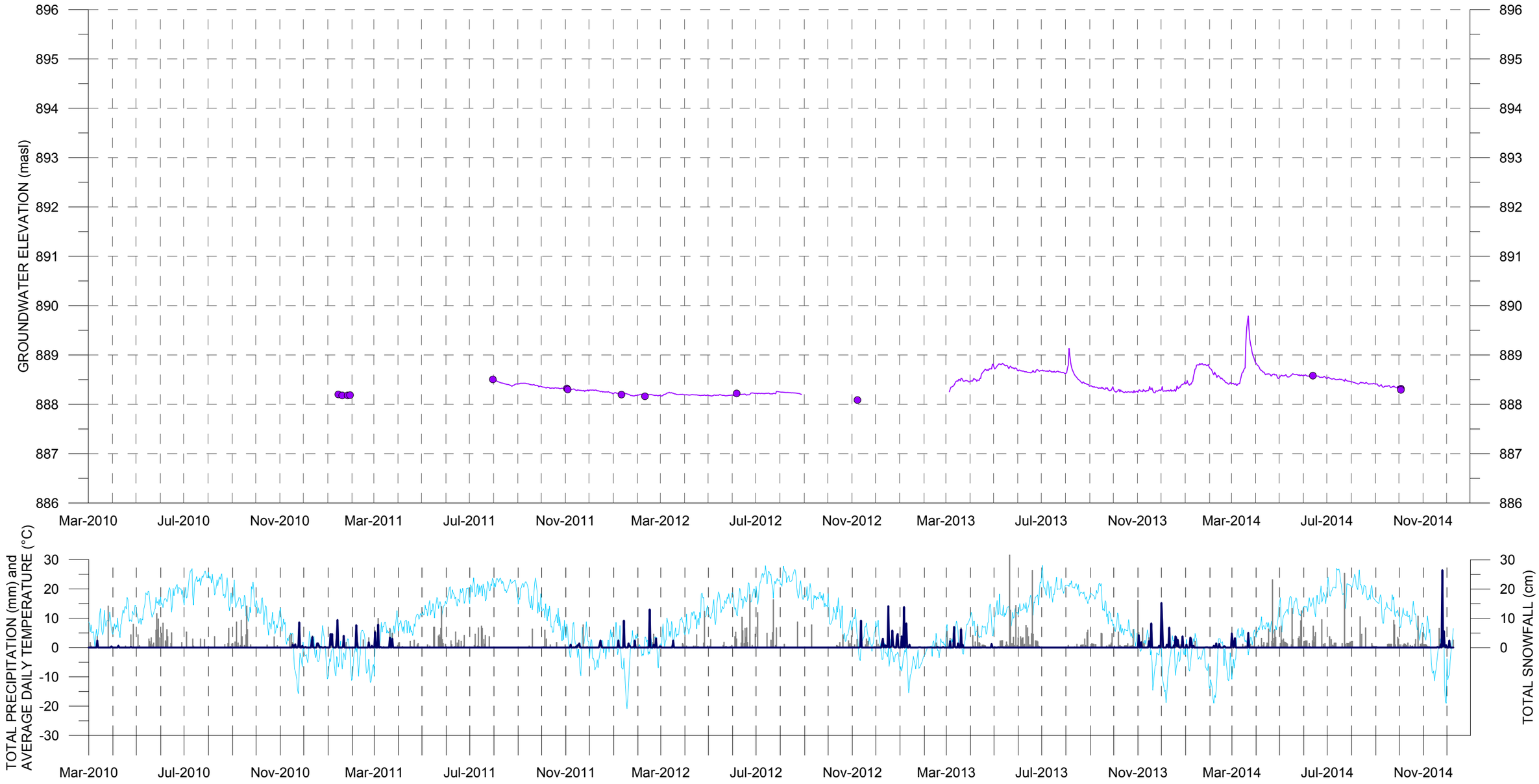


MONITORING INTERVAL DETAILS

	SCREEN INT. (M ASL)	COLLAR EL. (M ASL)	HSU
AJGW03-D	871 TO 875	897	FLUVIAL / GLACIOFLUVIAL

CLIMATE DATA

- Total Precipitation (mm)
- Total Snowfall (cm)
- Average Daily Temperature (°C)

WATER LEVEL DATA

- AJGW03-D
- MANUAL MEASUREMENT
- DATALOGGER

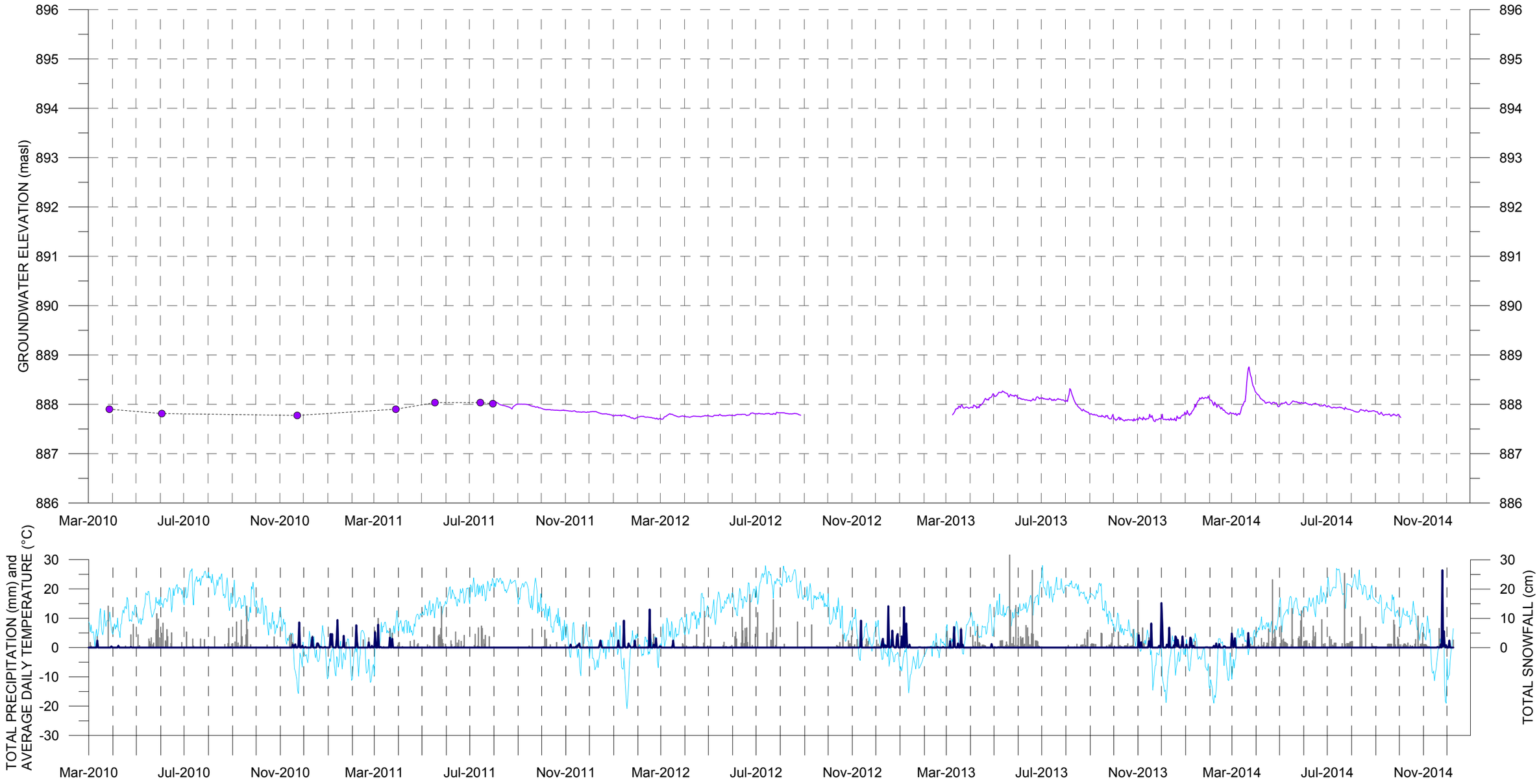
GENERAL MONITORING LOCATION

OPEN PIT AREA

NOTES:
1) WELL LOCATIONS SHOWN ON DRAWING 03; WELL COMPLETION DETAILS SUMMARIZED IN TABLE 1.
2) BOREHOLE LOGS INCLUDED IN APPENDIX A.
3) CLIMATE DATA FROM ENVIRONMENT CANADA, KAMLOOPS AIRPORT AND KAMLOOPS PRATT ROAD STATION (2014).
4) HSU = HYDROSTRATIGRAPHIC UNIT; VWP = VIBRATING WIRE PIEZOMETER; TSF = TAILINGS STORAGE FACILITY; EMRSF = EAST MINE ROCK STORAGE FACILITY; SMRSF = SOUTH MINE ROCK STORAGE FACILITY.

SCALE: AS SHOWN	DRAWN: CK	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY	PROJECT: AJAX PROJECT ENVIRONMENTAL ASSESSMENT BASELINE GROUNDWATER HYDROLOGY ASSESSMENT
DATE: AUG 2015	CHECKED: CK	KGHM AJAX MINING INC.	TITLE: AJGW03 GROUNDWATER ELEVATION TIME SERIES WITH METEOROLOGICAL DATA
PROJECT No.: 1125007-03	APPROVED: BM		FIG No.: G-33

C:\Exports\03_OPA_PIEZ_AJGW03.grf



MONITORING INTERVAL DETAILS

	SCREEN INT. (M ASL)	COLLAR EL. (M ASL)	HSU
AJGW04-D	861 TO 867	890	GLACIAL TILL

CLIMATE DATA

- Total Precipitation (mm)
- Total Snowfall (cm)
- Average Daily Temperature (°C)

WATER LEVEL DATA

- AJGW04-D
- MANUAL MEASUREMENT
- DATALOGGER

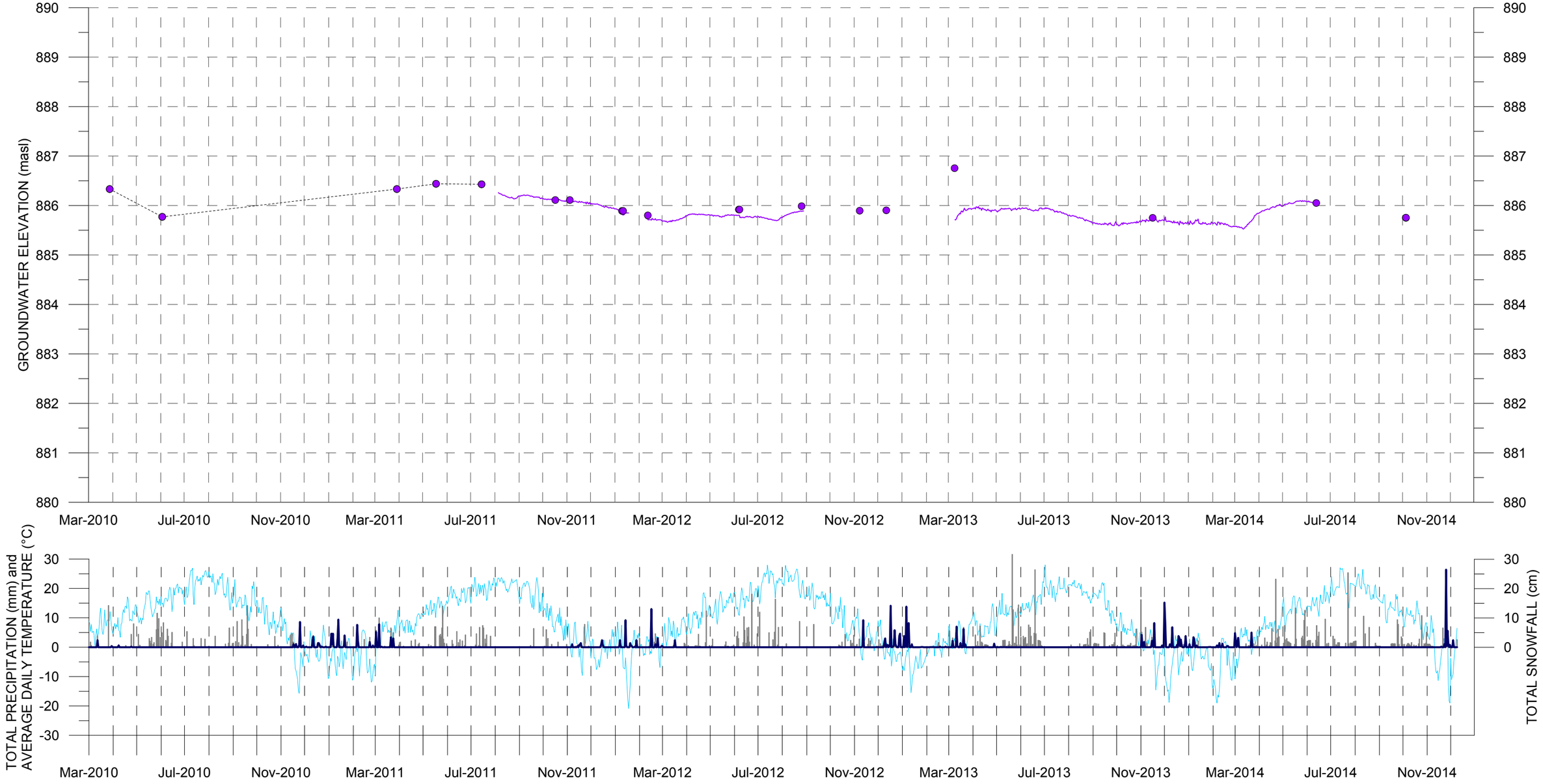
GENERAL MONITORING LOCATION

OPEN PIT AREA

NOTES:
1) WELL LOCATIONS SHOWN ON DRAWING 03; WELL COMPLETION DETAILS SUMMARIZED IN TABLE 1.
2) BOREHOLE LOGS INCLUDED IN APPENDIX A.
3) CLIMATE DATA FROM ENVIRONMENT CANADA, KAMLOOPS AIRPORT AND KAMLOOPS PRATT ROAD STATION (2014).
4) HSU = HYDROSTRATIGRAPHIC UNIT; VWP = VIBRATING WIRE PIEZOMETER; TSF = TAILINGS STORAGE FACILITY; EMRSF = EAST MINE ROCK STORAGE FACILITY; SMRSF = SOUTH MINE ROCK STORAGE FACILITY.

SCALE: AS SHOWN	DRAWN: CK	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY	PROJECT: AJAX PROJECT ENVIRONMENTAL ASSESSMENT BASELINE GROUNDWATER HYDROLOGY ASSESSMENT
DATE: AUG 2015	CHECKED: CK	KGHM AJAX MINING INC.	TITLE: AJGW04 GROUNDWATER ELEVATION TIME SERIES WITH METEOROLOGICAL DATA
PROJECT No.: 1125007-03	APPROVED: BM		FIG No.: G-34

C:\Exports\St_OPA_PIEZ_AJGW04.grf



MONITORING INTERVAL DETAILS

	SCREEN INT. (M ASL)	COLLAR EL. (M ASL)	HSU
AJGW05-S	871 TO 877	886	FLUVIAL / GLACIOFLUVIAL

CLIMATE DATA

- Total Precipitation (mm)
- Total Snowfall (cm)
- Average Daily Temperature (°C)

WATER LEVEL DATA

- AJGW05-S
- MANUAL MEASUREMENT
- DATALOGGER

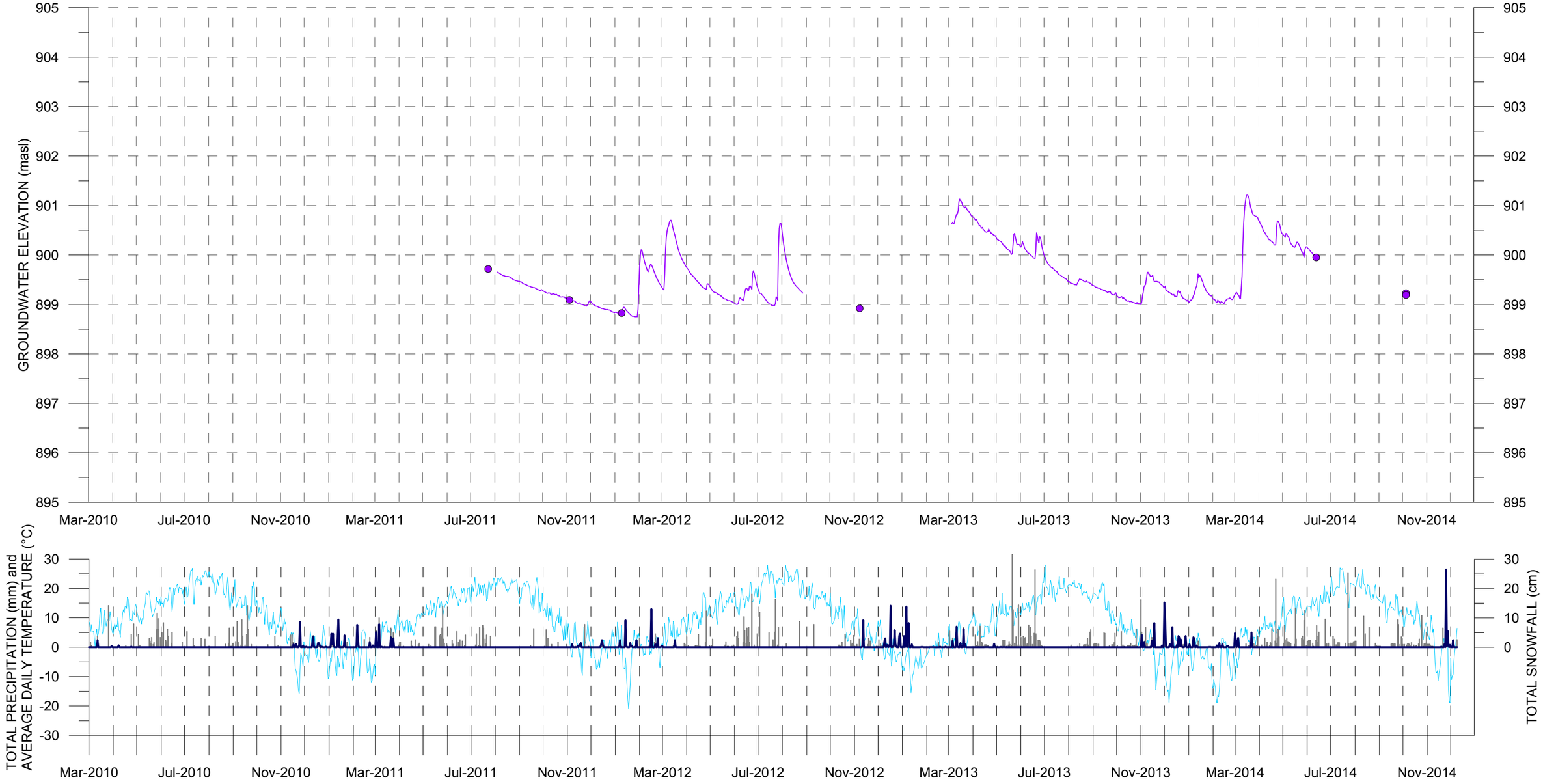
GENERAL MONITORING LOCATION

OPEN PIT AREA

NOTES:
1) WELL LOCATIONS SHOWN ON DRAWING 03; WELL COMPLETION DETAILS SUMMARIZED IN TABLE 1.
2) BOREHOLE LOGS INCLUDED IN APPENDIX A.
3) CLIMATE DATA FROM ENVIRONMENT CANADA, KAMLOOPS AIRPORT AND KAMLOOPS PRATT ROAD STATION (2014).
4) HSU = HYDROSTRATIGRAPHIC UNIT; VWP = VIBRATING WIRE PIEZOMETER; TSF = TAILINGS STORAGE FACILITY; EMRSF = EAST MINE ROCK STORAGE FACILITY; SMRSF = SOUTH MINE ROCK STORAGE FACILITY.

SCALE: AS SHOWN	DRAWN: CK	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY	PROJECT: AJAX PROJECT ENVIRONMENTAL ASSESSMENT BASELINE GROUNDWATER HYDROLOGY ASSESSMENT
DATE: AUG 2015	CHECKED: CK	KGHM AJAX MINING INC.	TITLE: AJGW05 GROUNDWATER ELEVATION TIME SERIES WITH METEOROLOGICAL DATA
PROJECT No.: 1125007-03	APPROVED: BM		FIG No.: G-35

C:\Exports\35_OPA_PIEZ_AJGW05.grf



MONITORING INTERVAL DETAILS

	SCREEN INT. (M ASL)	COLLAR EL. (M ASL)	HSU
AJGW06-D	871 TO 880	903	IRON MASK HYBRID

CLIMATE DATA

- Total Precipitation (mm)
- Total Snowfall (cm)
- Average Daily Temperature (°C)

WATER LEVEL DATA

- AJGW06-D
- MANUAL MEASUREMENT
- DATALOGGER

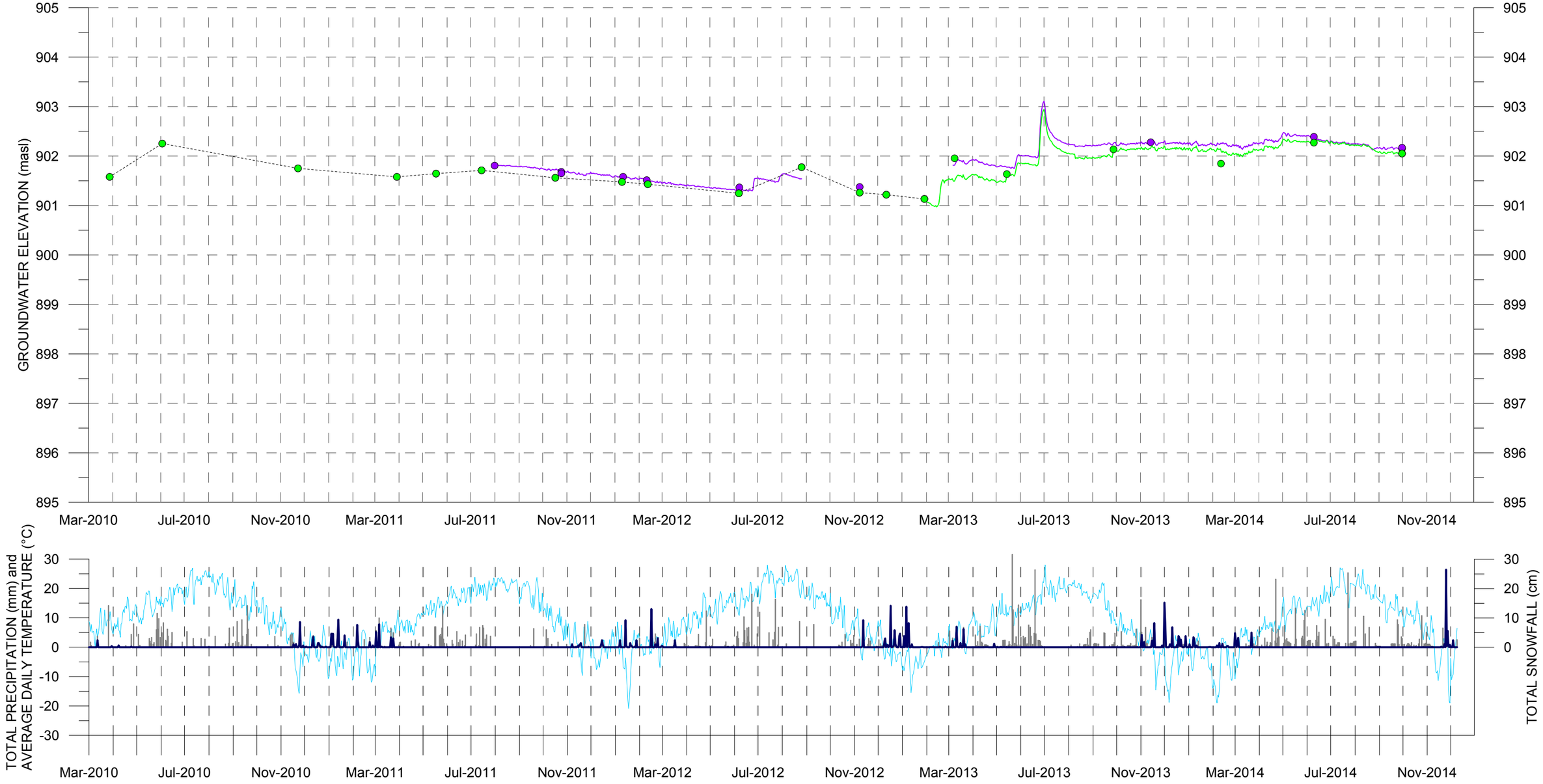
GENERAL MONITORING LOCATION

OPEN PIT AREA

NOTES:
1) WELL LOCATIONS SHOWN ON DRAWING 03; WELL COMPLETION DETAILS SUMMARIZED IN TABLE 1.
2) BOREHOLE LOGS INCLUDED IN APPENDIX A.
3) CLIMATE DATA FROM ENVIRONMENT CANADA, KAMLOOPS AIRPORT AND KAMLOOPS PRATT ROAD STATION (2014).
4) HSU = HYDROSTRATIGRAPHIC UNIT; VWP = VIBRATING WIRE PIEZOMETER; TSF = TAILINGS STORAGE FACILITY; EMRSF = EAST MINE ROCK STORAGE FACILITY; SMRSF = SOUTH MINE ROCK STORAGE FACILITY.

SCALE: AS SHOWN	DRAWN: CK	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY	PROJECT: AJAX PROJECT ENVIRONMENTAL ASSESSMENT BASELINE GROUNDWATER HYDROLOGY ASSESSMENT
DATE: AUG 2015	CHECKED: CK	KGHM AJAX MINING INC.	TITLE: AJGW06 GROUNDWATER ELEVATION TIME SERIES WITH METEOROLOGICAL DATA
PROJECT No.: 1125007-03	APPROVED: BM		FIG No.: G-36

C:\Exports\3b_OPA_PIEZ_AJGW06.grf



MONITORING INTERVAL DETAILS

	SCREEN INT. (M ASL)	COLLAR EL. (M ASL)	HSU
AJGW07-D	880 TO 886	909	NICOLA GROUP
AJGW07-S	891 TO 899	909	FLUVIAL / GLACIOFLUVIAL

CLIMATE DATA

- Total Precipitation (mm)
- Total Snowfall (cm)
- Average Daily Temperature (°C)

WATER LEVEL DATA

- AJGW07-D — DATALOGGER
- AJGW07-S • MANUAL MEASUREMENT

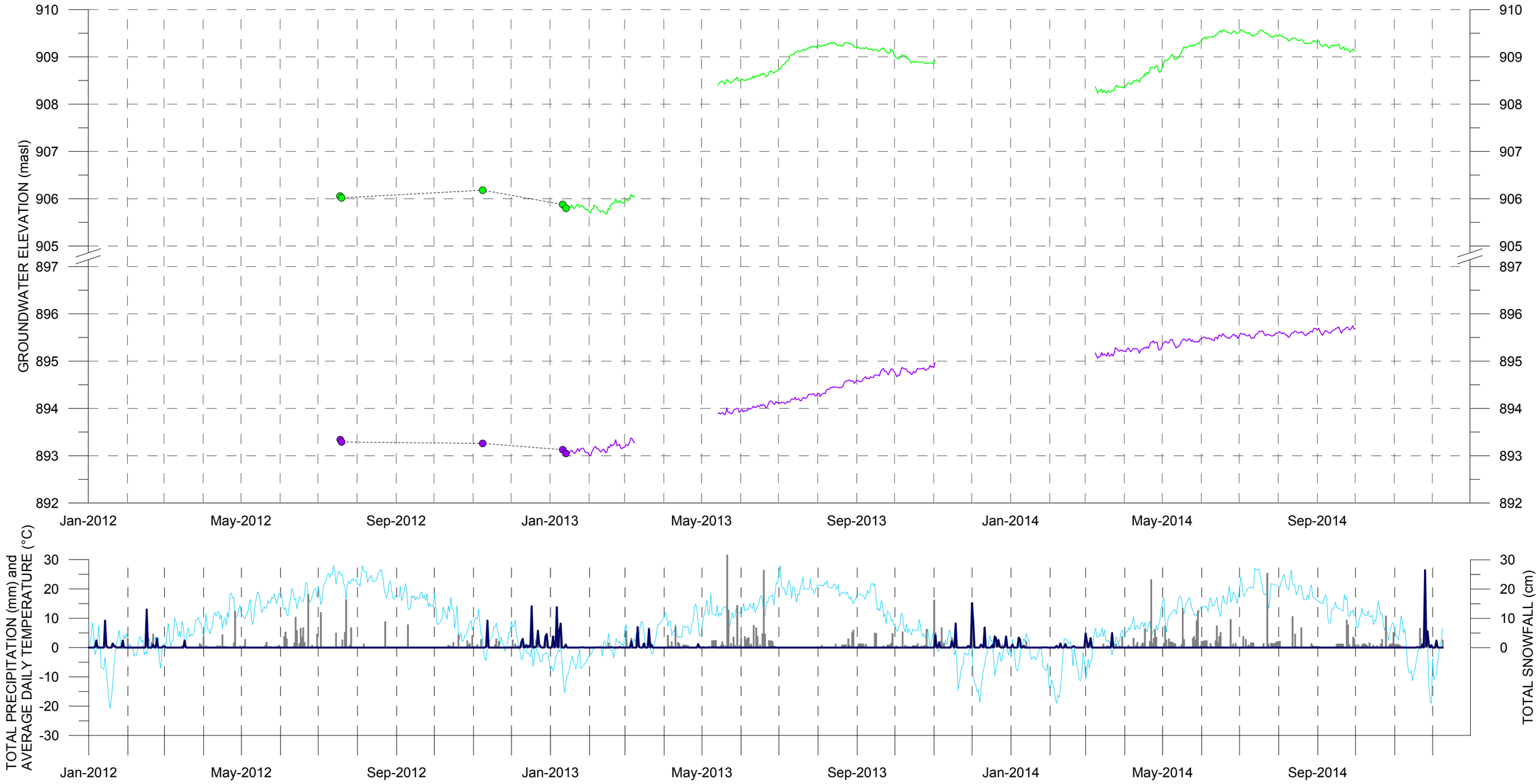
GENERAL MONITORING LOCATION

OPEN PIT AREA

NOTES:
1) WELL LOCATIONS SHOWN ON DRAWING 03; WELL COMPLETION DETAILS SUMMARIZED IN TABLE 1.
2) BOREHOLE LOGS INCLUDED IN APPENDIX A.
3) CLIMATE DATA FROM ENVIRONMENT CANADA, KAMLOOPS AIRPORT AND KAMLOOPS PRATT ROAD STATION (2014).
4) HSU = HYDROSTRATIGRAPHIC UNIT; VWP = VIBRATING WIRE PIEZOMETER; TSF = TAILINGS STORAGE FACILITY; EMRSF = EAST MINE ROCK STORAGE FACILITY; SMRSF = SOUTH MINE ROCK STORAGE FACILITY.

SCALE: AS SHOWN	DRAWN: CK	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY	PROJECT: AJAX PROJECT ENVIRONMENTAL ASSESSMENT BASELINE GROUNDWATER HYDROLOGY ASSESSMENT
DATE: AUG 2015	CHECKED: CK	KGHM AJAX MINING INC.	TITLE: AJGW07 GROUNDWATER ELEVATION TIME SERIES WITH METEOROLOGICAL DATA
PROJECT No.: 1125007-03	APPROVED: BM		FIG No.: G-37

C:\Exports\37_OPA_PIEZ_AJGW07.grf



MONITORING INTERVAL DETAILS

	VWP EL. (M ASL)	COLLAR EL. (M ASL)	HSU
AW-10-105-D	613	888	IRON MASK HYBRID
AW-10-105-S	774	888	IRON MASK HYBRID / SUGARLOAF DIORITE

CLIMATE DATA

- Total Precipitation (mm)
- Total Snowfall (cm)
- Average Daily Temperature (°C)

WATER LEVEL DATA

- AW-10-105-D
- AW-10-105-S
- DATALOGGER
- MANUAL MEASUREMENT

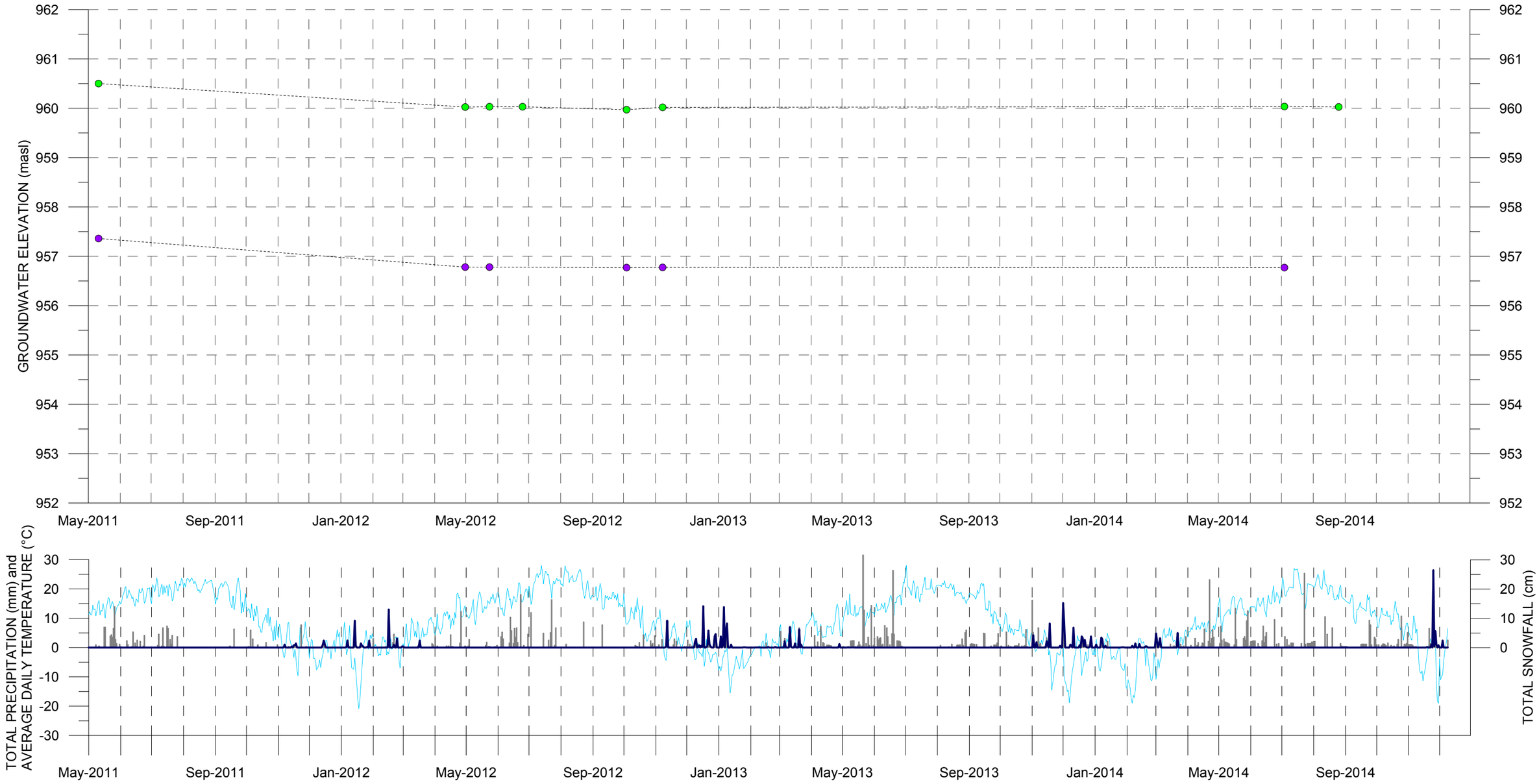
GENERAL MONITORING LOCATION

OPEN PIT AREA

NOTES:
1) WELL LOCATIONS SHOWN ON DRAWING 03; WELL COMPLETION DETAILS SUMMARIZED IN TABLE 1.
2) BOREHOLE LOGS INCLUDED IN APPENDIX A.
3) CLIMATE DATA FROM ENVIRONMENT CANADA, KAMLOOPS AIRPORT AND KAMLOOPS PRATT ROAD STATION (2014).
4) HSU = HYDROSTRATIGRAPHIC UNIT; VWP = VIBRATING WIRE PIEZOMETER; TSF = TAILINGS STORAGE FACILITY; EMRSF = EAST MINE ROCK STORAGE FACILITY; SMRSF = SOUTH MINE ROCK STORAGE FACILITY.

SCALE: AS SHOWN	DRAWN: CK	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY	PROJECT: AJAX PROJECT ENVIRONMENTAL ASSESSMENT BASELINE GROUNDWATER HYDROLOGY ASSESSMENT
DATE: AUG 2015	CHECKED: CK	KGHM AJAX MINING INC.	TITLE: AW-10-105 GROUNDWATER ELEVATION TIME SERIES WITH METEOROLOGICAL DATA
PROJECT No.: 1125007-03	APPROVED: BM		FIG No.: G-38

C:\Exports\3b_PIT_AREA_VW_AW-10-105.grf



MONITORING INTERVAL DETAILS

	SCREEN INT. (M ASL)	COLLAR EL. (M ASL)	HSU
DH-BGC11-WC-17	960 TO 962	978	GLACIAL TILL / WASTEROCK
DH-BGC11-WC-18	957 TO 958	960	GLACIAL TILL

CLIMATE DATA

- Total Precipitation (mm)
- Total Snowfall (cm)
- Average Daily Temperature (°C)

WATER LEVEL DATA

- DH-BGC11-WC-18
- DH-BGC11-WC-17

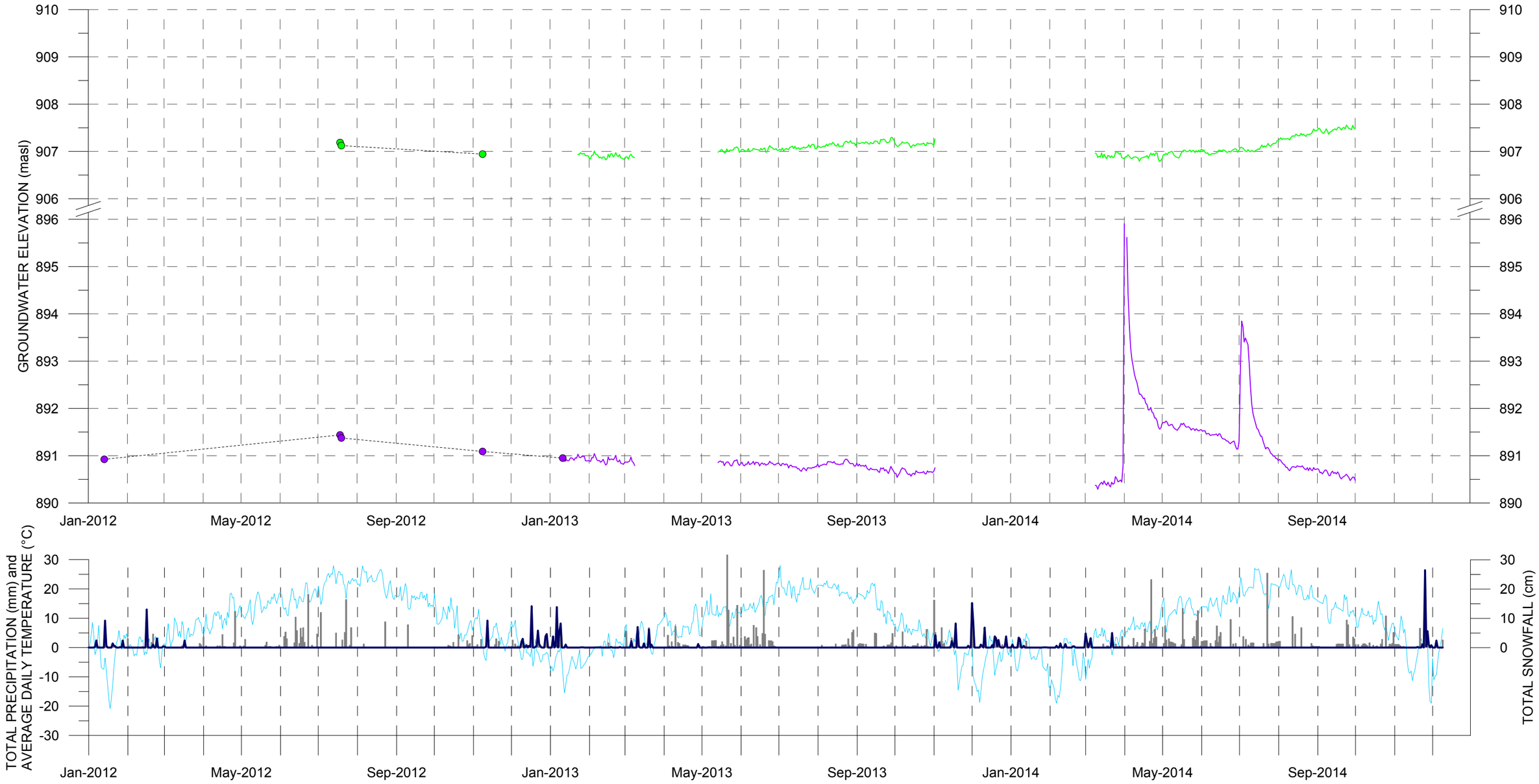
GENERAL MONITORING LOCATION

OPEN PIT AREA

NOTES:
1) WELL LOCATIONS SHOWN ON DRAWING 03; WELL COMPLETION DETAILS SUMMARIZED IN TABLE 1.
2) BOREHOLE LOGS INCLUDED IN APPENDIX A.
3) CLIMATE DATA FROM ENVIRONMENT CANADA, KAMLOOPS AIRPORT AND KAMLOOPS PRATT ROAD STATION (2014).
4) HSU = HYDROSTRATIGRAPHIC UNIT; VWP = VIBRATING WIRE PIEZOMETER; TSF = TAILINGS STORAGE FACILITY; EMRSF = EAST MINE ROCK STORAGE FACILITY; SMRSF = SOUTH MINE ROCK STORAGE FACILITY.

SCALE: AS SHOWN	DRAWN: CK	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY	PROJECT: AJAX PROJECT ENVIRONMENTAL ASSESSMENT BASELINE GROUNDWATER HYDROLOGY ASSESSMENT
DATE: AUG 2015	CHECKED: CK	KGHM AJAX MINING INC.	TITLE: DH-BGC11-WC-17 and 18 GROUNDWATER ELEVATION TIME SERIES WITH METEOROLOGICAL DATA
PROJECT No.: 1125007-03	APPROVED: BM		FIG No.: G-39

C:\Export\dib_PIT_PIEZ_DG-BGC11-WC-17_AND_18.grf



MONITORING INTERVAL DETAILS

	VWP EL. (M ASL)	COLLAR EL. (M ASL)	HSU
AM-10-061-D	582	950	SUGARLOAF DIORITE
AM-10-061S	762	950	PICRITE

CLIMATE DATA

- Total Precipitation (mm)
- Total Snowfall (cm)
- Average Daily Temperature (°C)

WATER LEVEL DATA

- AM-10-061-D — DATALOGGER
- AM-10-061-S • MANUAL MEASUREMENT

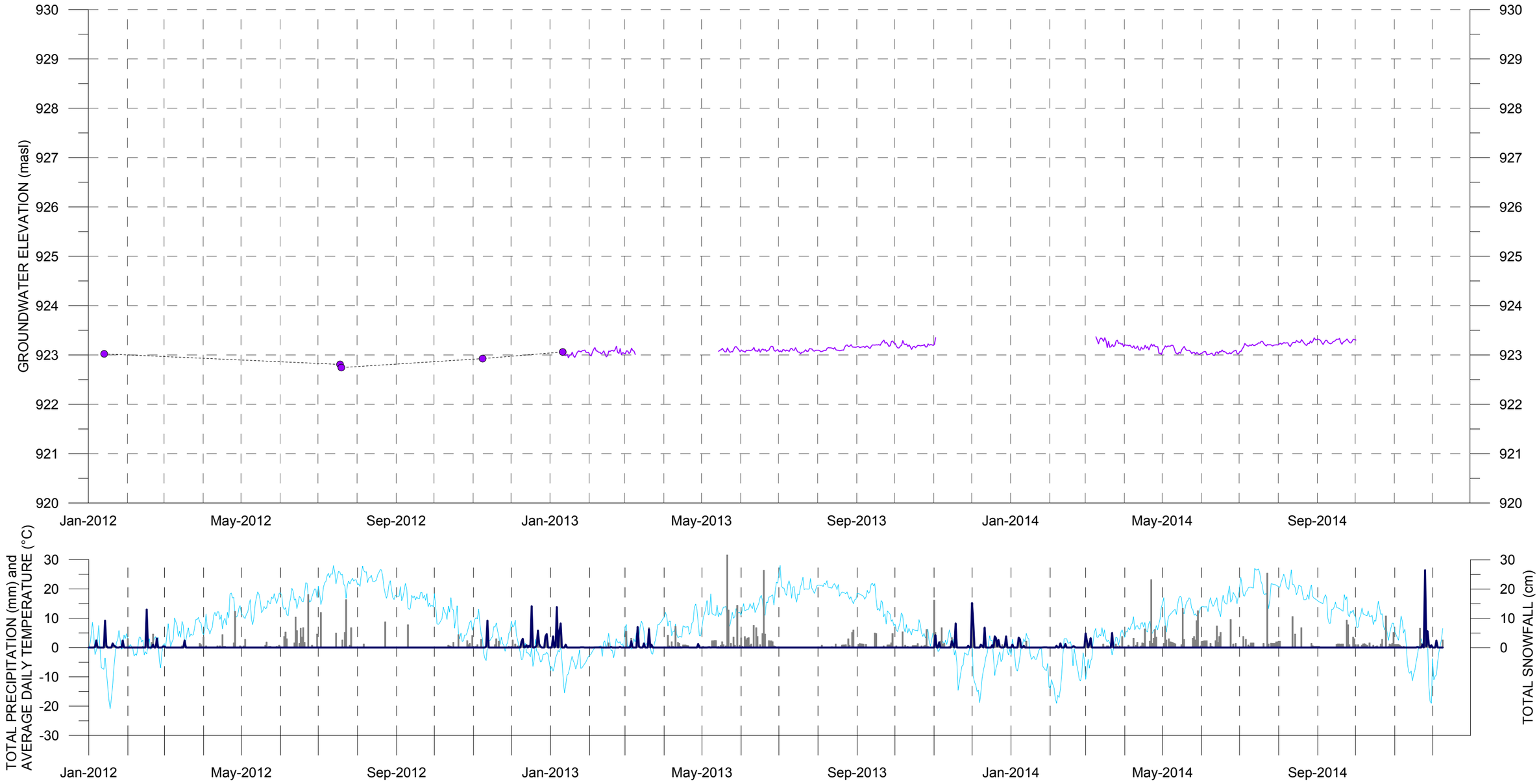
GENERAL MONITORING LOCATION

OPEN PIT EAST

NOTES:
1) WELL LOCATIONS SHOWN ON DRAWING 03; WELL COMPLETION DETAILS SUMMARIZED IN TABLE 1.
2) BOREHOLE LOGS INCLUDED IN APPENDIX A.
3) CLIMATE DATA FROM ENVIRONMENT CANADA, KAMLOOPS AIRPORT AND KAMLOOPS PRATT ROAD STATION (2014).
4) HSU = HYDROSTRATIGRAPHIC UNIT; VWP = VIBRATING WIRE PIEZOMETER; TSF = TAILINGS STORAGE FACILITY; EMRSF = EAST MINE ROCK STORAGE FACILITY; SMRSF = SOUTH MINE ROCK STORAGE FACILITY.

SCALE: AS SHOWN	DRAWN: CK	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY	PROJECT: AJAX PROJECT ENVIRONMENTAL ASSESSMENT BASELINE GROUNDWATER HYDROLOGY ASSESSMENT
DATE: AUG 2015	CHECKED: CK	KGHM AJAX MINING INC.	TITLE: AM-10-061 GROUNDWATER ELEVATION TIME SERIES WITH METEOROLOGICAL DATA
PROJECT No.: 1125007-03	APPROVED: BM		FIG No.: G-40

C:\Exports\40_PIT_EAST_VW_AM-10-061.grf



MONITORING INTERVAL DETAILS

	VWP EL. (M ASL)	COLLAR EL. (M ASL)	HSU
AE-10-064-D	516	920	SUGARLOAF DIORITE

CLIMATE DATA

- Total Precipitation (mm)
- Total Snowfall (cm)
- Average Daily Temperature (°C)

WATER LEVEL DATA

- AE-10-064-D
- DATALOGGER
- MANUAL MEASUREMENT

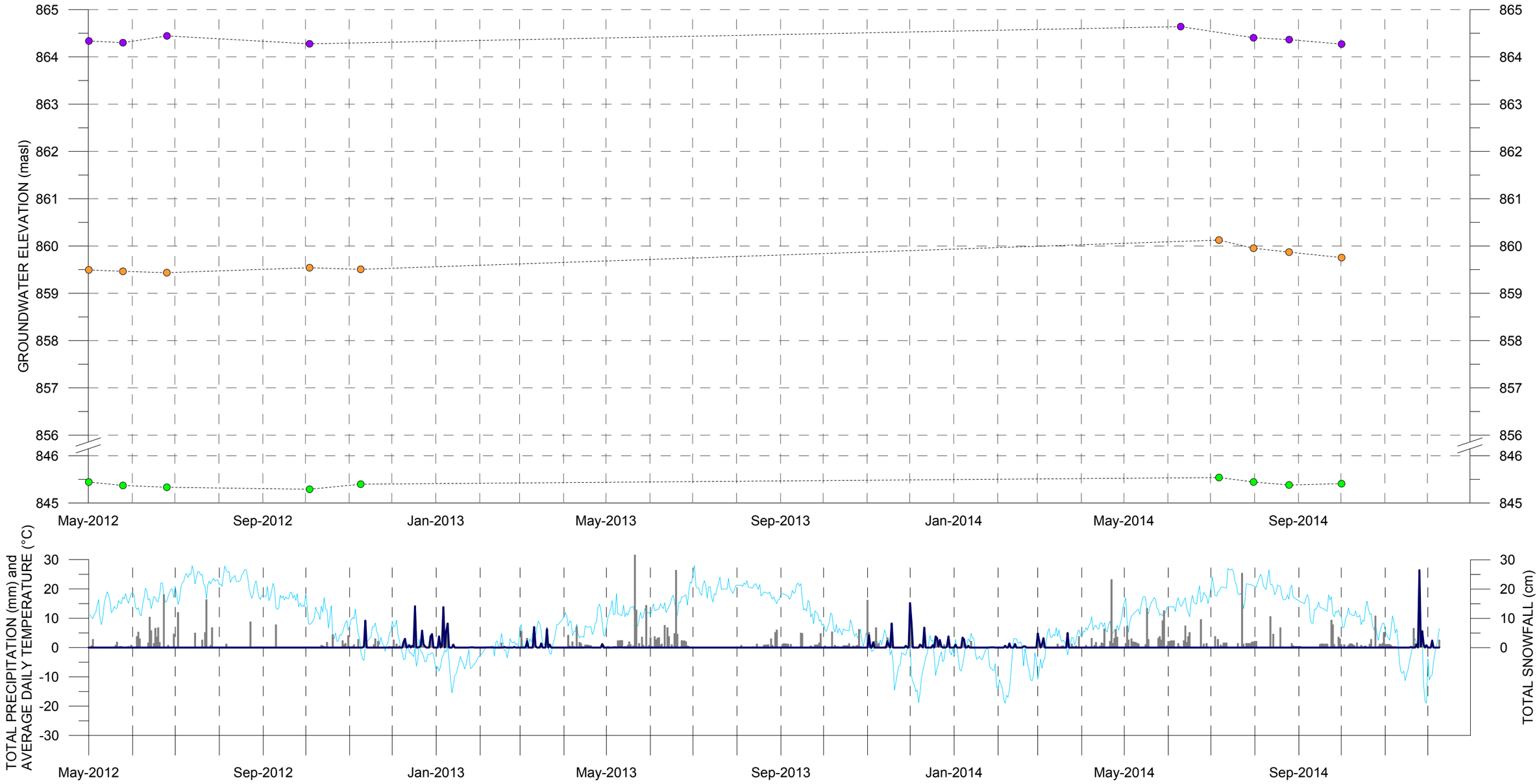
GENERAL MONITORING LOCATION

OPEN PIT NORTH WALL

NOTES:
1) WELL LOCATIONS SHOWN ON DRAWING 03; WELL COMPLETION DETAILS SUMMARIZED IN TABLE 1.
2) BOREHOLE LOGS INCLUDED IN APPENDIX A.
3) CLIMATE DATA FROM ENVIRONMENT CANADA, KAMLOOPS AIRPORT AND KAMLOOPS PRATT ROAD STATION (2014).
4) HSU = HYDROSTRATIGRAPHIC UNIT; VWP = VIBRATING WIRE PIEZOMETER; TSF = TAILINGS STORAGE FACILITY; EMRSF = EAST MINE ROCK STORAGE FACILITY; SMRSF = SOUTH MINE ROCK STORAGE FACILITY.

SCALE: AS SHOWN	DRAWN: CK	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY	PROJECT: AJAX PROJECT ENVIRONMENTAL ASSESSMENT BASELINE GROUNDWATER HYDROLOGY ASSESSMENT
DATE: AUG 2015	CHECKED: CK	KGHM AJAX MINING INC.	TITLE: AE-10-064 GROUNDWATER ELEVATION TIME SERIES WITH METEOROLOGICAL DATA
PROJECT No.: 1125007-03	APPROVED: BM		FIG No.: G-41

C:\Exports\41_PIT_N_WALL_VW_AE-10-064.grf



MONITORING INTERVAL DETAILS

	SCREEN INT. (M ASL)	COLLAR EL. (M ASL)	HSU
BH10-10	858 TO 861	873	KAMLOOPS GROUP
BH10-12	850 TO 853	863	GLACIAL TILL
BH10-11	831 TO 834	852	GLACIAL TILL

CLIMATE DATA

- Total Precipitation (mm)
- Total Snowfall (cm)
- Average Daily Temperature (°C)

WATER LEVEL DATA

- BH10-10
- BH10-12
- BH10-11

GENERAL MONITORING LOCATION

PROJECT SITE WEST

NOTES:
1) WELL LOCATIONS SHOWN ON DRAWING 03; WELL COMPLETION DETAILS SUMMARIZED IN TABLE 1.
2) BOREHOLE LOGS INCLUDED IN APPENDIX A.
3) CLIMATE DATA FROM ENVIRONMENT CANADA, KAMLOOPS AIRPORT AND KAMLOOPS PRATT ROAD STATION (2014).
4) HSU = HYDROSTRATIGRAPHIC UNIT; VWP = VIBRATING WIRE PIEZOMETER; TSF = TAILINGS STORAGE FACILITY; EMRSF = EAST MINE ROCK STORAGE FACILITY; SMRSF = SOUTH MINE ROCK STORAGE FACILITY.

SCALE: AS SHOWN	DRAWN: CK	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY	PROJECT: AJAX PROJECT ENVIRONMENTAL ASSESSMENT BASELINE GROUNDWATER HYDROLOGY ASSESSMENT
DATE: AUG 2015	CHECKED: CK	KGHM AJAX MINING INC.	TITLE: BH10-10, 11 AND 12 GROUNDWATER ELEVATION TIME SERIES WITH METEOROLOGICAL DATA
PROJECT No.: 1125007-03	APPROVED: BM		FIG No.: G-42

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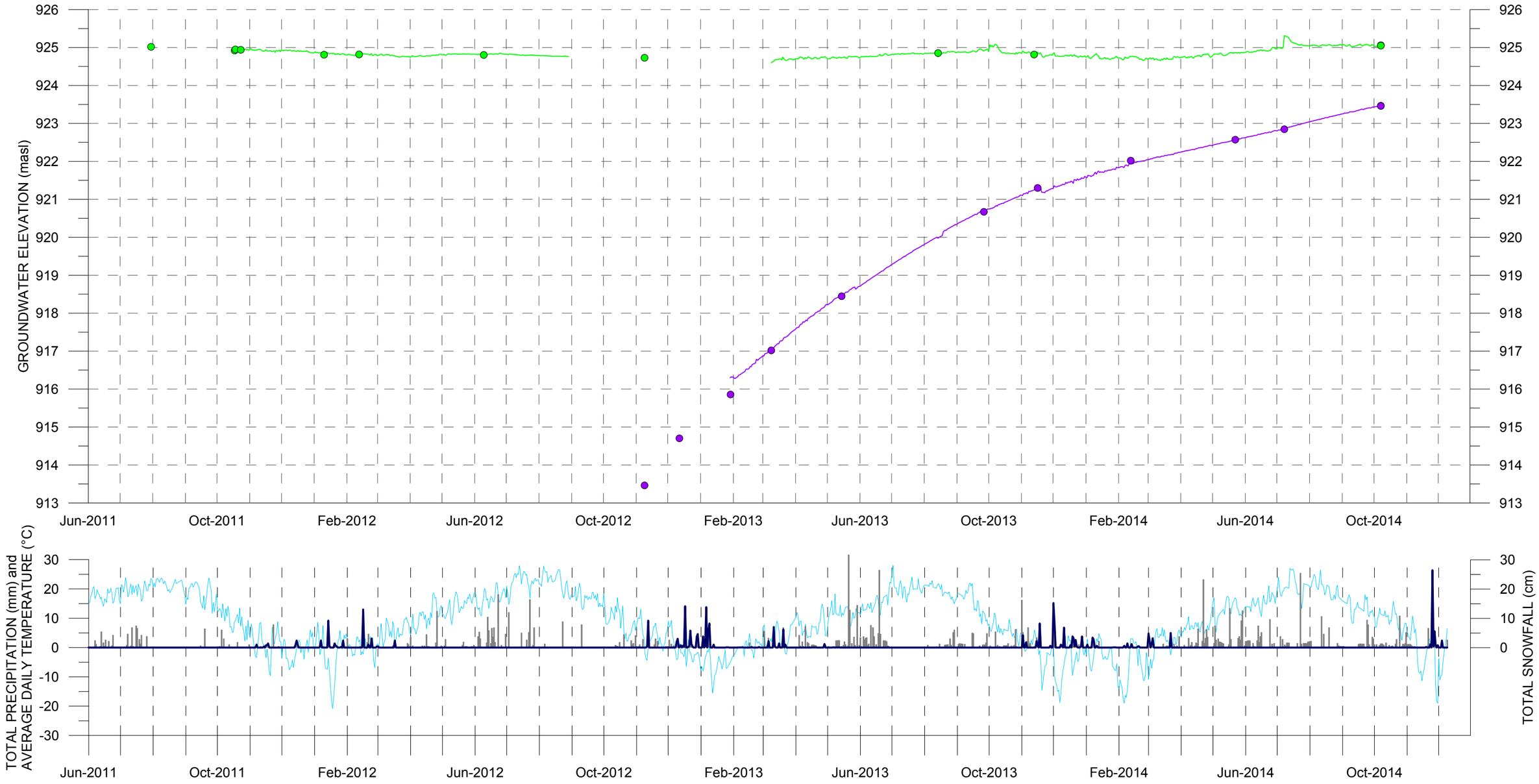

MONITORING INTERVAL DETAILS

	SCREEN INT. (M ASL)	COLLAR EL. (M ASL)	HSU
MW11-01D	874 TO 877	928	IRON MASK HYBRID
MW11-01S	905 TO 908	928	GLACIAL TILL

CLIMATE DATA

- Total Precipitation (mm)
- Total Snowfall (cm)
- Average Daily Temperature (°C)

WATER LEVEL DATA

- MW11-01D — DATALOGGER
- MW11-01S ● MANUAL MEASUREMENT

GENERAL MONITORING LOCATION

PROJECT SITE WEST

NOTES:
1) WELL LOCATIONS SHOWN ON DRAWING 03; WELL COMPLETION DETAILS SUMMARIZED IN TABLE 1.
2) BOREHOLE LOGS INCLUDED IN APPENDIX A.
3) CLIMATE DATA FROM ENVIRONMENT CANADA, KAMLOOPS AIRPORT AND KAMLOOPS PRATT ROAD STATION (2014).
4) HSU = HYDROSTRATIGRAPHIC UNIT; VWP = VIBRATING WIRE PIEZOMETER; TSF = TAILINGS STORAGE FACILITY; EMRSF = EAST MINE ROCK STORAGE FACILITY; SMRSF = SOUTH MINE ROCK STORAGE FACILITY.

SCALE: AS SHOWN	DRAWN: CK	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY	PROJECT: AJAX PROJECT ENVIRONMENTAL ASSESSMENT BASELINE GROUNDWATER HYDROLOGY ASSESSMENT
DATE: AUG 2015	CHECKED: CK	KGHM AJAX MINING INC.	TITLE: MW11-01 GROUNDWATER ELEVATION TIME SERIES WITH METEOROLOGICAL DATA
PROJECT No.: 1125007-03	APPROVED: BM		FIG No.: G-43

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MONITORING INTERVAL DETAILS

	SCREEN INT. (M ASL)	COLLAR EL. (M ASL)	HSU
MW11-02	813 TO 816	855	NICOLA GROUP

CLIMATE DATA

- Total Precipitation (mm)
- Total Snowfall (cm)
- Average Daily Temperature (°C)

WATER LEVEL DATA

- MW11-02
- MANUAL MEASUREMENT
- DATALOGGER

GENERAL MONITORING LOCATION

PROJECT SITE WEST

NOTES:
1) WELL LOCATIONS SHOWN ON DRAWING 03; WELL COMPLETION DETAILS SUMMARIZED IN TABLE 1.
2) BOREHOLE LOGS INCLUDED IN APPENDIX A.
3) CLIMATE DATA FROM ENVIRONMENT CANADA, KAMLOOPS AIRPORT AND KAMLOOPS PRATT ROAD STATION (2014).
4) HSU = HYDROSTRATIGRAPHIC UNIT; VWP = VIBRATING WIRE PIEZOMETER; TSF = TAILINGS STORAGE FACILITY; EMRSF = EAST MINE ROCK STORAGE FACILITY; SMRSF = SOUTH MINE ROCK STORAGE FACILITY.

SCALE: AS SHOWN	DRAWN: CK	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY	PROJECT: AJAX PROJECT ENVIRONMENTAL ASSESSMENT BASELINE GROUNDWATER HYDROLOGY ASSESSMENT
DATE: AUG 2015	CHECKED: CK	KGHM AJAX MINING INC.	TITLE: MW11-02 GROUNDWATER ELEVATION TIME SERIES WITH METEOROLOGICAL DATA
PROJECT No.: 1125007-03	APPROVED: BM		FIG No.: G-44

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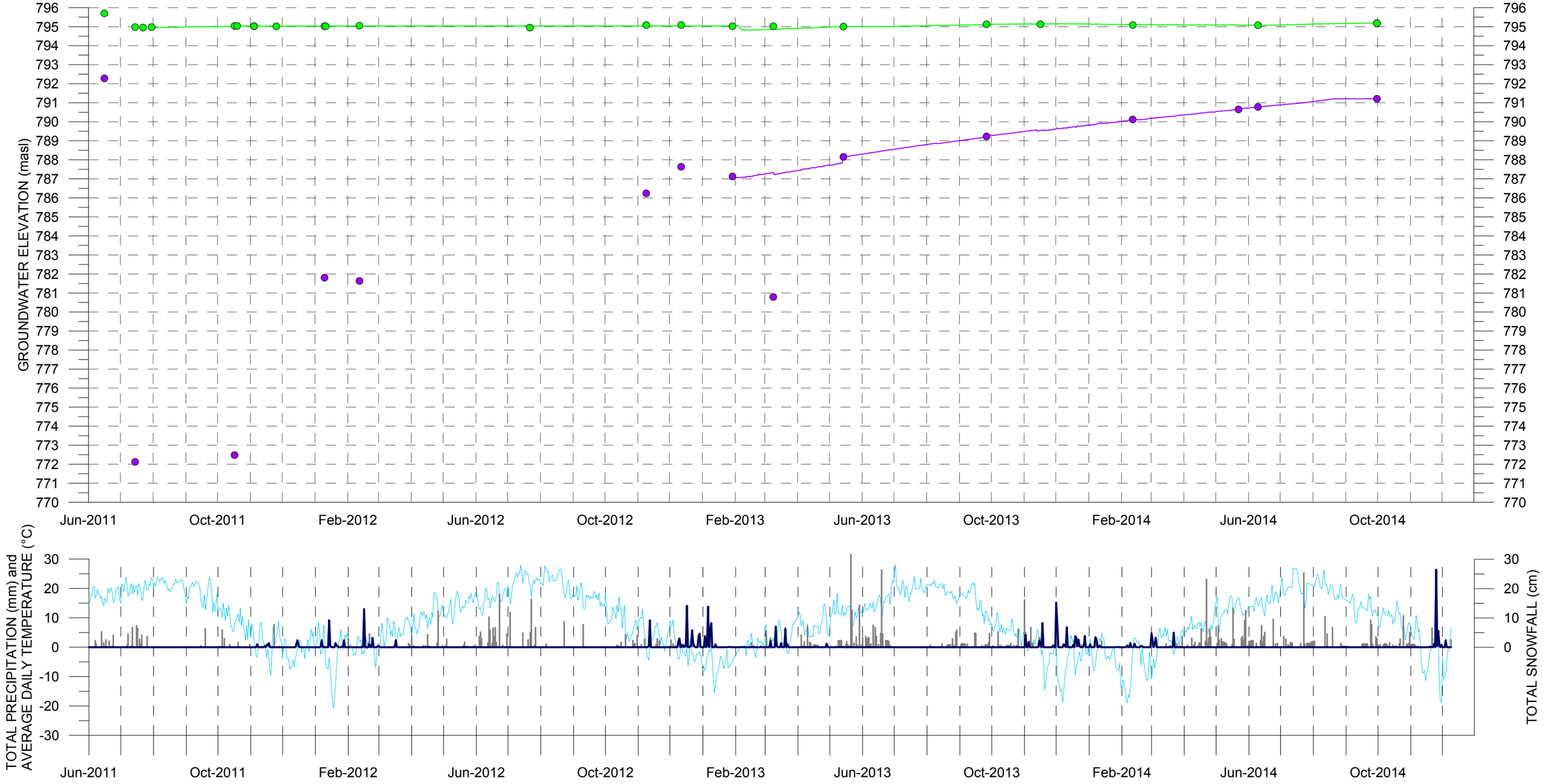

MONITORING INTERVAL DETAILS

	SCREEN INT. (M ASL)	COLLAR EL. (M ASL)	HSU
MW11-03D	771 TO 774	812	NICOLA GROUP
MW11-03S	795 TO 798	812	GLACIAL TILL

CLIMATE DATA

- Total Precipitation (mm)
- Total Snowfall (cm)
- Average Daily Temperature (°C)

WATER LEVEL DATA

- MW11-03D — DATALOGGER
- MW11-03S • MANUAL MEASUREMENT

GENERAL MONITORING LOCATION

PROJECT SITE WEST

NOTES:
1) WELL LOCATIONS SHOWN ON DRAWING 03; WELL COMPLETION DETAILS SUMMARIZED IN TABLE 1.
2) BOREHOLE LOGS INCLUDED IN APPENDIX A.
3) CLIMATE DATA FROM ENVIRONMENT CANADA, KAMLOOPS AIRPORT AND KAMLOOPS PRATT ROAD STATION (2014).
4) HSU = HYDROSTRATIGRAPHIC UNIT; VWP = VIBRATING WIRE PIEZOMETER; TSF = TAILINGS STORAGE FACILITY; EMRSF = EAST MINE ROCK STORAGE FACILITY; SMRSF = SOUTH MINE ROCK STORAGE FACILITY.

SCALE: AS SHOWN	DRAWN: CK	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY	PROJECT: AJAX PROJECT ENVIRONMENTAL ASSESSMENT BASELINE GROUNDWATER HYDROLOGY ASSESSMENT
DATE: AUG 2015	CHECKED: CK	KGHM AJAX MINING INC.	TITLE: MW11-03 GROUNDWATER ELEVATION TIME SERIES WITH METEOROLOGICAL DATA
PROJECT No.: 1125007-03	APPROVED: BM		FIG No.: G-45

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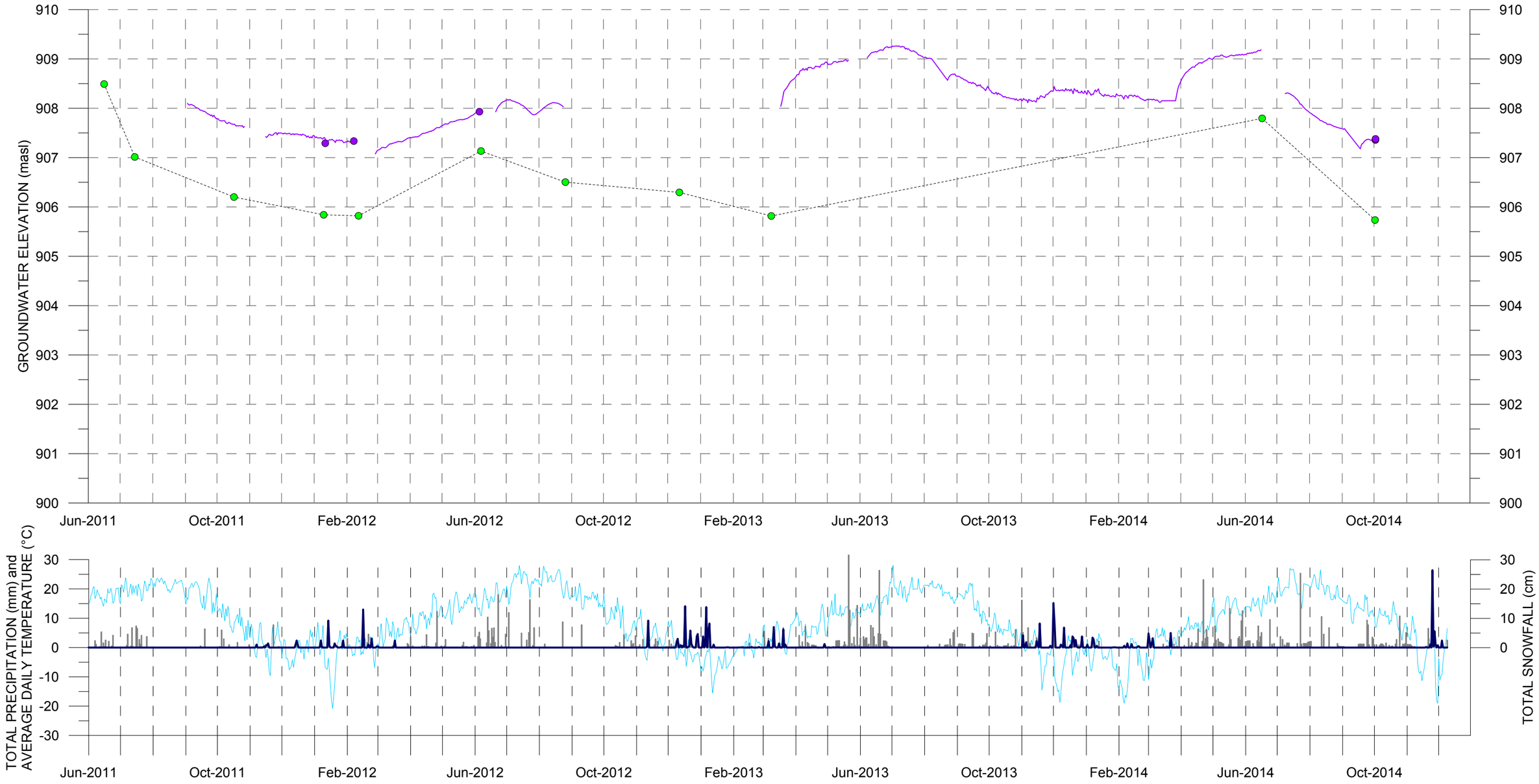

MONITORING INTERVAL DETAILS

	SCREEN INT. (M ASL)	COLLAR EL. (M ASL)	HSU
MW11-09D	880 TO 881	910	NICOLA GROUP
MW11-09S	895 TO 898	910	NICOLA GROUP

CLIMATE DATA

- Total Precipitation (mm)
- Total Snowfall (cm)
- Average Daily Temperature (°C)

WATER LEVEL DATA

- MW11-09D — DATALOGGER
- MW11-09S — MANUAL MEASUREMENT

GENERAL MONITORING LOCATION

PROJECT SITE WEST

NOTES:
1) WELL LOCATIONS SHOWN ON DRAWING 03; WELL COMPLETION DETAILS SUMMARIZED IN TABLE 1.
2) BOREHOLE LOGS INCLUDED IN APPENDIX A.
3) CLIMATE DATA FROM ENVIRONMENT CANADA, KAMLOOPS AIRPORT AND KAMLOOPS PRATT ROAD STATION (2014).
4) HSU = HYDROSTRATIGRAPHIC UNIT; VWP = VIBRATING WIRE PIEZOMETER; TSF = TAILINGS STORAGE FACILITY; EMRSF = EAST MINE ROCK STORAGE FACILITY; SMRSF = SOUTH MINE ROCK STORAGE FACILITY.

SCALE: AS SHOWN	DRAWN: CK	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY	PROJECT: AJAX PROJECT ENVIRONMENTAL ASSESSMENT BASELINE GROUNDWATER HYDROLOGY ASSESSMENT
DATE: AUG 2015	CHECKED: CK	KGHM AJAX MINING INC.	TITLE: MW11-09 GROUNDWATER ELEVATION TIME SERIES WITH METEOROLOGICAL DATA
PROJECT No.: 1125007-03	APPROVED: BM		FIG No.: G-46

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APPENDIX H
HYDRAULIC CONDUCTIVITY TESTING METHODS

APPENDIX H
HYDRAULIC CONDUCTIVITY TESTING METHODS IN THE AJAX AREA AND NEAR THE NEW AFTON MINE

A variety of testing methods have been employed by BGC and others to obtain estimates of hydraulic conductivity within overburden and bedrock materials in the Ajax RSA. These methods include rising and falling head (slug), packer, pumping and pump-in tests. Testing and analysis methods are described below. Curve fits and calculation sheets are included within the reports referenced herein.

1.0 SLUG (RISING AND FALLING HEAD) TESTS

Slug tests, also known as rising and falling head tests, involve bailing water from, or adding water to the well and measuring the resulting water level recovery time in order to assess the saturated hydraulic conductivity of the materials intersected by the well screens.

Slug tests were carried out by BGC, Knight Piesold (KP), Klohn Leonoff and Golder Associates (BGC 2015a, Knight Piesold 2007, 2011, Golder Associates 2011, Klohn Leonoff 1988) in monitoring wells to obtain estimates of the hydraulic conductivity of overburden and shallow bedrock materials on the Ajax property. Piteau Associates also carried out slug tests in monitoring wells at the Afton mine (Piteau Associates, 2006).

The guidelines for analyses of slug tests prescribed by Butler (1998) were used to help select the appropriate analytical method for interpretation of well response data for the tests conducted by BGC (2015a). In general, the KGS (Hyder et al. 1994) unconfined solution for wells screened below the water table was used to estimate hydraulic conductivity (K) and, where appropriate, the aquifer storage coefficient (S), (i.e., in cases where S was not implausibly low for the materials being tested). The Hvorslev (1951) unconfined method was used to estimate K from test data where a reasonable match to the KGS (1998) solution could not be obtained. The Cooper et al. (1967) analytical solution for a confined aquifer was used for the analysis of test data from monitoring wells that were artesian.

In 2014, BGC drilled a total of 29 boreholes for a groundwater monitoring program to support the Ajax project Environmental Assessment (EA). Slug tests were conducted in the majority of wells using solid slugs constructed of 0.04 m (1.5-inch) or 0.05 m (2-inch) diameter PVC pipe filled with sand and capped at both ends. Water level recovery was monitored using data loggers and a water level tape. Both falling head and rising head tests were carried out in each of the wells tested with solid slugs. Single rising head hydraulic tests were conducted in a number of wells (i.e., BGC14-006S, 008D, 014D, 015S, 017S and 017D) due to long water level recovery times. Slug tests were not completed in BGC14-001S, 007S, 007D, 008S and 014S as these wells were dry (or water levels were near the well screen bottom) during the field monitoring program. Slug tests were also completed in the two wells installed by KCB (KAX-14-114 and 128S), at the request of KAM.

KP (2007, 2011) conducted five (5) slug tests in monitoring wells in the planned open pit area (i.e. AJGW01-D, 04-D, 06-D, 07-D and 07-S), four (4) tests in monitoring wells near the

planned EMRSF (i.e. MW11-05D, 05S, 10D and 10S), four (4) tests in monitoring wells located north of Jacko Lake (i.e. MW11-04D, 04S, 07D and 07S), six (6) tests in monitoring wells west of the proposed Ajax Mine (MW11-01S, 01D, 02, 03D, 09S and 09D), and one (1) test in a monitoring well south of Jacko Lake (MW11-08D). Test data collected by KP were analyzed using the Cooper et al. (1967) and/or the Hvorslev (1951) methods; wells exhibiting an oscillating (under damped response) were analyzed using the Van der Kamp (1976) method.

Golder (2011) conducted four (4) slug tests in monitoring wells west of the proposed Ajax Mine (BH10-9, 10, 11 and 12). Test data collected by Golder were analyzed using the Hvorslev (1951) method.

Klohn Leonoff (1988) conducted slug tests in conjunction with a Water Management Study for the proposed mine development. Six (6) slug tests were completed in monitoring wells, and eight (8) falling head tests were completed in open boreholes. The tests were analyzed using Hvorslev (1951), Zangar (1953), and La Croix (1960).

Piteau Associates (2006) conducted eighteen (18) slug tests in monitoring wells offsite, near the Afton Mine.

Slug test results are summarized in Table 2 of the main report.

2.0 PACKER TESTS

Packer testing is a method for obtaining hydraulic conductivity estimates in rock, and may be performed using a single or double packer set-up. Either constant head (i.e. constant pressure), falling head (i.e. slug test), or flow recession packer tests can be performed. Constant head packer tests are the preferred test, because information can be gained for both the hydraulic conductivity of the tested interval and fracture behavior of the rock.

Packer tests were carried out by BGC, Klohn Crippen Berger (KCB), Piteau Associates, and Klohn Leonoff (BGC 2011a, KCB 2014, Piteau Associates 2006, Klohn Leonoff 1988). Packer test intervals were selected to provide estimates of the hydraulic conductivity at lithological contacts, zones with low/high air lift yield flows and permeability; and the Picrite, Sugarloaf Diortie, and Nicola Volcanics bedrock units.

The general procedure for conducting a packer test involves isolation of a predetermined test interval within a borehole by lowering packers down the hole inside drill rods to the drill bit and inflating them with nitrogen gas or water. The test zone is isolated between two packers extended below the drill rods in a two packer system, and a single packer extended below the drill rods and the bottom of the hole in a single packer system. In a constant rate test, a constant pressure head is applied to the test interval and maintained using a pump typically located at the surface after the interval is isolated. A flow totalizer is used to record the volume of water that is pumped during each test over a given period of time (generally 5 to 10 minutes per pressure stage). The bulk hydraulic conductivity across the test interval may then be estimated using a formula involving the applied pressure differential, the observed steady-state flow rate, and an empirical shape factor based on the geometry of the test interval.

A falling head test may be utilized if the hydraulic conductivity is found to be too low to perform a constant head test (i.e. hydraulic conductivity less than ~$1x10^{-8}$ m/s at which flows are generally too low for measurement using the commercially available, non-specialized, flow meters typical for this type of assessment). This type of test involves the addition of water to a predetermined level within the drill rods and recording the rate at which the water level drops, and is essentially identical to the procedure described in Section 3.2.4.1.

A flow recession test may be performed if the sealed packer interval is found to be flowing artesian. For this test, the artesian interval is sealed and the pressure buildup with respect to time is recorded. After the pressure has stabilized, the interval is unsealed and the discharge rate monitored until pressure in the interval returns to pre-test conditions.

BGC conducted packer tests (constant rate and falling head) in several geotechnical and one exploration borehole drilled at the property (BGC 2011a). During the summer of 2009, ten (10) packer tests were carried out in two geotechnical boreholes (i.e. AW-109-103, AW-109-104) and one exploration borehole (AW-08-074) as part of the project pre-feasibility assessment. Forty-four (44) additional packer tests were completed by BGC during 2010 in nine (9) of the geotechnical holes drilled that year (i.e. AE-10-064 and 065, AM-10-054, 061 and 067, AN-10-075, AW-10-105, 106 and 118). Tests conducted in the geotechnical holes and the exploration hole during 2009 used a double packer system, and the tests conducted in the geotechnical holes during 2010 used a single packer system. Falling head packer tests conducted within the bedrock units were assessed using the Hvorslev (1951) method.

KCB (2014) completed forty-eight (48) packer tests at varying depths in seven (7) boreholes. Packer testing was completed using a SWiPS packer system adaptable for PQ and HQ hole diameters. A single packer assembly was used during drilling for open hole packer testing over larger intervals, and a double packer assembly (straddle packer) was used after completion of the drillhole to target key intervals. The straddle packer was limited to a maximum span of approximately 10m.

Piteau Associates (2006) conducted three (3) packer tests using a single packer system within a borehole near the old Afton Mine. The borehole was reported to exhibit artesian conditions during the tests. All tests were conducted within bedrock (i.e. Nicola Volcanics) and test data were interpreted using a method described by Cedegren (1989).

Klohn Leonoff (1988) completed four (4) packer tests as part of a Water Management Study for the proposed mine development. The tests were used to estimate hydraulic conductivity values in the Nicola Volcanics bedrock.

A summary of estimated hydraulic conductivity values from packer tests is provided in Table 2 of the main report.

3.0 PUMPING TESTS

Pumping tests are a method of parameter measurement that is suited to determine hydraulic conductivity (K) and the aquifer storage coefficient (S) in confined and unconfined aquifers at the Mine Site scale. Whereas slug and packer tests provide in-situ hydrogeological parameters

of a small volume of porous media in the immediate vicinity of a well screen or packer test interval, pumping tests provide in-situ measurements that are averaged over a large aquifer volume (Freeze and Cherry 1979). The general procedure for performing a pumping test is to:

1. Drill, install, and develop a pumping well with one or more monitoring wells
2. Conduct a step rate discharge test, where the pumping rate is incrementally increased at the pumping well over a fixed interval of time (i.e., 30 minutes of pumping at 5 gpm, 10 gpm, 15 gpm, and 20 gpm), while observing the drawdown in the pumping well to determine the optimum pumping rate for the constant-rate pumping test
3. Conduct a constant rate discharge test, where the pumping rate is fixed at a constant rate over a period of time (i.e. typically between 3 to 10 days), while drawdown is observed at the pumping and monitoring wells.

Two methods that are commonly used to assess the time-drawdown data from a constant-rate pumping test are the Theis (1935) and Cooper-Jacob (1946) methods. The Theis method involves curve matching on a log-log plot, while the Cooper & Jacob method involves interpretations with a semilog plot. BGC performed two constant-rate pumping tests, one targeting the bedrock zone between Jacko Lake and the proposed open pit (BGC 2011b) and the other targeting the Peterson Creek Aquifer (BGC 2015b).

3.1. BGC 2011 Bedrock Pumping Test

BGC performed a constant rate discharge test in January 2011 to collect hydrogeological data from the upper 200 m of bedrock near the western limit of the proposed open pit. The pumping test was conducted in close proximity to Jacko Lake in order to assess the significance of the lake as a potential recharge boundary (see Section 10). Another purpose of the investigation at that time was to assess the potential for depressurizing open pit slopes using groundwater wells.

The pumping well (BGC10-PW01) was constructed of 127 mm (5 in) dia. (114.3 mm or 4.5 in ID) SCH 40 PVC casing. Blank PVC was installed in this hole to a depth of 33.5 m (110 ft), and the remaining 176 m (577 ft) is lined with factory-slotted (0.020 in) PVC pipe, with an end cap installed at the well bottom. The annulus of the borehole was left open to the formation.

Two VWP observation nests were installed for the pumping test. The observation nests were completed by installing RST VW2100 VWPs at three depth intervals (i.e. 75 m, 125 m and 175 m) into boreholes BGC10-MWA and MWB. Each VWP cable was connected to a 10-channel datalogger at ground surface for response monitoring during the pumping test During the test, groundwater levels were also monitored manually in seven additional VWPs (AW-09-103-S, 103-D and 104, AW-10-105-S, 105-D, and 106, AE-10-065) and seven monitoring wells (AJGW01-D, 02-S, 02-D, 03-D, 04-D, 07-S and 07-D) at the site.

A step rate discharge test was conducted and consisted of three pumping steps at decreasing discharge rates of 40, 14, and 11 US gpm. The pumping steps were 10, 266, and 1620 minutes, respectively. The duration of each period was limited by a maximum available drawdown of about 168 m (550ft) in order to maintain 3 m (10 feet) of head above the pump

intake at 193 m (634 ft) below ground surface, and also to avoid developing excessive pressure build up in the flow manifold. Recovery of the water level was monitored in the pumping well following each pumping step.

A submersible pump was deployed in the pumping well at a depth of 112 m for the constant rate discharge test. The steady-state pumping rate during the test was approximately 8.5 US gpm over 7.5 days. The total discharge volume was determined by calculating pumped volumes over rate measurement periods from a flow meter installed at the well head and summing these volumes over the test duration.

Upon termination of pumping, recovery of groundwater levels was monitored in the pumping and observation wells. The results from test pumping were used to provide additional, larger scale estimates of rock mass hydraulic conductivity near the pumping well and other points at which a drawdown response was observed/interpreted (i.e. BGC10-PW01, BGC10-MWA-075, 125, and 175, BGC10-MWB-025, 125 and-175, AW-09-103-S and 104 and AJGW02-S).

Estimates of hydrogeological parameters were made using drawdown data from the step rate and constant rate discharge tests, as well as recovery monitoring data. Hydraulic conductivity and storage coefficient were determined from the step rate discharge test drawdown and recovery data using the Neuman (1974) solution for unconfined aquifers. Constant rate discharge test data were analyzed using the Cooper-Jacob (1946) solution where valid and the Theis (1935) solution (modified for unconfined conditions) in cases where insufficient data were available. Recovery data were analyzed using the Theis (1935) residual drawdown method. Average values of transmissivity, storage coefficient and hydraulic conductivity were summarized in BGC (2011b) and are reproduced in Table 2 of the main report.

3.2. BGC 2015 Peterson Creek Aquifer Pumping Test

BGC (2015b) performed a constant rate discharge test to collect hydrogeological data from the Peterson Creek (PC) Aquifer (Appendix M). The purpose of the testing was to: provide further information about the geology, site hydrogeology and hydrostratigraphy; obtain larger scale estimates of hydraulic conductivity and storage in the PC aquifer; obtain additional water samples for use in the evaluation of groundwater quality in the PC aquifer; and provide data for the numerical groundwater flow model being developed by BGC for the site.

A pumping well (BGC14-PW01) and observation well (BGC14-018) were drilled and wells were installed. The pumping well was completed using a 152 mm (6 inch) inner diameter, 100 slot, telescopic, stainless steel (standard Johnson 304) screen. It was installed from 79.2 m (260 ft.) to 73.1 m (240 ft.). Native materials of coarse sand and fine gravel filled the annular space surrounding the well screen. The 203 mm (8 inch) casing was pulled back to the top of screen 73.1 mm (240 ft.). A 0.61 m (2 ft.) riser was attached above the screen, and a rubber K packer was installed at 72.54 m (238 ft.).

The pumping well was completed using a 152 mm (6 inch) inner diameter, 10-slot, telescopic stainless steel screen installed from 75.0 mm (246 ft.) to 74.1 mm (243 ft.). A 10-slot screen was chosen to limit to the extent practical surrounding fine grained materials from entering the

well screen during development. Native materials filled the annular space surrounding the well screen. The 203 mm (8 inch) casing was pulled back to the top of screen 74.1 mm (243 ft.). A 0.61 m (2 ft.) long, 152 mm (6 inch) diameter solid riser pipe was attached above the screen, and a rubber K packer was installed at 73.46 m (241 ft.).

A 6" Berkeley 7T 500-60, 60 horse power (hp) and up to 500 US GPM pump was installed in BGC14-PW01 at a depth of 69.8 m (229 ft.) to conduct the pumping test. A step rate discharge test was conducted and consisted of four pumping steps at increasing discharge rates of 98, 197, 299, and 397 US gpm. The pumping steps were 60 minutes long for the first two pumping rats and 90 minutes for the last two rates. Recovery of the water level was monitored in the pumping well following the fourth pumping step.

The constant rate discharge test was conducted over a period of 3 days, at a pumping rate of approximately 251 US gpm. Discharge rates were monitored by a Krohne Digital Magnetic Flow Meter. The pumping well and eight additional monitoring wells, including BGC14-018, were monitored manually and digitally using a Solinst water level meter and Solinst Leveloggers.

After the pump was shut off, groundwater levels were monitored at the pumping well and monitoring wells for 6 hours manually and for 7 days digitally during recovery. The results of the test were used to estimate hydraulic conductivity and storage coefficient in the PC aquifer, groundwater quality results from the PC aquifer, estimates of hydrogeologic boundaries, and information about the geology, site hydrogeology and hydrostratigraphy.

Estimates of hydrogeological parameters were made using drawdown data from the step rate and constant rate discharge tests, as well as recovery monitoring data. Hydraulic conductivity and storage coefficient for the PC Aquifer were determined from the constant rate discharge test drawdown and recovery data using the Theis (1935) and Copper-Jacob (1946) solutions for unconfined aquifers. Average values of transmissivity, storage coefficient and hydraulic conductivity were summarized in Appendix M (BGC 2015b) and are reproduced in Table 2 of the main report.

4.0 PUMP-IN TESTS

Short duration pump-in tests were conducted by Piteau Associates (2006) while drilling within waste rock near the Afton mine. Piteau Associates (2006) indicated that the procedure involved pumping water into cased drill holes at a known rate for 45 to 60 seconds, and monitoring the decline of water level with time. Twenty-three (23) tests were conducted at nominal 6 m intervals within five boreholes and were intended to provide an indication of waste rock hydraulic conductivity. Data were analyzed using the Hvorslev (1951), testing and analysis methods are described in detail in Piteau (2006).

A summary of estimated hydraulic conductivity values from pump-in tests are provided in Table 2 of the main report.

REFERENCES

BGC (2011a), Ajax Project Feasibility Study - Open Pit Geotechnical and Hydrogeological Assessments. Report prepared by BGC Engineering Inc. for Abacus Mining and Exploration Corporation, dated November 10, 2011, Doc. No.:0712-003-R03-2011.

BGC (2011b), Ajax Project Feasibility Study - Prototype Dewatering Well and Pumping Test. Report prepared by BGC Engineering Inc. for Abacus Mining and Exploration Corporation, dated September 10, 2011, Doc. No.:0712-003-M01-2011.

BGC (2015a), Ajax Project EA – Ajax South Groundwater and Surface Water Site Investigation - DRAFT. Memorandum prepared for KGHM Ajax Mining Inc.

BGC (2015b), Ajax Project EA - Peterson Creek Aquifer Pumping Test - DRAFT. Memorandum prepared for KGHM Ajax Mining Inc.

Cedegren, H. (1989), Seepage, Drainage, and Flow Nets, Third Edition, New York, John Wiley and Sons, 465p.

Cooper, H.H., Jr., and C.E. Jacob (1946), A generalized graphical method for evaluating formation constants and summarizing well field history. Trans. Amer. Geophys. Union, 27, pp. 526-534.

Cooper, H. H., J. D. Bredehoeft, and S. S. Papadopulos (1967), Response of a finite-diameter well to an instantaneous charge of water, Water Resources Research, 3(1), 263-269.

Golder Associates (2011), Ajax Copper/Gold Project – Factual Report on the Geotechnical Investigation for the Tailings Storage Facility, Tailings Storage Facility Pond and Thickened Tailings Plant Areas. Report prepared for Abacus Mining and Exploration Corp., dated October 14, 2011, Doc. No. 10-9002-0032.

Hvorslev, M. J. (1951), Time lag and soil permeability in Ground-Water Observations, edited, p. 50, Waterways Experiment Station, U.S. Army Corps of Engineers, Vicksburg.

Klohn Leonoff (1988), Ajax Mine Project Hydrogeology Study, Report prepared by Klohn Leonoff Consulting Engineers for Afton Operating Corporation, dated May 11, 1988, 94p.

Klohn Crippen Berger (2014), Ajax MIne - Jacko Lake Hydrogeology Assessment. Site Investigation Report, Draft - Rev. A., Prepared Klohn Crippen Berger for KGHM Ajax Mining Inc., Dated December 4, 2014, 333p.

Knight Piesold (2007), Preliminary Groundwater Investigation. Report prepared for Abacus Mining and Exploration Corp., Afton Project, dated December 17, 2007. Ref No. VA101-246/5-2.

Knight Piesold (2011), Hydrogeological Site Investigation Data Report. Report prepared for KGHM Ajax MIning Inc., dated February 27, 2012, Ref No., VA101-246/8-3.

Lacroix, Y (1960). Notes on the determintation of coefficients of permability in the laboratory and in situ; Unpublished report.

Neuman, S.P. (1974), Effect of Partial Penetration on Flow in Unconfined Aquifers Considering Delayed Gravity Response of the Water Table, Water Resources, Research, 10(2), 303-312.

Piteau Associates (2006), Permit Level Hydrogeological Assessment for Tailings Storage Facility and Block Cave, New Afton Copper-Gold Project, Kamloops, B.C.. Report prepared for New Gold Inc. Hatch Associates, dated November 2006, Project. No.: 2807.

Theis, C.V. (1935), The relation between the lowering of the piezometric surface and the rate and duration of discharge of a well using groundwaetr storage. Trasns. Amer. Geophys. Union, 2, pp. 519-524.

Van der Kamp, G. (1976), Determining aquifer transmissivity by means of well response tests: The underdamped case. Water Resources Research 12, no. 1, p71-77.

Zangar, C.N. (1953) Theory and problems of water percolation; U.S. Department of Interior Bureau of Reclamation, No. 8.

APPENDIX I
THEIM-DUPUIT METHOD FOR ESTIMATION OF HYDRAULIC CONDUCTIVITY

APPENDIX I
ESTIMATION OF HYDRAULIC CONDUCTIVITY USING WRBC WELL DATA – DRAFT

The WRBC water well database consists of attributes compiled by the BC Ministry of Environment (MOE) from driller's logs of water wells which have been drilled, dug or driven in the province. Well record attributes may include detailed descriptions of the well site (location, owner, elevation, etc.) as well as well owners, drillers, information on construction, water levels, lithology, well capacity, pumping test data, water quality, and intended well use.

In cases where WRBC water well data within the Ajax RSA contained driller's estimates of well yield, static water level and borehole radius, order-of-magnitude estimates of formation hydraulic conductivity may be made based on the following unconfined steady state solution to the groundwater flow equation (Fetter, 2001):

$$Q = \pi K \frac{H^2 - h_w^2}{\ln\left(\frac{R}{r_w}\right)}$$

where:

Q = well discharge rate (i.e., estimated well yield) [L^3/T]
K = formation hydraulic conductivity [L/T]
r_w = radius of the pumped well [L]
R = radius of pumping influence [L]
h_w = steady-state head in the pumped well [L]
H = equilibrium head in the formation before pumping (i.e. saturated thickness) [L].

The above equation can be rearranged to solve for K as follows:

$$K = \frac{Q}{\pi(H^2 - h_w^2)} \ln\left(\frac{R}{r_w}\right)$$

Saturated thickness was calculated as the difference between the drilled depths and recorded static water levels. In boreholes that were reported to be completed in unconsolidated materials but had advanced into bedrock, saturated thickness was computed as the difference between the logged depth to bedrock and static water level. The maximum radius of pumping influence was assumed to be equal to 550 m, based on observations made during the pumping test completed by BGC at the Ajax site in 2011. In addition, the steady-state head in the pumped well was assumed to be equal to the base of the well (i.e., the total saturated thickness was drawn down to zero in the bottom of the well, $h_w = 0$).

Many of the well records within the WRBC database do not contain the complete set of attributes described above (e.g., were missing lithology information) or contained ambiguous data. As a result, several data processing steps were necessary and assumptions were made. These included:

1. Records that did not contain entries for yield, static water level or borehole radius were omitted from the calculation.
2. Detailed drill logs were obtained from the MOE for WRBC water well records that contained entries for yield, static water level and borehole radius but no logged lithology. These drill logs were used to interpret whether wells were completed in bedrock or in unconfined materials.
3. In cases where well yield was reported as Gallons Per Minute (GPM), and not specifically Imperial Gallons per minute (IGPM) or US Gallons per minute (UGPM), units were assumed to be in UGPM. In addition, in records where no units were recorded, yield values were assumed to have been reported in UGPM.
4. Location information and logged/interpreted borehole lithology were used to link well records with mapped aquifers, where available.

Additional assumptions which are inherent to the calculation method include:

- The aquifer is unconfined, has an infinite areal extent, is homogeneous, isotropic and is of uniform thickness over the area influenced by the test
- Prior to pumping, the piezometric surface is horizontal over the entire area that will be influenced
- The aquifer is pumped at a constant rate
- The well fully penetrates the saturated thickness of the aquifer
- The gradient between the pumping well and monitoring points is at steady state
- Flow is horizontal and uniform everywhere in a vertical section through the axis of the well.

It is noted that several of the above requirements are not met within the WRBC database (e.g., water level data are not likely representative of the phreatic surface at the time of measurement because the water table would have been disturbed by drilling). This calculation methodology is moderately sensitive to the assumed radius of influence of the test (e.g., varying R from 550 m to 55 m changes the estimate of hydraulic conductivity by approximately 2.3 times) and very sensitive to the assumed drawdown in the well (e.g., reducing drawdown in the well by a factor of 10 increases the estimated K by as much as 100 times). Therefore, estimates of hydraulic conductivity using these data are considered less reliable than others documented in the main baseline report. These estimates do, however, provide a means to estimate the range of variation in hydraulic conductivity within a mapped aquifer for use in bracketing sensitivity studies during numerical groundwater flow model development.

Estimated values of hydraulic conductivity from the WRBC data are summarized in Table F-1.

Reference

Fetter, C. W. (2001), *Applied Hydrogeology*, 4th ed., 598 pp., Prentice Hall, New Jersey.

APPENDIX J
HYDRAULIC CONDUCTIVITY ESTIMATES IN THE ABERDEEN AREA

Table reproduced from Golder Golder (2008a), Hydrogeological Investigation (1998 - 2000) Aberdeen Area, Kamloops, BC, Report prepared by Golder Associates Ltd. for the City of Kamloops, dated September 25, 2008.

9/17/2003

Table 3 **Synopsis of hydraulic data for the Aberdeen Area**

	Geo Unit (from GR analysis)	Geo Unit (from old panel.xls)	K^1 range m/s		K^2 range m/s		Aqtesolv Type	T^7 estimate m2/s	K^3 estimate m/s	K^4 estimate cm/s	K^4 estimate m/s	K^5 estimate m/s	Klohn estimates m/s	K^6 estimate m/s
78-17-105	Qstl	Qstl	2.6E-08	5.1E-08			1			1.1E-06	1.1E-08	1.1E-08		
804-55'	Qstl	Qstl	1.4E-07	6.3E-07			1,2							
804-165'	Qstl	Qstl	5.8E-09	1.4E-08			1							
805-15	Qstl	Qstl	9.0E-08	1.0E-06			1							
MW1-B		Qstl	5.6E-07	3.1E-06	7.6E-07	3.3E-06	2							
MW3		Qstl	2.0E-07	5.7E-07			1(2)							
BH1C		Qstl												high
BH3B	Qstl	Qstl												8.5E-08
BH4C	Qstl	Qstl												1.0E-10
BH5A	Qstl	Qstl												3.6E-08
BH6A	Qstl	Qstl												2.8E-09
BH6B	Qstl	Qstl												1.5E-09
BH6C	Qstl	Qstl												7.8E-09
BH7B	Qstl	Qstl												1.6E-07
BH7C	Qstl	Qstl												7.8E-09
BH8B	Qstl	Qstl												4.8E-07
BH8C	Qstl	Qstl												2.7E-09
BH9C	Qstl	Qstl												1.1E-08
BH10A	Qstl	Qstl												1.7E-07
BH10B	Qstl	Qstl												2.0E-08
BH10C	Qstl	Qstl												1.2E-08
810 (65)	*Qstl/Esf*	Esf												
MW94-4	*Qstl/Esf*		9.6E-09	3.3E-08			1			7.0E-09	7.0E-11	7.0E-11		
78-17-147	Esf	Esf												
801	Esf	Esf												
802	Esf	Esf												
806	Esf	Esf	5.2E-04	1.8E-05	4.6E-06	1.5E-05	1,3							
810 (130)	Esf	Esf										4.5E-09		
MW94-3	Esf													
P92-3-180	Esf	Tknv	5.9E-10		5.9E-10		3			7.0E-08	7.0E-10	7.0E-10		
DW92-1-160	*Esf/Esbx*	Tknv	2.1E-08	2.6E-07			2			2.1E-05	2.1E-07	2.1E-07		
P96-2	Esf	Esf	3.4E-08	3.0E-06			2		7.0E-07			1.0E-06	1.0E-06	
P96-3	Esf	Esf							1.0E-08			5.7E-06		
P96-4	Esf	Esf							2.0E-06			2.0E-06		
P96-5	Esf	Esf	5.5E-05	8.3E-05			1		3.0E-05			3.0E-05	3.0E-05	
P96-6	Esf	Tknv							5.0E-08			3.5E-07		
BH7A	Esf	Tknv							4.9E-08					4.9E-08
BH9B	Esf	Qstl							3.4E-07					3.4E-07
78-17-163	*Esf/Esbx*	Esbx						1.7E-08		3.3E-07	3.3E-09	3.3E-09		
DW92-1-215	Esbx	Tknv								7.3E-09	7.3E-11	7.3E-11		
DW92-2	Esbx	Tknv							7.0E-05	9.8E-04	9.8E-06			
DW92-3	Esbx								7.0E-05	6.7E-04	6.7E-06			
DW92-4 (165)	Esbx	Tknv								1.7E-06	1.7E-08	1.7E-08		
P92-1	Esbx	Tknv								2.7E-08	2.7E-10	2.6E-10		
P92-3-285	Esbx or Nv	Tknv						2.2E-07		5.0E-08	5.0E-10	5.0E-10		
805-104		Esbx	7.3E-07	2.7E-06	5.2E-07	1.8E-06	2,1							
P96-1	*Qstl/Esbx*	Tknv	1.1E-06	2.1E-06	8.2E-07	1.5E-06	2,3		7.0E-07			1.0E-06	1.0E-06	
P96-9	*Esf/Esbx*	Esbx	1.4E-06	3.0E-06			1		2.0E-07			3.1E-06	1.1E-06	
BH3A	Esbx	Tknv							8.5E-08					8.5E-08
BH9A	Esbx	E							1.4E-06					1.4E-06
BH1B		E							2.8E-08					2.8E-08
DW92-4 (305)	Tknv									3.1E-07	3.1E-09	3.1E-09		
P92-2	Tknv									1.1E-08	1.1E-10	1.1E-10		
P96-7	Tknv	Tknv	6.5E-07	1.1E-06			1 (2)		1.0E-06			1.0E-06	1.0E-06	
P96-8	Tknv	Tknv							5.0E-07			5.0E-07		
BH1A		Tknv							1.0E-10					1.0E-10
810										4.5E-07	4.5E-09			
MW1-A			3.1E-08	4.1E-08			3							
BH8A	Qstl													
803 (65)	?									6.0E-06	6.0E-08			
803 (163)	?									1.0E-06	1.0E-08			

SOURCES:

K^1 Golder 1999 Aqtesolv Slug Test Analysis
K^2 Golder 1999 Aqtesolv Slug Test Analysis
K^3 Klohn, 1998 Stability Study
K^4 Klohn, 1992a Slope Depressurization Project based on rising head tests for depressurization wells
K^5 Golder Panelk.xls file
K^6 Golder File 952-3121
T^7 Golder Aqtesolv DW92 Pump Test

OTHER:

Aqtesolv Type:
1 - good number of points, straight line
2 - good number of points, two components, initial steep, later time slower dd
3 - not many points

GR Analysis : Internal Golder Analysis

OTHER ESTIMATES OF K

From Klohn, 1998	K_H	K_V	
Surficial Soils	1.E-07	1.E-08	
Kam. bedded	1.E-05	1.E-06	
Kam. unsorted	1.E-08	1.E-08	
Weathered Nic.	1.E-08	1.E-08	
Pumped Horizon	5.E-05	1.E-05	
Nic.	1.E-07	1.E-07	
Iron Mask Intrusive	1.E-06	1.E-06	(at Makoo Lake)

From Golder, 952-3121	Till	Kamloops	Nicola
Geo. Mean	1.68E-08	1.98E-07	7.51E-09
Average	8.90E-08	7.26E-07	4.44E-08
Max	4.79E-07	1.42E-06	8.45E-08
Min	1.02E-10	2.76E-08	1.03E-10

APPENDIX K
AERIAL PHOTO INTERPRETATION OF SURFICIAL DEPOSITS IN THE PETERSON CREEK VALLEY

N

680,000

685,000

690,000

695,000

5,615,000

5,610,000

A 8A

B 8B

C 8C

D 8D

E 8E

SCALE 1:50,000

500 0 500 1,000 1,500

METRES

THIS DRAWING MAY HAVE BEEN REDUCED OR ENLARGED. ALL SCALE NOTATIONS INDICATED ARE BASED ON ORIGINAL FORMAT DRAWINGS.

LEGEND

INTERPRETED EXTENT OF GLACIOFLUVIAL DEPOSITS

X:\Projects\1125_AJAX\007\GIS\Production\Report\20141014_AJAX_Project_Baseline_Groundwater_Hydrology_AssessmentUJ1_Interpreted_Extent_of_Glaciofluvial_Deposits_to_Kamloops.mxd

NOTES:
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BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

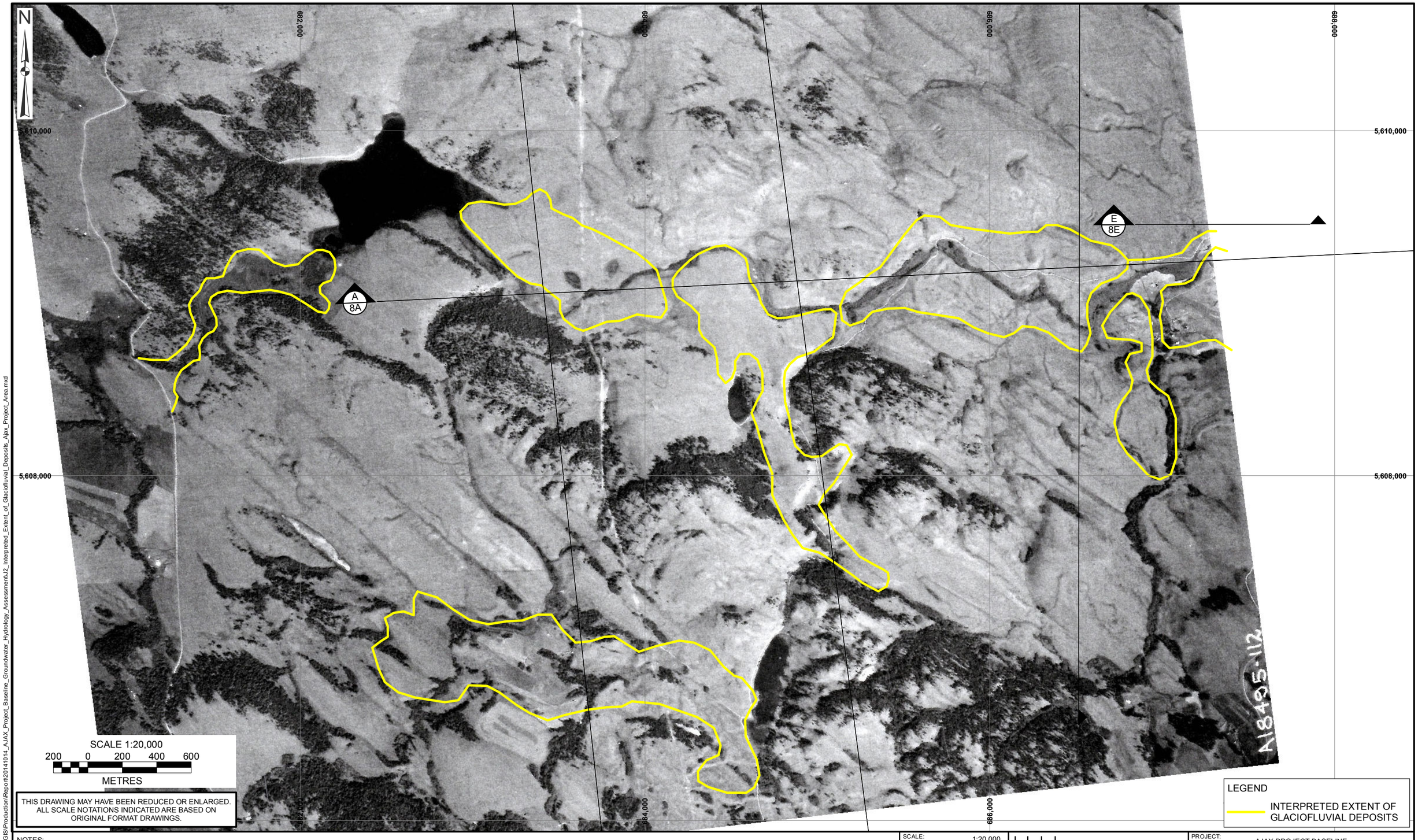
CLIENT: KGHM AJAX MINING INC.

PROJECT: AJAX PROJECT BASELINE GROUNDWATER HYDROLOGY ASSESSMENT

TITLE: INTERPRETED EXTENT OF GLACIOFLUVIAL DEPOSITS FROM THE PROJECT AREA TO KAMLOOPS FROM AERIAL PHOTOGRAPHY

PROJECT No.: 1125007

DWG No: K-1



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NOTES:
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CLIENT: KGHM AJAX MINING INC.

PROJECT: AJAX PROJECT BASELINE GROUNDWATER HYDROLOGY ASSESSMENT

TITLE: INTERPRETED EXTENT OF GLACIOFLUVIAL DEPOSITS WITHIN THE PROJECT AREA FROM AERIAL PHOTOGRAPHY

PROJECT No.: 1125007

DWG No: K-2

APPENDIX L
BC MOE AQUIFER CLASSIFICATION SYSTEM

Appendix L – BC MOE Aquifer Classification System

An Aquifer Classification System for Ground Water Management in British Columbia

(http://www.env.gov.bc.ca/wsd/plan_protect_sustain/groundwater/aquifers/Aq_Classification/Aq_Class.html#class)

Classification System

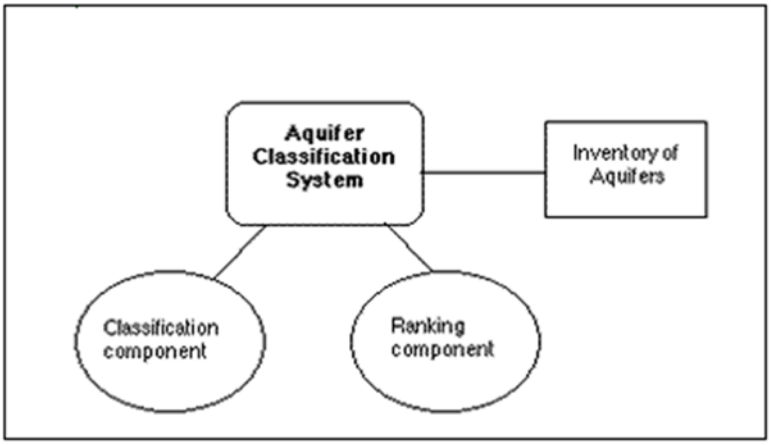
The aquifer classification system has two components:

1. *a classification* component to categorize aquifers based on their current level of development, (use) and vulnerability to contamination, and

2. a ranking component to indicate the relative importance of an aquifer.

The application of the classification system on a province-wide basis would provide a comprehensive inventory of aquifers (Figure 1).Classification and ranking values are determined for aquifers as a whole, and not for parts of aquifers.

Figure 1. Structure of Classification System



Classification Component

The classification component categorizes aquifers according to level of development and vulnerability to contamination: Level of Development and Vulnerability subclasses are designated. The composite of these two subclasses is the Aquifer Class (Table 1).

Development subclass: the level of development of an aquifer is determined by assessing demand verses the aquifer's yield or productivity. A high (**I**), moderate (**II**), or low (**III**) level of development can be designated.

Vulnerability subclass: the vulnerability of an aquifer to contamination from surface sources is assessed based on: type, thickness and extent of geologic materials overlying the aquifer, depth to water (or top of confined aquifers), and the type of aquifer materials. A high (**A**),moderate (**B**), or low (**C**) vulnerability can be designated.
Aquifer Class: the combination of the three development and three vulnerability subclasses results in nine aquifer classes (Table 1). For example, a class **IA** aquifer would be heavily developed with high vulnerability to contamination, while a **IIIC** would be lightly developed with low vulnerability.

Table 1. Classification Component

Development Sub-class

I	II	III
Heavy (demand is high relative to productivity)	Moderate (demand is moderate relative to productivity)	Light (demand is low relative to productivity)

Vulnerability Sub-class

A	B	C
High (highly vulnerable to contamination from surface sources)	Moderate (moderately vulnerable to contamination from surface sources)	Low (not very vulnerable to contamination from surface sources)

Aquifer Class

	I	II	III
A	**IA**-heavily developed, high vulnerability aquifer	**IIA**-moderately developed, high vulnerability aquifer	**IIIA**-lightly developed, high vulnerability aquifer
B	**IB**-heavily developed, moderate vulnerability aquifer	**IIB**-moderately developed, moderate vulnerability aquifer	**IIIB**-lightly developed, moderate vulnerability aquifer
C	**IC**-heavily developed, low vulnerability aquifer	**IIC**-moderately developed, low vulnerability aquifer	**IIIC**-lightly developed, low vulnerability aquifer

Ranking Component

A numerical measure of an aquifer's priority is provided by the aquifer's ranking value. The ranking value is determined by summing the point values for each of the following hydrogeologic and water use criteria: productivity, size, vulnerability, demand, type of use, quality concerns (that have health risk implications), and quantity concerns. (Table 2). All criteria have arbitrarily been assigned equal weight. Values range from a minimum of "1" to a maximum of "3", except for quality and quantity concerns which are assigned a minimum of "0" if concerns are not evident. Possible ranking scores range from a low of 5 to a high of 21; the higher the ranking score, the greater the aquifer's priority.

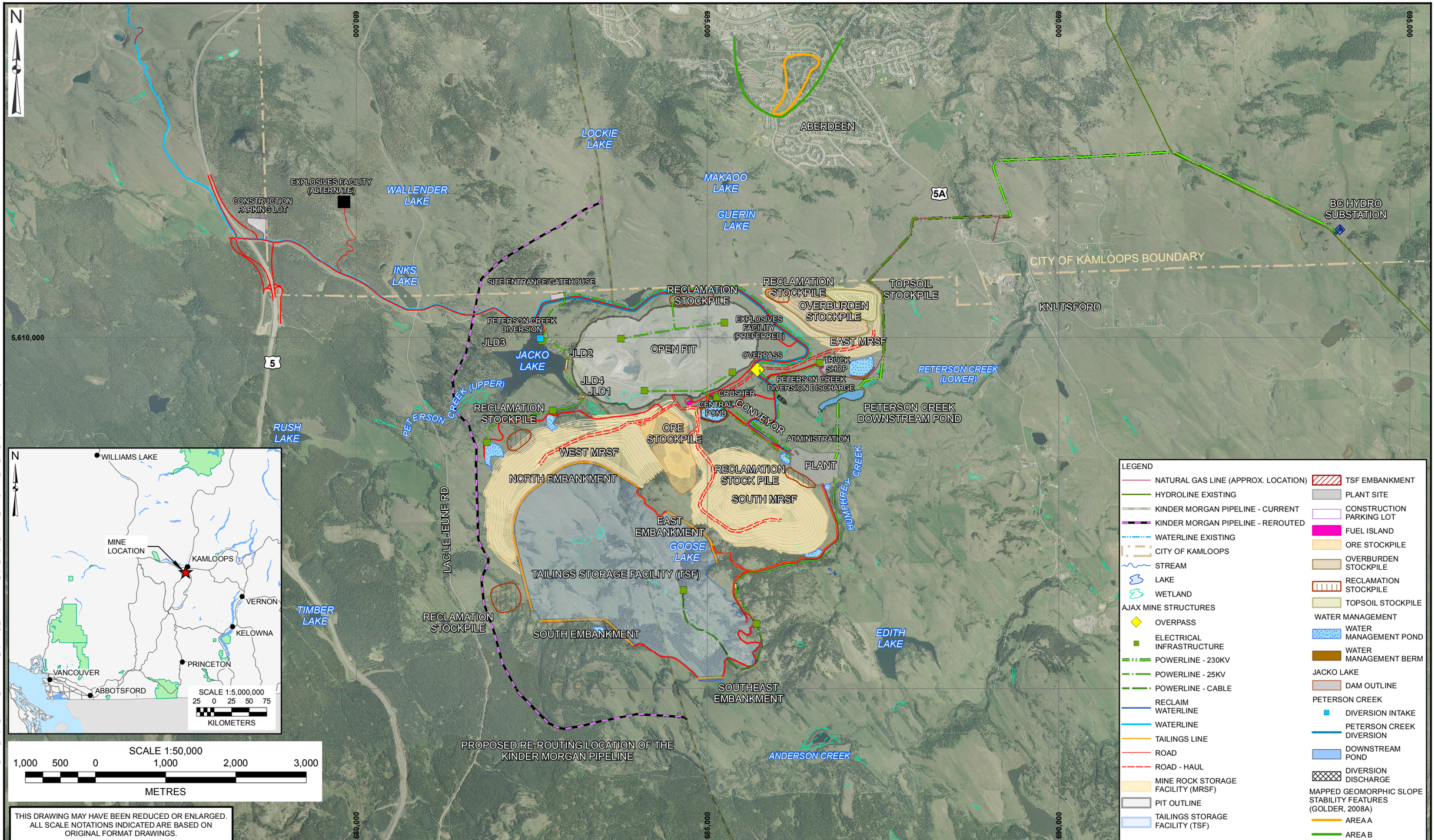
Table 2. Ranking Component

Appendix L – BC MOE Aquifer Classification System

Criteria	Point Value 1	2	3	Rationale
Productivity	low	moderate	high	abundance of the resource
Vulnerability	low	moderate	high	potential for water quality degradation
Size	<5 km²	5 - 25 km²	>25 km²	regionality of the resource
Demand	low	moderate	high	level of reliance on the resource for supply
Type of Use	non-drinking water	drinking water	multiple/ drinking water	variability/ diversity of the resource for supply
Quality concerns	isolated	local	regional	actual concerns
Quantity concerns	isolated	local	regional	actual concerns

The classification system is map-based with aquifers delineated at a scale of 1:50,000 (the classification system is only being applied in areas with well location mapping). An inventory database containing the attributes of each aquifer is built as aquifers are identified and classified. The maps and database can be readily incorporated into a geographical information system (GIS). Operationally, the system is office-derived using existing and readily available data sources. These include well records provided by well drillers (approximately 70,000 available across the province), published geologic mapping, and Ministry and consultants reports. Data availability and reliability constrain how technically rigorous the assessments can be (e.g.. while transmissivity values provide the basis for assessing aquifer productivity, these values are rarely available; productivity can alternatively be assessed using typical well yields, type of well use, aquifer materials and other indicators.) The data limitations are important to note as class designations strive for reasonable assessments based on the available data, not rigorous determinations. Given the broader management objectives of the system and the operational and data constraints, this approach is both acceptable and appropriate. It is acknowledged that the classification and ranking value of an aquifer is time dependent and could change with updated information.

DRAWINGS



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2. THIS DRAWING MUST BE READ IN CONJUNCTION WITH BGC'S REPORT TITLED "AJAX PROJECT BASELINE GROUNDWATER HYDROLOGY ASSESSMENT," AND DATED AUGUST 2015.
3. GENERAL ARRANGEMENT OF MINE SITE FACILITIES PROVIDED BY KAM ON APRIL 15, 2015.
4. ORTHOPHOTO PROVIDED BY KAM FROM EAGLE MAPPING AERIAL PHOTOGRAPHY DATED JUNE 26, 2006, PUBLISHED SEPTEMBER 29, 2006.
5. INSET BASEMAP FROM ESRI TOPOGRAPHIC BASEMAP.
6. PROJECTION IS NAD 1983 UTM ZONE 10N.
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APPROVED:	TWC

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: KGHM AJAX MINING INC.

PROJECT: AJAX PROJECT BASELINE GROUNDWATER HYDROLOGY ASSESSMENT

TITLE: AJAX PROJECT GENERAL ARRANGEMENT AND SITE LAYOUT

PROJECT No.: 1125007-03

01

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N

KAMLOOPS LAKE

THOMPSON RIVER

LOCATION OF KAMLOOPS LAKE WATER INTAKE

NORTH THOMPSON RIVER

SEE INSET

SOUTH THOMPSON RIVER

0728

0727

0282

0283

0284

0286

0272

0280

0285

0273

BEATON CREEK

HUGHES LAKE

PENDLETON CREEK

NED ROBERTS CREEK

ALKALI CREEK

SUGARLOAF HILL

0276 - SUGARLOAF HILL AQUIFER

PETERSON CREEK (LOWER)

0277 - DAVIDSON CREEK AQUIFER

0275 - KNUTSFORD AQUIFER

CAMPBELL CREEK

DAVIDSON BROOK

JACKO LAKE

0278 - PETERSON CREEK AQUIFER

HUMPHREY CREEK

KEYNES CREEK

CHERRY CREEK

JACKO CREEK

PETERSON CREEK (UPPER)

ANDERSON CREEK

0274 - BRIGADE LAKE AQUIFER

CHUWELS MOUNTAIN

5,620,000

5,610,000

5,600,000

670,000

680,000

690,000

700,000

SCALE 1:100,000

2000 1000 0 2000 4000 6000

METRES

THIS DRAWING MAY HAVE BEEN REDUCED OR ENLARGED. ALL SCALE NOTATIONS INDICATED ARE BASED ON ORIGINAL FORMAT DRAWINGS.

LEGEND

REGISTERED WATER WELLS

- COMMERCIAL AND INDUSTRIAL
- IRRIGATION
- OBSERVATION
- PRIVATE DOMESTIC
- WATER SUPPLY SYSTEM
- ABANDONED
- UNKNOWN

GROUNDWATER LOCAL STUDY AREA

GROUNDWATER REGIONAL STUDY AREA

CITY WATER SUPPLY LIMITS

COMPONENTS OF AJAX MINE

CITY OF KAMLOOPS BOUNDARY

0275 BC AQUIFER ID NO. (BEDROCK)

0277 BC AQUIFER ID NO. (SAND AND GRAVEL)

BEDROCK AQUIFER

SAND AND GRAVEL AQUIFER

CHERRY CREEK WATERSHED

PETERSON CREEK WATERSHED

ANDERSON CREEK WATERSHED

NOTES:
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2. THIS DRAWING MUST BE READ IN CONJUNCTION WITH BGC'S REPORT TITLED "AJAX PROJECT BASELINE GROUNDWATER HYDROLOGY ASSESSMENT," AND DATED AUGUST 2015.
3. BASE TOPOGRAPHIC DATA FROM NRCAN CANVEC. CONTOUR INTERVAL IS 20 m.
4. PROJECTION IS NAD 1983 UTM ZONE 10N.
5. WATER COMPILED FROM KAM, CITY OF KAMLOOPS AND NATIONAL HYDRO NETWORK.
6. AQUIFER EXTENTS AND ID NUMBERS FROM BC WATER RESOURCES ATLAS, DOWNLOADED IN JANUARY 2015.
7. UNLESS BGC AGREES OTHERWISE IN WRITING, THIS DRAWING SHALL NOT BE MODIFIED OR USED FOR ANY PURPOSE OTHER THAN THE PURPOSE FOR WHICH BGC GENERATED IT. BGC SHALL HAVE NO LIABILITY FOR ANY DAMAGES OR LOSS ARISING IN ANY WAY FROM ANY USE OR MODIFICATION OF THIS DOCUMENT NOT AUTHORIZED BY BGC. ANY USE OF OR RELIANCE UPON THIS DOCUMENT OR ITS CONTENT BY THIRD PARTIES SHALL BE AT SUCH THIRD PARTIES' SOLE RISK.

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CLIENT: KGHM AJAX MINING INC.

PROJECT: AJAX PROJECT BASELINE GROUNDWATER HYDROLOGY ASSESSMENT

TITLE: GROUNDWATER EFFECTS STUDY AREAS, MAPPED AQUIFERS AND REGISTERED WATER WELLS

PROJECT No.: 1125007-03

DWG No.: 02

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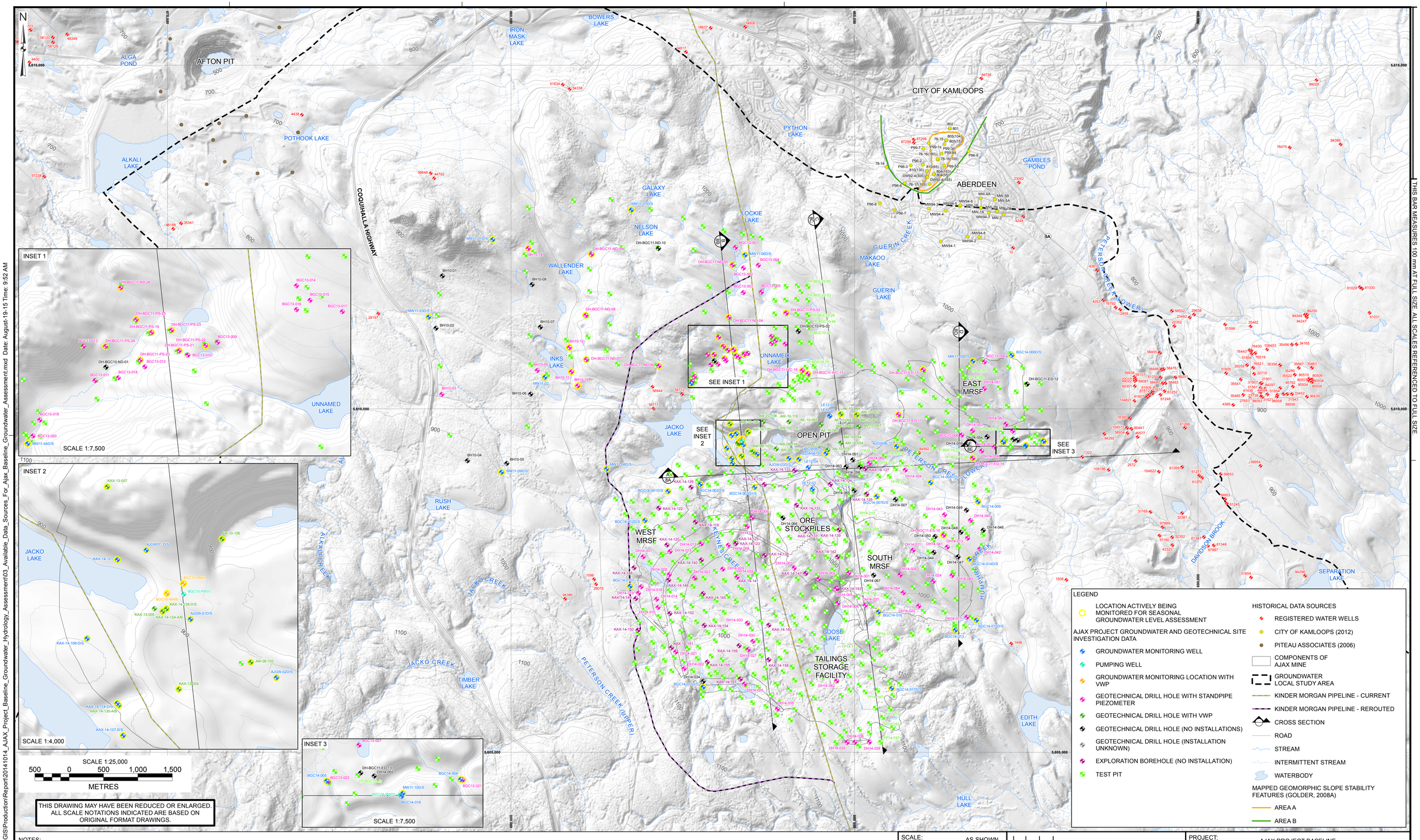

NOTES:
1. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.
2. THIS DRAWING MUST BE READ IN CONJUNCTION WITH BGC'S REPORT TITLED "AJAX PROJECT BASELINE GROUNDWATER HYDROLOGY ASSESSMENT," AND DATED AUGUST 2015.
3. BASE TOPOGRAPHIC DATA FROM KAM, CITY OF KAMLOOPS, AND GEOBASE INFORMATION. CONTOUR INTERVAL IS 20 m ON MAIN MAP AND 5 m ON INSET MAPS.
4. WATER COMPILED FROM KAM, CITY OF KAMLOOPS, AND NATIONAL HYDRO NETWORK. ROADS FROM NRCAN NATIONAL ROAD NETWORK.
5. GENERAL ARRANGEMENT OF MINE FACILITIES PROVIDED BY KAM ON APRIL 15, 2015.
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CLIENT: KGHM AJAX MINING INC.

PROJECT: AJAX PROJECT BASELINE GROUNDWATER HYDROLOGY ASSESSMENT

TITLE: AVAILABLE DATA SOURCES FOR AJAX BASELINE GROUNDWATER ASSESSMENT

PROJECT No.: 1125007-03

DWG No.: 03

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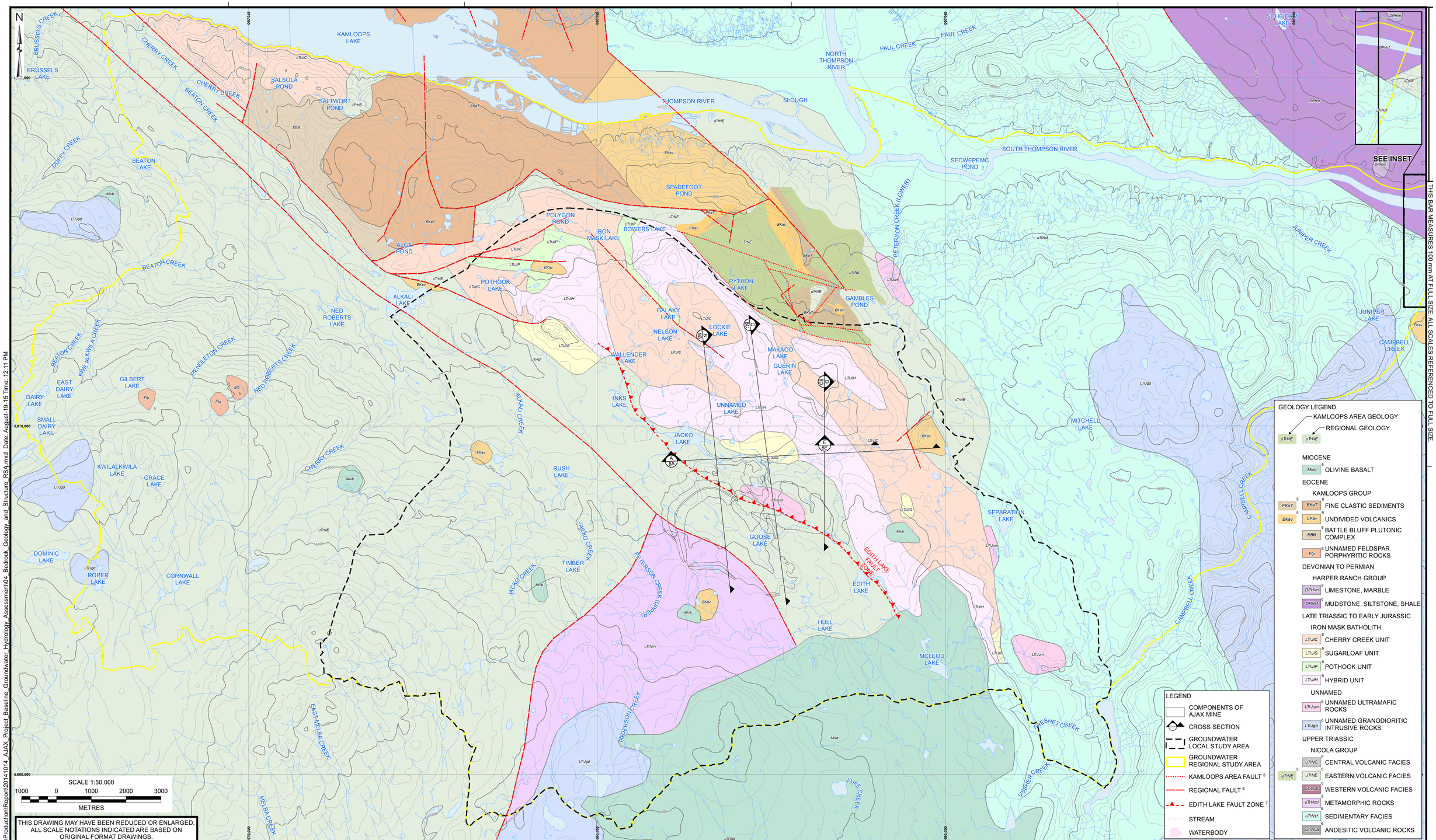

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3. MINE FACILITIES FROM KAM GENERAL ARRANGEMENT DATED APRIL 15, 2015.
4. WATER COMPILED FROM ABACUS, CITY OF KAMLOOPS, AND NATIONAL HYDRO NETWORK. TOPOGRAPHY FROM NRCAN CANVEC. CONTOUR INTERVAL 20 m.
5. READ, 1998.
6. MASSEY ET. AL., 2005.
7. LOGAN AND MIHALYNUK, 2006; CAMPBELL, 2015.
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CLIENT: KGHM AJAX MINING INC.

PROJECT: AJAX PROJECT BASELINE GROUNDWATER HYDROLOGY ASSESSMENT

TITLE: BEDROCK GEOLOGY AND STRUCTURE - REGIONAL STUDY AREA

PROJECT No.:	DWG No.:
1125007-03	04

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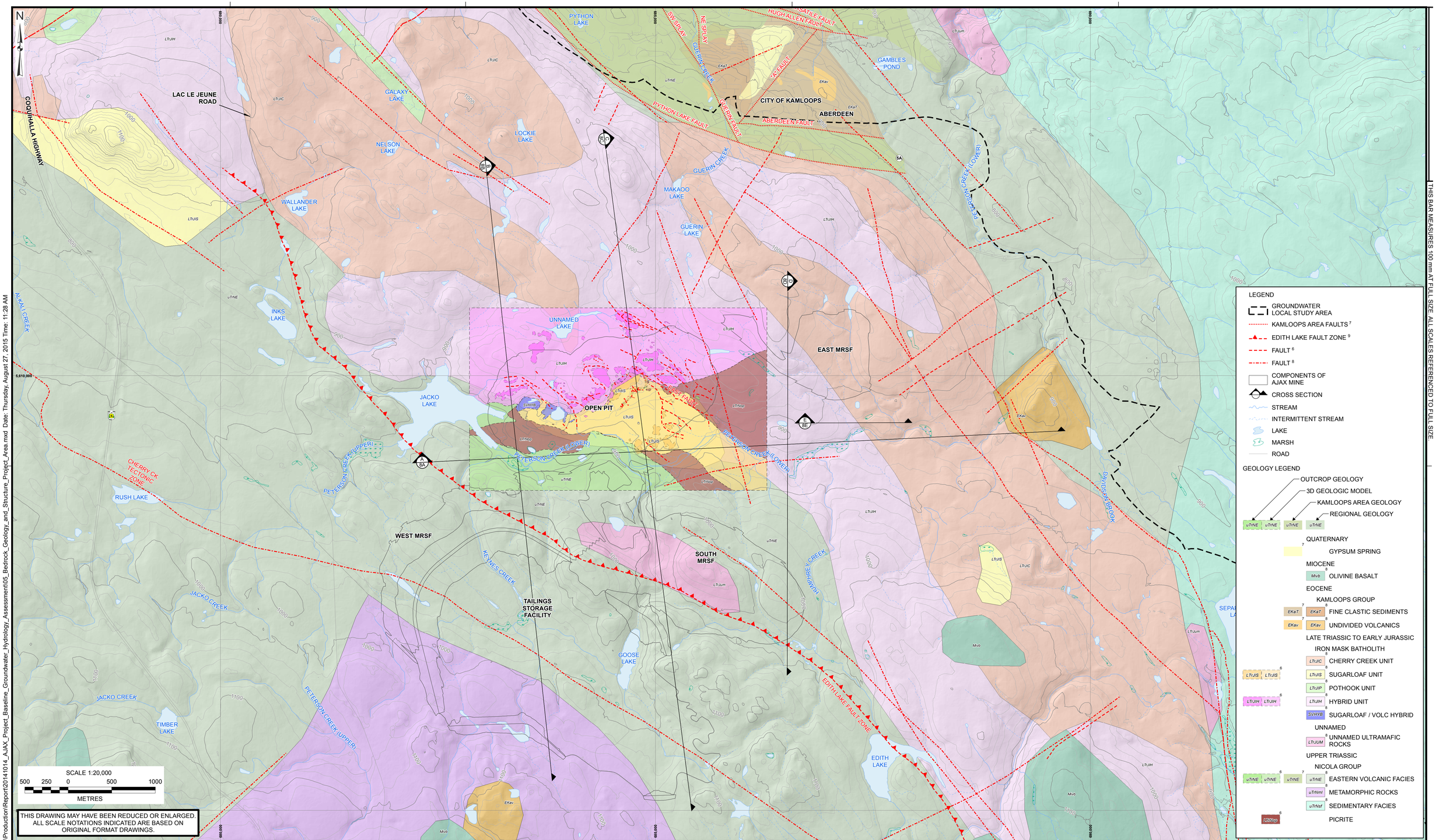

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2. THIS DRAWING MUST BE READ IN CONJUNCTION WITH BGC'S REPORT TITLED "AJAX PROJECT BASELINE GROUNDWATER HYDROLOGY ASSESSMENT," AND DATED AUGUST 2015.
3. AJAX MINE FACILITIES FROM KAM GENERAL ARRANGEMENT DATED APRIL 15, 2015.
4. WATER COMPILED FROM ABACUS, CITY OF KAMLOOPS, AND NATIONAL HYDRO NETWORK. ROADS FROM NRCAN NATIONAL ROAD NETWORK.
5. HILLSHADE FROM NRCAN DEM.
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7. READ, 1998.
8. MASSEY ET. AL., 2005.
9. LOGAN AND MIHALYNUK, 2006; CAMPBELL, 2015.
10. BASE TOPOGRAPHIC DATA FROM ABACUS, CITY OF KAMLOOPS, AND TRIM INFORMATION. CONTOUR INTERVAL IS 20 m.
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CLIENT: KGHM AJAX MINING INC.

PROJECT: AJAX PROJECT BASELINE GROUNDWATER HYDROLOGY ASSESSMENT

TITLE: BEDROCK GEOLOGY AND STRUCTURE: MINE SITE

PROJECT No.:	DWG No.:
1125007-03	05

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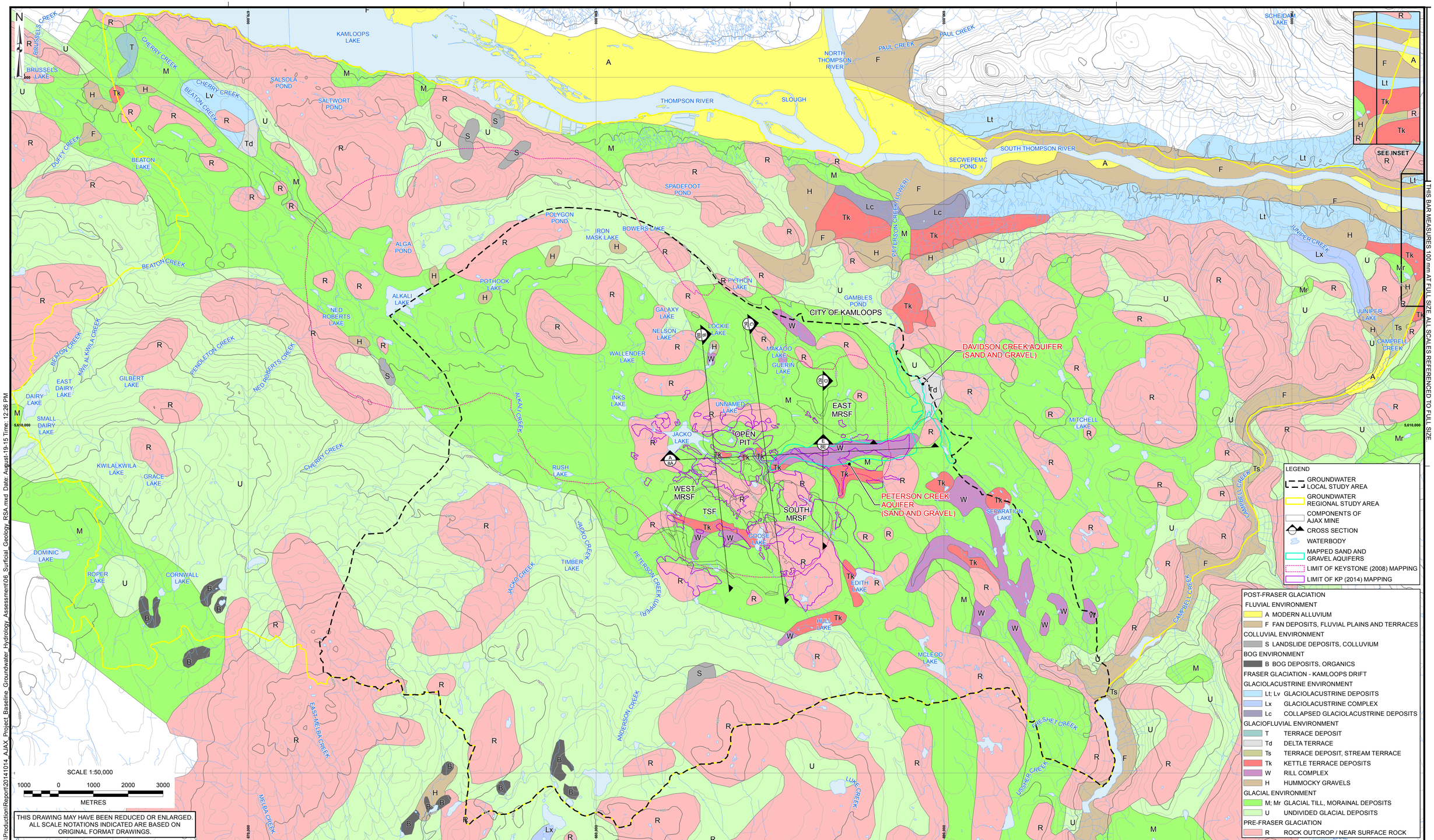

NOTES:
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3. MINE FACILITIES FROM KAM GENERAL ARRANGEMENT LAST UPDATED APRIL 15, 2015.
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SCALE:	1:50,000
DATE:	AUG 2015
DRAWN:	MIB
CHECKED:	CK
APPROVED:	TWC

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: KGHM AJAX MINING INC.

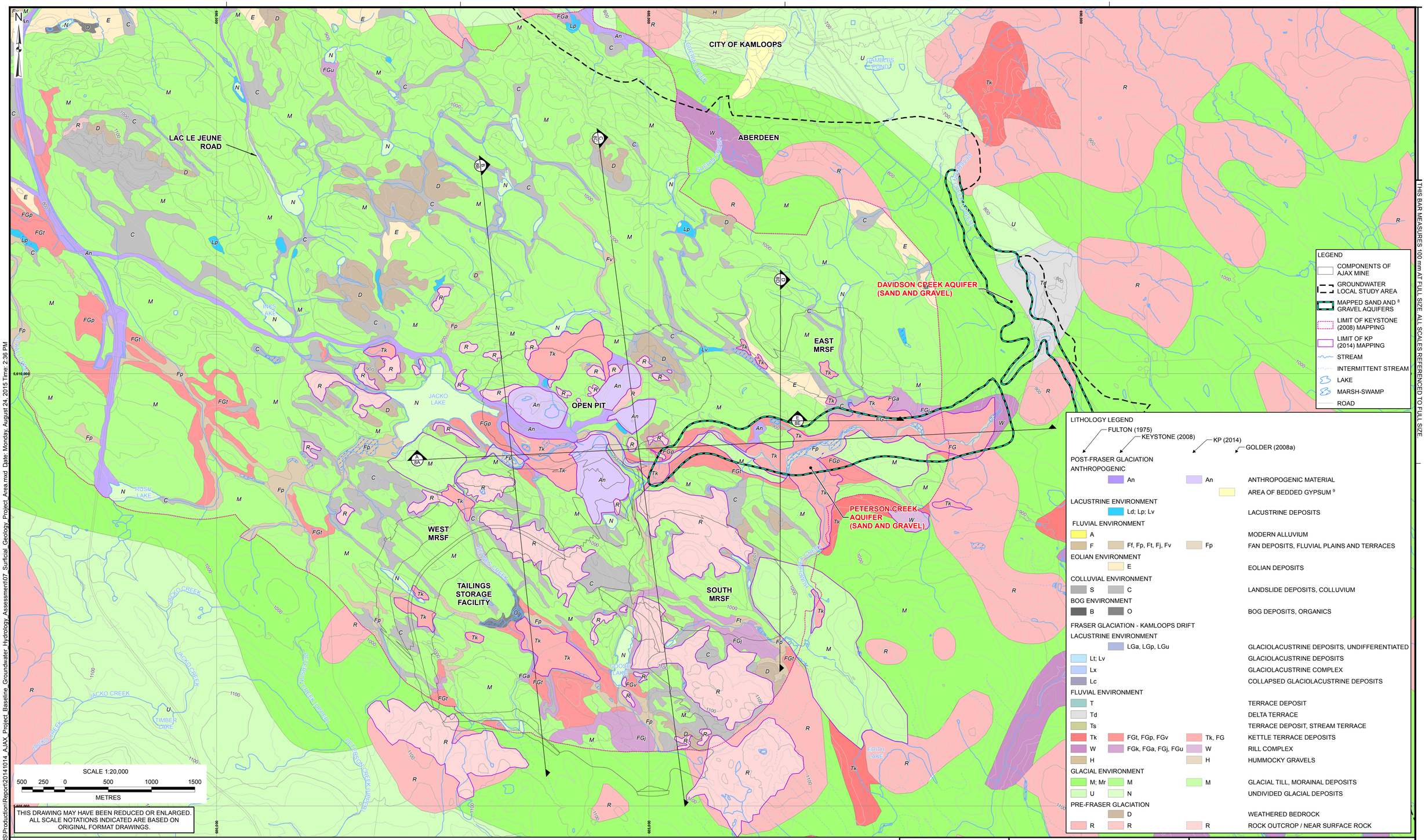
PROJECT: AJAX PROJECT BASELINE GROUNDWATER HYDROLOGY ASSESSMENT

TITLE: SURFICIAL GEOLOGY: REGIONAL STUDY AREA

PROJECT No.: 1125007-03

DWG No.: 06

X:\Projects\1125_AJAX\007\GIS\Production\Report\20141014_AJAX_Project_Baseline_Groundwater_Hydrology_Assessment\06_Surficial_Geology_RSA.mxd Date: August-19-15 Time: 12:26 PM



LEGEND

- COMPONENTS OF AJAX MINE
- GROUNDWATER LOCAL STUDY AREA
- MAPPED SAND AND [8] GRAVEL AQUIFERS
- LIMIT OF KEYSTONE (2008) MAPPING
- LIMIT OF KP (2014) MAPPING
- STREAM
- INTERMITTENT STREAM
- LAKE
- MARSH-SWAMP
- ROAD

LITHOLOGY LEGEND

FULTON (1975) / KEYSTONE (2008) / KP (2014) / GOLDER (2008a)

POST-FRASER GLACIATION

ANTHROPOGENIC

An	An		ANTHROPOGENIC MATERIAL
			AREA OF BEDDED GYPSUM [9]

LACUSTRINE ENVIRONMENT

Ld; Lp; Lv			LACUSTRINE DEPOSITS

FLUVIAL ENVIRONMENT

A			MODERN ALLUVIUM
F	Ff, Fp, Ft, Fj, Fv	Fp	FAN DEPOSITS, FLUVIAL PLAINS AND TERRACES

EOLIAN ENVIRONMENT

E			EOLIAN DEPOSITS

COLLUVIAL ENVIRONMENT

S	C		LANDSLIDE DEPOSITS, COLLUVIUM

BOG ENVIRONMENT

B	O		BOG DEPOSITS, ORGANICS

FRASER GLACIATION - KAMLOOPS DRIFT

LACUSTRINE ENVIRONMENT

LGa, LGp, LGu			GLACIOLACUSTRINE DEPOSITS, UNDIFFERENTIATED
Lt; Lv			GLACIOLACUSTRINE DEPOSITS
Lx			GLACIOLACUSTRINE COMPLEX
Lc			COLLAPSED GLACIOLACUSTRINE DEPOSITS

FLUVIAL ENVIRONMENT

T			TERRACE DEPOSIT
Td			DELTA TERRACE
Ts			TERRACE DEPOSIT, STREAM TERRACE
Tk	FGt, FGp, FGv	Tk, FG	KETTLE TERRACE DEPOSITS
W	FGk, FGa, FGj, FGu	W	RILL COMPLEX
H		H	HUMMOCKY GRAVELS

GLACIAL ENVIRONMENT

M; Mr	M	M	GLACIAL TILL, MORAINAL DEPOSITS
U	N		UNDIVIDED GLACIAL DEPOSITS

PRE-FRASER GLACIATION

	D		WEATHERED BEDROCK
R	R	R	ROCK OUTCROP / NEAR SURFACE ROCK

NOTES:
1. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.
2. THIS DRAWING MUST BE READ IN CONJUNCTION WITH BGC'S REPORT TITLED "AJAX PROJECT BASELINE GROUNDWATER HYDROLOGY ASSESSMENT," AND DATED AUGUST 2015.
3. GENERAL ARRANGEMENT OF MINE SITE FACILITIES PROVIDED BY KAM ON APRIL 15, 2015.
4. CONTOURS COMPILED FROM ABACUS, CITY OF KAMLOOPS, AND TRIM INFORMATION. CONTOUR INTERVAL IS 20 m.
5. WATER COMPILED FROM ABACUS, CITY OF KAMLOOPS, AND NATIONAL HYDRO NETWORK.
6. ROADS FROM NRCAN NATIONAL ROAD NETWORK.
7. PROJECTION IS NAD 83 UTM ZONE 10N.
8. FROM BC WATER RESOURCES ATLAS, DOWNLOADED IN JANUARY 2015.
9. REFERRED TO AS "GYPSUM SPRING" IN GOLDER 2008A.
10. UNLESS BGC AGREES OTHERWISE IN WRITING, THIS DRAWING SHALL NOT BE MODIFIED OR USED FOR ANY PURPOSE OTHER THAN THE PURPOSE FOR WHICH BGC GENERATED IT. BGC SHALL HAVE NO LIABILITY FOR ANY DAMAGES OR LOSS ARISING IN ANY WAY FROM ANY USE OR MODIFICATION OF THIS DOCUMENT NOT AUTHORIZED BY BGC. ANY USE OF OR RELIANCE UPON THIS DOCUMENT OR ITS CONTENT BY THIRD PARTIES SHALL BE AT SUCH THIRD PARTIES' SOLE RISK.

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CHECKED:	CK
APPROVED:	TWC

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: KGHM AJAX MINING INC.

PROJECT: AJAX PROJECT BASELINE GROUNDWATER HYDROLOGY ASSESSMENT

TITLE: SURFICIAL GEOLOGY: PROJECT AREA

PROJECT No.: 1125007-03

DWG No.: 07

THIS BAR MEASURES 100 mm AT FULL SIZE. ALL SCALES REFERENCED TO FULL SIZE

X:\Projects\1125_AJAX\007GIS\Production\Report\20141014_AJAX_Project_Baseline_Groundwater_Hydrology_Assessment\07_Surficial_Geology_Project_Area.mxd Date: Monday, August 24, 2015 Time: 2:36 PM

(E:682,446; N:5,609,009)

(E:689,620; N:5,609,361)

JACKO LAKE EL. 891 m
(OFFSET ~ 430 m N)

OPEN PIT

SUGARLOAF HILL AQUIFER

PETERSON CREEK AQUIFER

SUGARLOAF HILL AQUIFER

EXISTING GROUND SURFACE

KAX-14-126 (OFFSET 159 m S)
BGC14-002D/S (OFFSET 124 m S)
KAX-14-108 (OFFSET 385 m N)
KAX-14-114 (OFFSET 230 m N)
KAX-14-107 (OFFSET 155 m N)
BGC14-003D/I/S (OFFSET 204 m S)
AJGW02-D/S (OFFSET 272 m N)
KAX-14-132 (OFFSET 171 m S)
AJGW03-D/S (OFFSET 189 m N)
KAX-14-133 (OFFSET 10 m N)
AJGW04-D (OFFSET 170 m N)
LE12-04 (OFFSET 45 m N)
LE12-03 (OFFSET 274 m S)
AJGW05-S (OFFSET 234 m N)
KAX-14-134 (OFFSET 217 m S)
TP14-280 (OFFSET 52 m N)
KAX-14-127 (OFFSET 14 m S)
KAX-14-129 (OFFSET 384 m S)
TP14-279 (OFFSET 81 m N)
BGC14-007D/S (OFFSET 428 m S)
TP14-278 (OFFSET 153 m N)
TP14-213 (OFFSET 144 m S)
TP14-214 (OFFSET 36 m S)
AJGW06-D (OFFSET 283 m N)
DH-14-004 (OFFSET 63 m S)
84992 (OFFSET 175 m N)
BGC14-008D/S (OFFSET 265 m S)
TP-BGC10-37 (OFFSET 255 m N)
BGC13-008 (OFFSET 407 m N)
TP-BGC10-38 (OFFSET 61 m N)
DH-BGC11-ED-14 (OFFSET 62 m N)
TP-BGC13-25 (OFFSET 295 m N)
DH14-057 (OFFSET 207 m N)
BGC14-005 (OFFSET 278 m N)
BGC13-022 (OFFSET 275 m N)
TP-BGC10-40 (OFFSET 296 m N)
BGC13-007 (OFFSET 428 m N)
BGC14-PW01 (OFFSET 200 m N)
BGC14-018 (OFFSET 196 m N)
MW11-10D/S (OFFSET 209 m N)
BGC14-004 (OFFSET 256 m N)
BGC13-021 (OFFSET 254 m N)
1322 (OFFSET 2 m N)
2572 (OFFSET 93 m S)

INTERPRETED BEDROCK SURFACE

uTrNE - EASTERN VOLCANIC FACIES

LTrNop PICRITE UNIT

LTrJIS - SUGARLOAF UNIT DIORITIC INTRUSIVES

LTrJIH - HYBRID UNIT

LTrJIC - CHERRY CREEK UNIT

EKaT FINE CLASTIC SEDIMENTS

LTrNop - PICRITE

ELEVATION (m)

0 HORIZONTAL SCALE 1:20,000
VERTICAL SCALE 1:2,000

DISTANCE (m)

0 HORIZONTAL SCALE 1:20,000
VERTICAL SCALE 1:20,000

DISTANCE (m)
CROSS-SECTION A 03

CROSS SECTION AT BEARING 087.2°

LEGEND

- 2E-08 — ESTIMATED HYDRAULIC CONDUCTIVITY (m/s)
- 901.6 — AVERAGE ANNUAL WATER LEVEL
- INTERPRETED BEDROCK SURFACE
- ESTIMATED LITHOLOGY CONTACT
- OPEN PIT OUTLINE[1]

3D MODEL GEOLOGY AND STRUCTURE[2]

- MODELED LITHOLOGY CONTACT
- FAULT

LATE TRIASSIC TO EARLY JURASSIC IRON MASK BATHOLITH
- LTrJIS - SUGARLOAF UNIT DIORITIC INTRUSIVES
- LTrJIH - HYBRID UNIT

UPPER TRIASSIC NICOLA GROUP
- uTrNE - EASTERN VOLCANIC FACIES
- LTrNop - PICRITE

REGIONAL STRUCTURE[3]
- EDITH LAKE FAULT ZONE

REGIONAL GEOLOGY[4]

ECOENE - KAMLOOPS GROUP
- EKaT - FINE CLASTIC SEDIMENTS

LATE TRIASSIC TO EARLY JURASSIC IRON MASK BATHOLITH
- LTrJIC - CHERRY CREEK UNIT
- LTrJIH - HYBRID UNIT
- uTrJum - UNNAMED ULTRAMAFIC ROCKS

UPPER TRIASSIC - NICOLA GROUP
- uTrNE - EASTERN VOLCANIC FACIES
- uTrNmL - METAMORPHIC ROCKS

INTERPRETED SURFICIAL GEOLOGY[5]

POST-FRASER GLACIATION
- ANTHROPOGENIC MATERIAL

FRASER GLACIATION - KAMLOOPS DRIFT

GLACIOLACUSTRINE ENVIRONMENT
- GLACIOLACUSTRINE COMPLEX
- COLLAPSED GLACIOLACUSTRINE DEPOSITS

GLACIOFLUVIAL ENVIRONMENT
- KETTLE TERRACE DEPOSITS
- RILL COMPLEX

GLACIAL TILL, MORAINAL DEPOSITS
- GLACIAL TILL, MORAINAL DEPOSITS

NOTES:
1. ULTIMATE PIT SHELL DATED NOVEMBER 5, 2015 PROVIDED BY KAM.
2. PIT AREA GEOLOGY BASED ON 3D GEOLOGICAL MODEL RECEIVED FROM KAM ON SEPTEMBER 22, 2014; FAULTS BASED ON 3D STRUCTURAL MODEL RECEIVED FROM AME ON FEBRUARY 2, 2011.
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SCALE 1:20,000
250 0 250 500 750
METRES

SCALE:	AS SHOWN
DATE:	AUG 2015
DRAWN:	WKL
CHECKED:	CK
APPROVED:	TWC

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: KGHM AJAX MINING INC.

PROJECT: AJAX PROJECT
BASELINE GROUNDWATER HYDROLOGY ASSESSMENT

TITLE: CROSS SECTION A

PROJECT No.: 1125007-03

DWG No.: 08A

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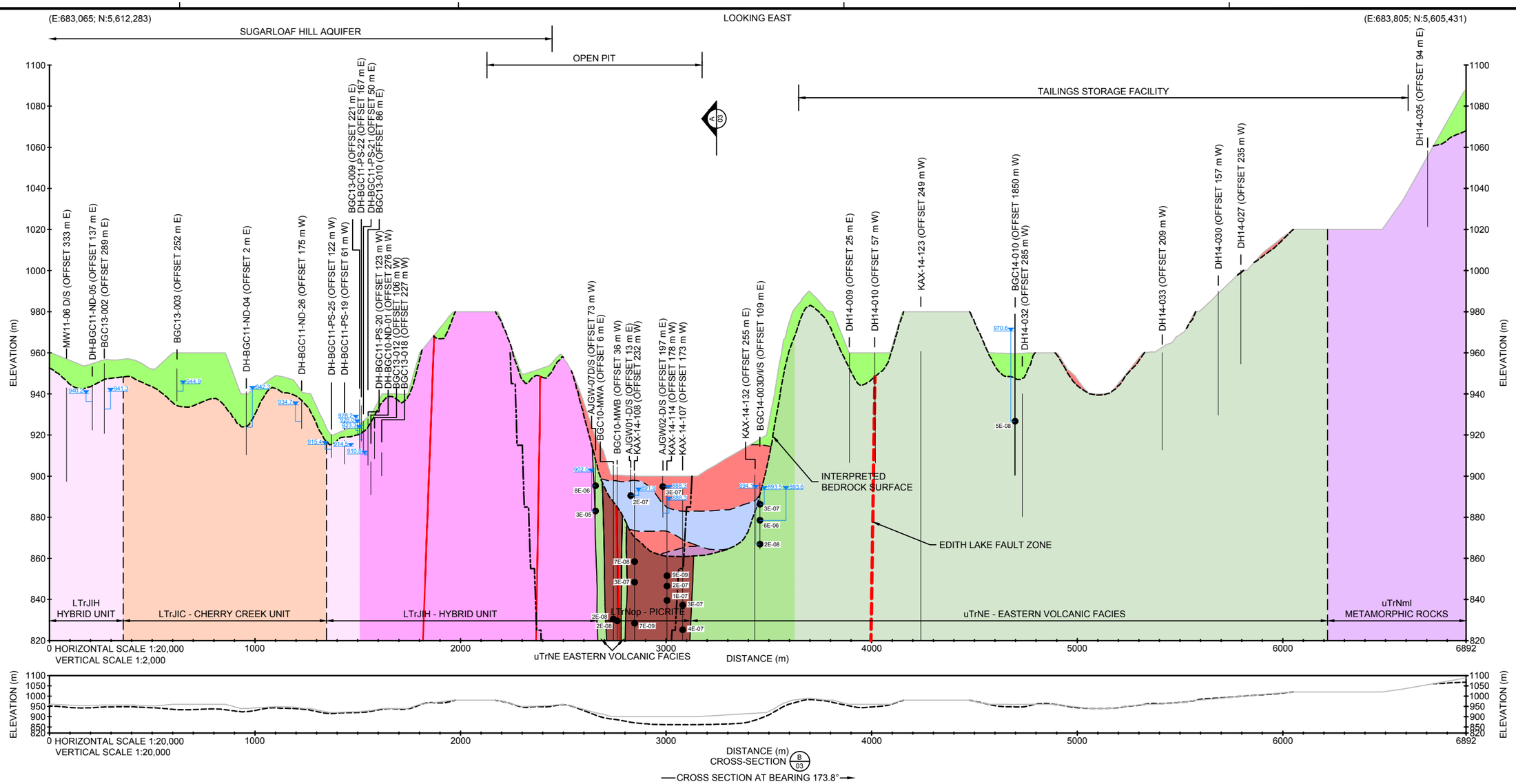

LEGEND

- 2E-08 — ESTIMATED HYDRAULIC CONDUCTIVITY (m/s)
- 901.6 — AVERAGE ANNUAL WATER LEVEL
- INTERPRETED BEDROCK SURFACE
- ESTIMATED LITHOLOGY CONTACT
- OPEN PIT OUTLINE[1]

3D MODEL GEOLOGY AND STRUCTURE[2]

- MODELED LITHOLOGY CONTACT
- FAULT

LATE TRIASSIC TO EARLY JURASSIC IRON MASK BATHOLITH

- LTrJIS - SUGARLOAF UNIT DIORITIC INTRUSIVES
- LTrJIH - HYBRID UNIT

UPPER TRIASSIC NICOLA GROUP

- uTrNE - EASTERN VOLCANIC FACIES
- LTrNop - PICRITE

REGIONAL STRUCTURE[3]

- EDITH LAKE FAULT ZONE

REGIONAL GEOLOGY[4]

ECOENE - KAMLOOPS GROUP

- EKaT - FINE CLASTIC SEDIMENTS

LATE TRIASSIC TO EARLY JURASSIC IRON MASK BATHOLITH

- LTrJIC - CHERRY CREEK UNIT
- LTrJIH - HYBRID UNIT
- uTrJum - UNNAMED ULTRAMAFIC ROCKS

UPPER TRIASSIC - NICOLA GROUP

- uTrNE - EASTERN VOLCANIC FACIES
- uTrNmL - METAMORPHIC ROCKS

INTERPRETED SURFICIAL GEOLOGY[5]

POST-FRASER GLACIATION

- ANTHROPOGENIC MATERIAL

FRASER GLACIATION - KAMLOOPS DRIFT

GLACIOLACUSTRINE ENVIRONMENT

- GLACIOLACUSTRINE COMPLEX
- COLLAPSED GLACIOLACUSTRINE DEPOSITS

GLACIOFLUVIAL ENVIRONMENT

- KETTLE TERRACE DEPOSITS
- RILL COMPLEX

GLACIAL TILL, MORAINAL DEPOSITS

- GLACIAL TILL, MORAINAL DEPOSITS

NOTES:

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SCALE 1:20,000

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METRES

SCALE:	AS SHOWN
DATE:	AUG 2015
DRAWN:	WKL
CHECKED:	CK
APPROVED:	TWC

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: KGHM AJAX MINING INC.

PROJECT: AJAX PROJECT
BASELINE GROUNDWATER HYDROLOGY ASSESSMENT

TITLE: CROSS SECTION B

PROJECT No.: 1125007-03

DWG No.: 08B

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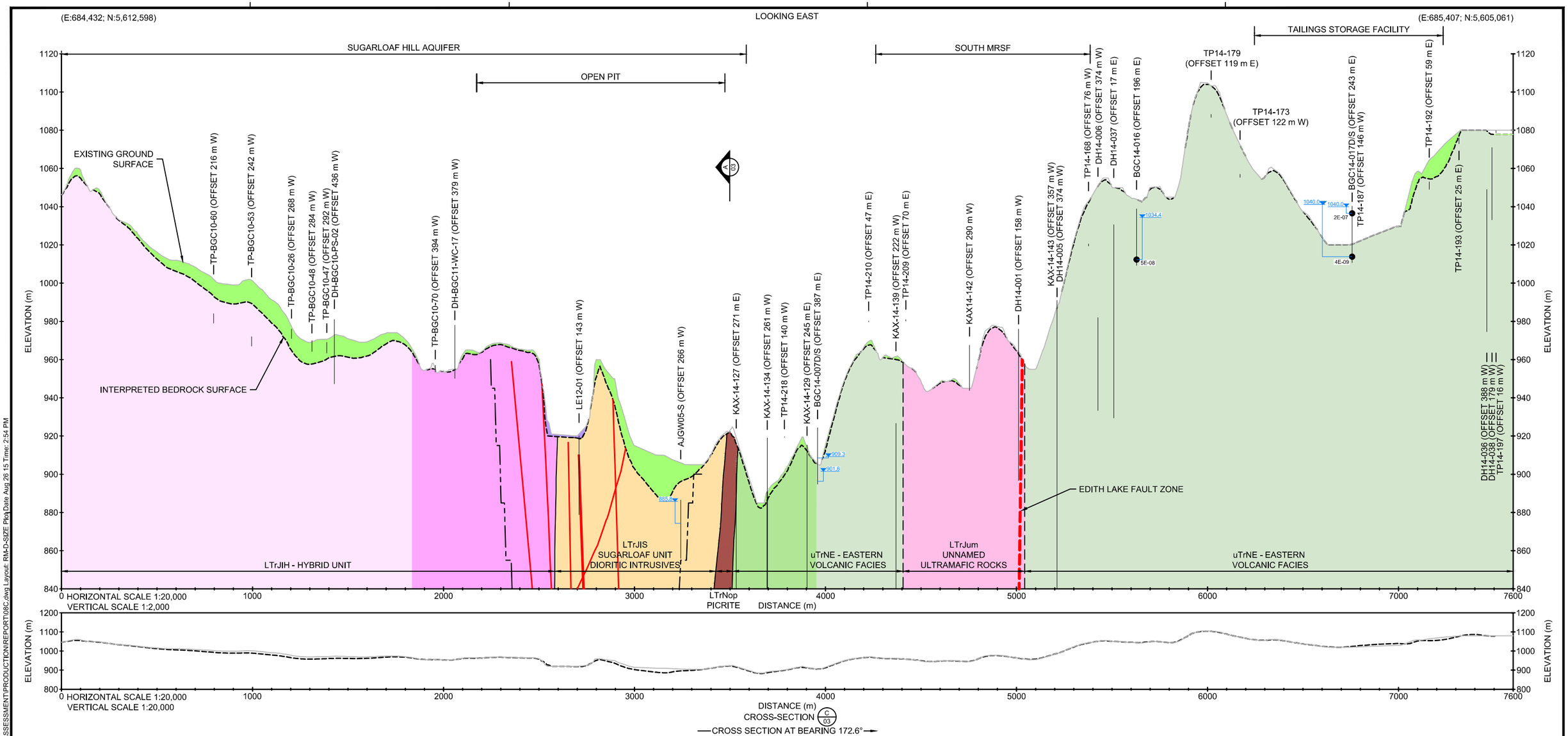

LEGEND

- 2E-08 — ESTIMATED HYDRAULIC CONDUCTIVITY (m/s)
- 901.6 — AVERAGE ANNUAL WATER LEVEL
- INTERPRETED BEDROCK SURFACE
- ESTIMATED LITHOLOGY CONTACT
- OPEN PIT OUTLINE[1]

3D MODEL GEOLOGY AND STRUCTURE[2]

- MODELED LITHOLOGY CONTACT
- FAULT

LATE TRIASSIC TO EARLY JURASSIC IRON MASK BATHOLITH
- LTrJIS - SUGARLOAF UNIT DIORITIC INTRUSIVES
- LTrJIH - HYBRID UNIT

UPPER TRIASSIC NICOLA GROUP
- uTrNE - EASTERN VOLCANIC FACIES
- LTrNop - PICRITE

REGIONAL STRUCTURE[3]
- EDITH LAKE FAULT ZONE

REGIONAL GEOLOGY[4]

ECOENE - KAMLOOPS GROUP
- EKaT - FINE CLASTIC SEDIMENTS

LATE TRIASSIC TO EARLY JURASSIC IRON MASK BATHOLITH
- LTrJIC - CHERRY CREEK UNIT
- LTrJIH - HYBRID UNIT
- uTrJum - UNNAMED ULTRAMAFIC ROCKS

UPPER TRIASSIC - NICOLA GROUP
- uTrNE - EASTERN VOLCANIC FACIES
- uTrNmL - METAMORPHIC ROCKS

INTERPRETED SURFICIAL GEOLOGY[5]

POST-FRASER GLACIATION
- ANTHROPOGENIC MATERIAL

FRASER GLACIATION - KAMLOOPS DRIFT
GLACIOLACUSTRINE ENVIRONMENT
- GLACIOLACUSTRINE COMPLEX
- COLLAPSED GLACIOLACUSTRINE DEPOSITS

GLACIOFLUVIAL ENVIRONMENT
- KETTLE TERRACE DEPOSITS
- RILL COMPLEX

GLACIAL TILL, MORAINAL DEPOSITS
- GLACIAL TILL, MORAINAL DEPOSITS

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SCALE 1:20,000
250 0 250 500 750
METRES

SCALE:	AS SHOWN
DATE:	AUG 2015
DRAWN:	WKL
CHECKED:	CK
APPROVED:	TWC

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: KGHM AJAX MINING INC.

PROJECT: AJAX PROJECT
BASELINE GROUNDWATER HYDROLOGY ASSESSMENT

TITLE: CROSS SECTION C

PROJECT No.: 1125007-03

DWG No.: 08C

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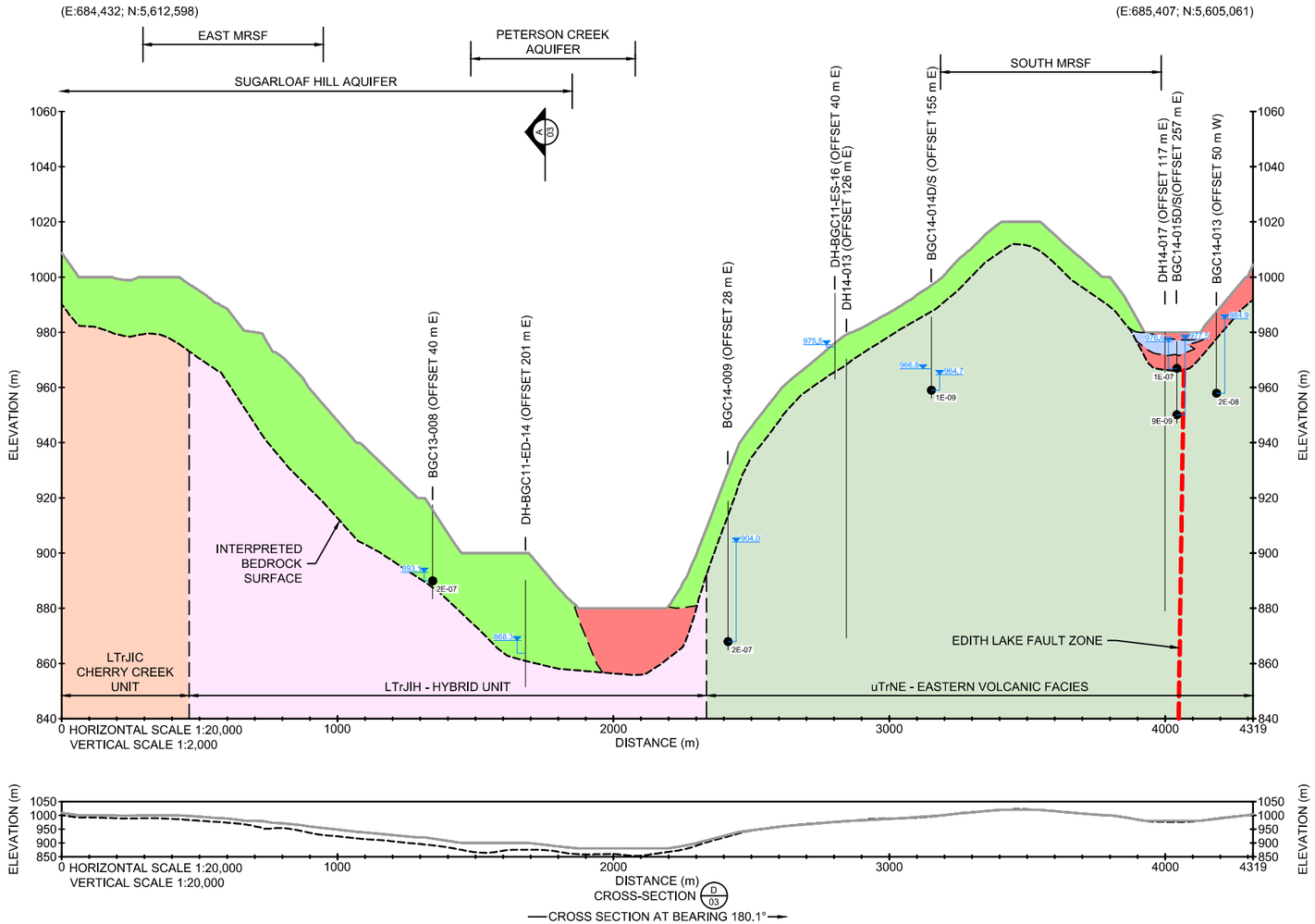
LOOKING EAST



LEGEND

- 2E-08 — ESTIMATED HYDRAULIC CONDUCTIVITY (m/s)
- 901.6 — AVERAGE ANNUAL WATER LEVEL
- INTERPRETED BEDROCK SURFACE
- ESTIMATED LITHOLOGY CONTACT
- OPEN PIT OUTLINE[1]

3D MODEL GEOLOGY AND STRUCTURE[2]

- MODELED LITHOLOGY CONTACT
- FAULT

LATE TRIASSIC TO EARLY JURASSIC IRON MASK BATHOLITH

- LTrJIS - SUGARLOAF UNIT DIORITIC INTRUSIVES
- LTrJIH - HYBRID UNIT

UPPER TRIASSIC NICOLA GROUP

- uTrNE - EASTERN VOLCANIC FACIES
- LTrNop - PICRITE

REGIONAL STRUCTURE[3]

- EDITH LAKE FAULT ZONE

REGIONAL GEOLOGY[4]

ECOENE - KAMLOOPS GROUP

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LATE TRIASSIC TO EARLY JURASSIC IRON MASK BATHOLITH

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UPPER TRIASSIC - NICOLA GROUP

- uTrNE - EASTERN VOLCANIC FACIES
- uTrNmL - METAMORPHIC ROCKS

INTERPRETED SURFICIAL GEOLOGY[5]

POST-FRASER GLACIATION

- ANTHROPOGENIC MATERIAL

FRASER GLACIATION - KAMLOOPS DRIFT

GLACIOLACUSTRINE ENVIRONMENT

- GLACIOLACUSTRINE COMPLEX
- COLLAPSED GLACIOLACUSTRINE DEPOSITS

GLACIOFLUVIAL ENVIRONMENT

- KETTLE TERRACE DEPOSITS
- RILL COMPLEX

GLACIAL TILL, MORAINAL DEPOSITS

- GLACIAL TILL, MORAINAL DEPOSITS

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SCALE 1:20,000
250 0 250 500 750
METRES

SCALE:	AS SHOWN
DATE:	AUG 2015
DRAWN:	WKL
CHECKED:	CK
APPROVED:	TWC

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: KGHM AJAX MINING INC.

PROJECT: AJAX PROJECT
BASELINE GROUNDWATER HYDROLOGY ASSESSMENT

TITLE: CROSS SECTION D

PROJECT No.: 1125007-03

DWG No.: 08D

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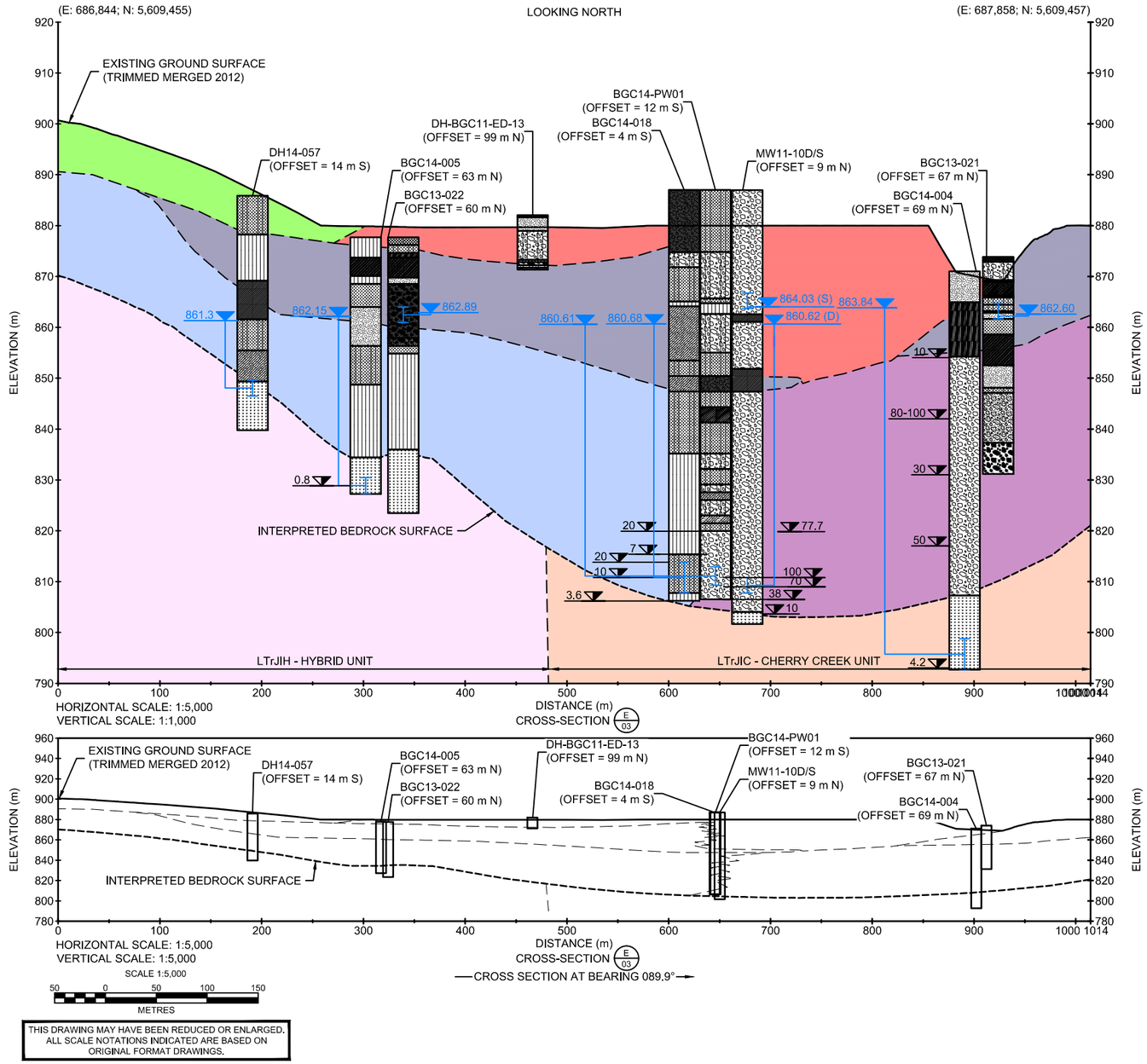

LEGEND

- SCREEN INTERVAL
- AIR LIFT TEST RESULTS (US gpm)
- STATIC WATER LEVEL (m asl, FEB 15, 2015)
- INTERPRETED BEDROCK SURFACE
- ESTIMATED LITHOLOGY CONTACTS

DRILL HOLE LITHOLOGY LEGEND[1]

TOPSOIL
- TOPSOIL

GRAVEL
- WELL GRADED (GW)
- POORLY GRADED (GP)
- SILTY (GM)
- CLAYEY (GC)

SAND
- WELL GRADED (SW)
- POORLY GRADED (SP)
- SAND AND GRAVEL (SPG)
- SILTY (SM)
- CLAYEY (SC)

SILT
- LOW PLASTIC (ML)
- HIGH PLASTIC (MH)

CLAY
- HIGH PLASTICITY (CH)
- MEDIUM PLASTICITY (CI)
- LOW PLASTICITY (CL)
- CLAY AND GRAVEL (CLG)

BEDROCK
- IRON MASK HYBRID

INTERPRETED SURFICIAL GEOLOGY[2]

FRASER GLACIATION - KAMLOOPS DRIFT

GLACIOLACUSTRINE ENVIRONMENT
- GLACIOLACUSTRINE COMPLEX
- COLLAPSED GLACIOLACUSTRINE DEPOSITS

GLACIOFLUVIAL ENVIRONMENT
- KETTLE TERRACE DEPOSITS
- RILL COMPLEX

GLACIAL ENVIRONMENT
- GLACIAL TILL, MORAINAL DEPOSITS

REGIONAL GEOLOGY[3]

LATE TRIASSIC TO EARLY JURASSIC - IRON MASK BATHOLITH
- LTrJIC - CHERRY CREEK UNIT
- LTrJIH - HYBRID UNIT

THIS DRAWING MAY HAVE BEEN REDUCED OR ENLARGED. ALL SCALE NOTATIONS INDICATED ARE BASED ON ORIGINAL FORMAT DRAWINGS.

NOTES:
1. DRILL HOLE DATA COMPILED FROM BGC, KAM, KP, KCB, GOLDER AND WRBC. SEE APPENDIX B AND C FOR DETAILED LITHOLOGICAL DESCRIPTIONS.
2. INTERPRETATION OF SURFICIAL STRATIGRAPHY BASED ON BOREHOLE DATA FROM DRILLING INVESTIGATIONS FOR THE AJAX PROJECT COMPLETED BY BGC, KAM, KP, KCB, GOLDER AND WRBC, AND ON SURFICIAL MAPPING BY FULTON (1975), KEYSTONE (2008) AND KP (2014).
3. AFTER MASSEY ET AL (2005).
4. BOREHOLES SHOWN ON THE UPPER SECTION (5X VERTICAL EXAGGERATION) ARE OFFSET TO ALLOW PRESENTATION OF LOGGED UNITS. CORRECT PROJECTIONS ARE SHOWN ON THE LOWER SECTION (NO VERTICAL EXAGGERATION).
5. BOREHOLE ELEVATIONS HAVE BEEN GEOREFERENCED TO AIRBORNE IMAGING LIDAR PRODUCED FOR KGHM AJAX MINING INC. IN APRIL AND MAY OF 2013.
6. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.
7. THIS DRAWING MUST BE READ IN CONJUNCTION WITH BGC'S REPORT TITLED "AJAX PROJECT BASELINE GROUNDWATER HYDROLOGY ASSESSMENT," AND DATED AUGUST 2015.
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SCALE:	AS SHOWN
DATE:	AUG 2015
DRAWN:	AH
CHECKED:	CK
APPROVED:	TWC

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: KGHM AJAX MINING INC.

PROJECT: AJAX PROJECT
BASELINE GROUNDWATER HYDROLOGY ASSESSMENT

TITLE: CROSS SECTION E - INTERPRETIVE GEOLOGY OF THE PC AQUIFER IN THE PUMPING TEST LOCATION

PROJECT No.: 1125007-08

DWG No.: 8E

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